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Proceedings of the 12th European Conference on eGovernment

**Institute of Public Governance
and Management
ESADE Barcelona
Campus Sant Cugat
Barcelona, Spain**

14-15 June 2012

Volume One

Edited by

**Mila Gascó
Institute of Public Governance
and Management, ESADE
Barcelona, Spain**

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Preface

These proceedings represent the work of authors at the 12th European Conference on e-Government (ECEG 2012).

The Conference this year is being hosted by the Institute of Public Governance and Management, ESADE Barcelona, Spain. The Conference Chair is Dr Tamyko Ysa, and the Programme Chair is Dr Mila Gascó, both from the Institute of Public Governance and Management, ESADE.

The opening keynote address is given by Àlex Pèlach who is Director General, Head Office of Processes and E-Administration for the Autonomous Government of Catalonia. The topic of this presentation is "*E-Simplicity*". The second day of the conference is opened by Miguel A. Amutio, Directorate General of Administrative Modernization, Processes and Promotion of E-Administration at the Spanish Ministry of Finance and Public Administration.

ECEG brings together practitioners, Government officials and researchers in the area of e-Government from around the world. Participants are able to share their research findings and explore the latest developments and trends in the field which can then be disseminated in the wider community.

With an initial submission of 228 abstracts, after the double blind, peer review process there are 94 academic papers, 8 PhD papers, 5 Work-in-Progress papers and 6 non-academic papers published in these Conference Proceedings. These papers represent research from more than 40 countries including Australia, Austria, Belgium, Bosnia and Herzegovina, Canada, Costa Rica, Croatia, Egypt, Estonia, Finland, Germany, Ghana, Greece, India, Iraq, Ireland, Italy, Jordan, Latvia, Lithuania, Luxembourg, Malaysia, Mexico, Morocco, Portugal, Republic of Macedonia, Romania, Saudi Arabia, Serbia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Tanzania, Thailand, The Netherlands, Turkey, United Arab Emirates, UK, USA and Zimbabwe. This will ensure a very interesting two days.

Selected papers will be published in special issues of the Electronic Journal of e-Government (www.ejeg.com) and the Journal of E-Government Studies and Best Practices.

I hope that you have a stimulating conference, and enjoy your time in Barcelona.

Mila Gascó
Programme Chair
June 2012

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Biographies of Conference Chairs, Programme Chairs and Keynote Speakers

Conference Chair



Dr. Tamyko Ysa holds a Ph. D. in political science and a Master in Public Administration and Public Policy. She is a lecturer at the Institute of Public Governance and Management of ESADE in Spain. She has acted as consultant to various public administrations. The institutions for which she has worked include several departments of the Autonomous Government of Catalonia, the Barcelona City Council and County Council, and a large number of local governments and public companies. She is the Principal Researcher of the Research Group for Leadership and Innovation in Public Management (GLIGP).

Programme Chair

Dr. Mila Gascó holds a MBA and a Ph. D. in public policy evaluation. She is a researcher at the Institute of Public Governance and Management of ESADE in Spain. She also has a lot of consulting experience on the information and knowledge society. For seven years, she was a senior analyst at the International Institute on Governance of Catalonia. She has a wide teaching experience as well as a broad researching experience. She has taken part in numerous national and international seminars, she has published both in Spanish and English and she has supervised some Ph. D thesis.



Keynote Speakers



Alex Pèlach Pàniker is Director-general of Processes and Electronic Administration. In 1983, when he finished his studies in Computing, he joined a local company in software development. In the following years, he reached higher quotas of responsibility until arrived at the technical direction of an important multinational consulting company. In 2011 he joined the Catalan Administration, where he is responsible for the promotion of administrative simplification and electronic administration. He is a member in several committees and boards dealing with issues of data protection, local administration, TIC policies, and e-governance policies.

Miguel A. Amutio CISA, CISM, CRISC graduated in Computer Science at Deusto University (Bilbao) in 1988. He joined the Ministry of Public Administrations in 1995. Currently he is Head of Area within the DG Administrative Modernization, Procedures and Promotion of eGovernment in the Ministry of Finance and Public Administrations of Spain. He coordinates the development of the National Interoperability Framework (Royal



Decree 4/2010), and its Technical Interoperability Regulations, and of the National Security Framework (Royal Decree 3/2010) of Spain. He is member of the Committee of the ISA Programme. He has been member of the managing committees of the EU Programmes IDA II (1999-2004) and IDABC (2005-2009). He is National Coordinator of Spain for the transeuropean network sTESTA. He is president of AENOR AEN GET 13 Risk Management. He is member of AENOR CTN71/SC 27; of the management committee of the Arrangement on the Recognition of Common Criteria Certificates In the field of Information Technology Security (CCRA); of the OECD WPISP (Working Party of Security and Privacy); the Advisory Committee of CENATIC. His domains of expertise include: Cross border eGovernment services, eGovernment Interoperability, eGovernment IT security, open standards, open source software.

Mini Track Chairs



Dr Carl Adams is a Principal Lecturer and Researcher in the School of Computing, University of Portsmouth, UK. He has over a decade of professional experience in the computer industry as a Software Engineer and consultant before going into academia. He is an active researcher with interests in e/m-commerce, e/m-government, e/m-payment systems and mobile information systems. He has current PhD students in e/m-commerce and e/m-government. He has published over 80 referred research papers, several book chapters and one book. His PhD is from Southampton University, UK, in the field of Information Systems.

Tom Collins lectures in International Tax and Advanced Tax in the B.A. (Hons.) in Applied Taxation and in Wealth Management for the MSc (Computational Finance) at the National Centre for Taxation Studies, University of Limerick. Tom has over 25 years experience with Big-4 tax practices in Ireland and New Zealand. Prior to joining the University of Limerick, Tom was a Tax Director with Deloitte specialising in international tax, real estate and wealth management. Tom is NCTS director since September 2009.



Bruno de Vuyst teaches in Antwerp, Barcelona, Brussels and Valencia. He is a deputy judge in the Brussels commercial tribunal and of counsel to a Brussels law firm; in addition he is an elected member of the general assembly of Flemish Bar Associations, representing the Brussels Bar, and a member of the scientific committee of the Institute for judicial training. He is secretary-general of the spin-off fund of the Vrije Universiteit Brussel and a board member of several spin-offs in the life sciences and new materials. He has published books and articles on IP and financial law; he is also a playwright and novelist.

Mary Griffiths is an Associate Professor in the Discipline of Media at the University of Adelaide. She writes on media and e-democracy, e-learning, media ethics, and digital creative praxis. Recently completed: a co-designed comparative pilot study, 'Young People's Political Participation (Adelaide and Seoul)'. Currently she teaches *Media Democracies and E-Participation*, using a role-play on digital information flows. The e-SIM is located in a fictional polity, Incognita, which bears more than a passing resemblance to Australia at the time of Gov 2.0, and *wikileaks*.



Carlos E. Jiménez holds a MSc on the Information Society, a Postgraduate diploma on Information Systems Management and a Computer Engineering degree. Nowadays he works at the e-justice project of the Justice Department of the Autonomous Government of Catalonia, Spain. His main interests include information systems, e-governance or interoperability and, in these areas, he has carried out international training and consulting work for organizations such as the CLAD, the Government of Brazil, the European Commission, the Organization of American States, or the Pompeu Fabra University, in Spain. He belongs to relevant technology associations as the ACM or IEEE Technology Management Council. He is the chairman of the Spanish chapter of the latter.

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Pat Molan is a Principal Officer with the Irish Revenue Commissioners and Limerick District Manager. Pat has worked with Revenue for almost thirty years having worked in a number of government departments previously. Pat has been centrally involved in the delivery of new and innovative IT solutions that have helped transform the Irish Revenue Commissioners into an organisation that is internationally regarded as the flagship for e-Government in the Irish Public Service

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Carl Adams is a Principal Lecturer in the School of Computing at the University of Portsmouth, Carl Adams is an active researcher, engaged in investigating information systems, mobile information systems and technologies and the impact of technology on people, organisations and society.

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Mohammed Alhusban is a PhD student and active researcher in school of computing at University of Portsmouth, UK. He Received MSc in Electronic Business from University of Huddersfield (2004). He has worked alongside consultant for several eGovernment systems in Middle East countries. He is Currently involved in eGovernment implementation using Enterprise Architecture frameworks.

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Determinants of the use of eGovernment Services in Outlying Regions: A Multi-Method Approach

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Abstract: Evidence suggests that citizens outside larger urban centers are less likely to use the various functionalities of eGovernment. Thus, the purpose of this manuscript is to identify factors that influence the use of eGovernment services in outlying regions in the Province of Quebec (Canada). The study is based on the theory of planned behaviour (TPB) and on its attitude-related variables. We executed a triangulated study based on an empirical survey carried among 1,587 citizens living in four selected outlying regions of Quebec, and 2 focus groups held in each of the four regions involving respectively users and non-users of eGovernment. Our results show that attitude have a significant positive effect on the intention to use eGovernment services. Attitude is in turn influenced by perceived usefulness, perceived ease of use, perceived risk and trust. Evidence collected from focus group sessions emphasizes the underlying dimensions of these determinants as perceived by users and non-users.

Keywords: eGovernment, outlying regions, TPB, attitude, intention, Quebec

1. Introduction

eGovernment has been introduced to public administration in the late 1990s. This technology was an outcome of the growing enrolment in e-commerce and e-business (Moon, 2002). EGovernment is defined as “the production and the delivery of government services through IT applications” (Moon, 2002: 425). eGovernment serves three purposes: information access, communication and transaction services (Choudrie et al., 2005).

With the advent of new information technologies, governments have begun to perceive citizens as customers and value the expression of their satisfaction (Evans & Yen, 2006). In this effort, several studies have revealed that citizens outside larger urban areas are less engaged in the use of the various functionalities of eGovernment (Choudrie et al., 2005; Goldfinch et al., 2009; Previtali & Bof, 2009). In order to address this issue, our research objective was to determine what variables could promote or influence the use of government online services among the populations located outside larger urban centres, more specifically in the Province of Quebec (Canada).

As far as we know, no large scale investigation has ever been performed to capture the idiosyncrasies of citizens in outlying regions in regards to the determinants of the use of eGovernment. The specificity of the socio-demographic profile of outlying regions leads us to believe that their citizens may be influenced by a specific range of determinants in regards to their intention to use eGovernment services. For example, the socio-demographic profile of Northern Quebec compared to the rest of the Province is distinguished essentially by small-sized yet younger local communities, a lower proportion of seniors under 65 years-old, a lower proportion of youths over 20 obtaining college and university degrees, a higher concentration of jobs in the mining, forest and agriculture industries, and greater presence of aboriginals (Emploi Québec, 2009).

Given the large number of explicative variables proposed in literature, we decided to focus on those that were attitude-related. The attitude of citizens in outlying regions towards eGovernment services may be sensitive to some aspects of the technology rather than others since their particularities may present specific needs and expectations.

This paper is organized as follows. The first section will present the popular theoretical models that propose factors likely to influence the intention to use public online services. Then, the research framework is discussed followed by the presentation of the results of the empirical survey and the evidence collected in focus groups. The last section will present the concluding remarks and the future avenues for research.

2. Related work

Different theoretical models have been proposed to explain the cognitive determinants of eGovernment use, the most popular are the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), the Diffusion of Innovation model (DOI), the Trust-based models and the Theory of Planned Behaviour (TPB).

According to the Technology Acceptance Model (TAM), two factors influence one's intention to use a technology: perceived usefulness and perceived ease of use (Carter & Bélanger, 2004). However, TAM ignores one's emotional choices and attitudes, and focuses on technology acceptance rather than on technology use. The Unified Theory of Acceptance and Use of Technology (UTAUT) model, a modified version of TAM, differentiates the intention to use from actual use (van Dijk et al., 2008). This model emphasizes four constructs that would affect one's intention to use, i.e., effort estimation, performance expectation, social influence (the degree to which a person believes that other people think he or she should use a new technology), and the conditions that facilitate use (Carter & Weerakkody, 2008).

The Diffusion of Innovation (DOI) model also attempts to explain one's intention to adopt new technologies (Carter & Bélanger, 2005). A technology diffuses at a speed determined by (a) its relative advantage, which is perceived in relation to preceding technologies, (b) its perceived complexity, (c) its compatibility with the potential user's values, beliefs, and needs, and (d) its perceived image (Carter & Bélanger, 2005; Lean et al., 2009). According to Carter & Weerakkody (2008), relative advantage and perceived complexity are quite similar to the concepts of perceived usefulness and perceived ease of use in the TAM along with effort estimation and performance expectation in the UTAUT.

Other models introduce trust as an important use determinant. Research on trust was initially conducted in studies on e-commerce (Tassabehji et al., 2007). Trust occurs at two levels: trust in technology and trust in the perceived integrity and reliability of the agent who collects and uses the data (Bélanger et al., 2002). Such trust is expressed towards the political system (political regime), certain institutions or organizations, and political staff (Goldfinch et al., 2009).

The Theory of Planned Behaviour (TPB) incorporates the concept of intention. A person's decision to use a technology can thus be assessed in contexts where use is mandatory (Lean et al., 2009). According to this framework, intention to use eGovernment depends on three groups of factors: attitude towards the technology, subjective norms, and perceived control of one's behaviour. These are in turn influenced by other factors (Hung et al., 2006; Hung et al., 2009):

- Factors influencing attitude: perceived usefulness, perceived ease of use, perceived risk, training provided, trust, personal innovativeness, and compatibility (in relation to one's experience with preceding technologies, one's values, and one's current needs),
- Factors influencing the subjective norm: external influence (influence from information), interpersonal influence (normative influence), and
- Factors influencing perceived control of one's behaviour: one's self-efficacy and facilitating conditions (time and money).

3. Conceptual framework

Among the large variety of variables which are likely to influence one's intention to use eGovernment in outlying regions, we observe that attitude-related variables are at the intersection of different models proposed in the literature. Also, a better understanding of attitudinal effects can permit the development of appropriate communication and incentive strategies to reduce usage barriers. Our conceptual framework is therefore based on five attitude-related variables proposed in the TPB model, i.e. perceived usefulness, perceived ease of use, perceived risk, personal innovativeness and trust. Compared to the TAM model, the TPB provides more explanatory factors for the intention to use a technological application. The TPB is a more complex model arguing for several independent variables that could capture various aspects of an individual's belief. In addition, the TPB, unlike the TAM, considers only beliefs that are specific to the given system, thus more accurate information could be obtained (Chuttur, 2009). Furthermore, the TAM ignores the influence of the attitude variable which could have important effects on system use (Yang & Yoo, 2003). Bogozzi (2007) questioned the theoretical strength of the intention-actual use link and notes that intention is not representative of

actual use because the time period between both events is full of uncertainties. Thus, a person's intention could be subjected to further reflection which might direct the person to reformulate his intention and behave accordingly. In light of these limitations, we decided to apply the TPB as the primary reference model in this study. Compared to the original mapping of the TAM, our conceptual framework introduces the attitude variable as well as other cognitive factors included in the TPB, i.e. perceived risk, personal innovativeness and trust. Unlike the TAM model which treats actual use as the terminal goal, our model proposes intention instead.

Table 1: Recapitulation of attitude-related explicative factors

Attitude-related variables in TPB	Perceived usefulness	TAM; UTAUT; DOI
	Perceived ease of use	TAM; UTAUT; DOI
	Perceived risk	
	Compatibility	DOI
	Personal innovativeness	
	Trust	Trust-based models

In line with the UTAUT model, our research model includes moderating socio-demographic variables. Some studies show that eGovernment users are generally men from urban areas with higher educational levels and higher incomes (Goldfinch et al., 2009). For instance, there is a positive correlation between use of online public services in Australia and New Zealand and ethnicity, educational level, income, and age. The correlations were stronger for ethnicity and education level (Thomas & Streib, 2003). In light of this evidence, we expect that the effect of attitude on intention to use online government services outside the large urban centres is likely to be higher among citizens who are male, richer, more educated, employed, and younger.

Our research model (see figure 1) therefore integrates the assumptions of two theoretical models, namely the TPB and the UTAUT. Along with the TPB model, our model assumes that citizen's attitude towards eGovernment is determined by five dimensions, i.e. perceived usefulness, perceived ease of use, perceived risk and personal innovativeness. According to the TPB, as the attitude of an individual about a new technology scores higher, this is likely to favour the intention to use it. The TPB states also that individual's attitude is enhanced by a group of perceptual variables (Hung et al., 2006; 2009). First, our model considers that if the usefulness of the new technology is reinforced in the mindset of potential users, this is likely to raise the positive attitude towards it. Usefulness is assessed in terms of expected performance, productivity, effectiveness as well as effort and time savings. The inclusion of the ease of use variable implies that when potential users perceive easiness in the use, the manipulation and the mastery of the different functionalities of a new technology, they would develop a more favorable attitude towards it.

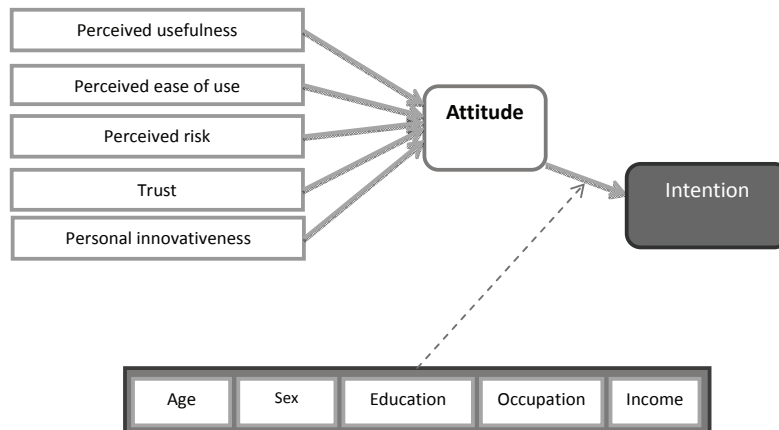


Figure 1: Conceptual framework

According to related theory, our model stresses that higher levels of perceived risk could lower the attitude levels about eGovernment. Risk is associated to any perceived loss or mistake due to the use of a new technology.

As trust increases, attitude is expected to be higher. Trust is expressed towards the reliability of the technology even though no assistance is provided. Finally, we assume that any increase in personal innovativeness would result in better attitudes about eGovernment. The former is related to the person's willingness to try new things and to be challenged by ambiguities and unsolved problems.

Personal innovativeness is also related to the preference for originality in thoughts and behaviour (Hung et al., 2006).

Below we translate these assumptions about the subsequent influences of attitude on intention to use eGovernment into research hypotheses:

H1: perceived usefulness increases attitude

H2: perceived ease of use increases attitude

H3: perceived risk increases attitude

H4: trust increases attitude

H5: attitude increases intention

Our model also accounts for the moderating effects of socio-demographic variables intervening in the relationship between attitudinal variables and the adoption of eGovernment services. While Lean et al. (2009) include gender and age in their conceptualization, we added other socio-demographic dimensions related to education level, occupation (or not), and income. Based on previous evidence, we expect that the effect of attitude on the acceptance of eGovernment is higher among youngmen, university graduates, job holders and high-income citizens. This is how moderating socio-demographic effects are formulated in the model:

- The influence of *attitude* on *intention* decreases when *age* increases
- The influence of *attitude* on *intention* is higher among men
- The influence of *attitude* on *intention* is higher among university degree holders
- The influence of *attitude* on *intention* is higher among job holders
- The influence of *attitude* on *intention* decreases when *income* increases

4. Method

To fulfill our research agenda, we used a multi-method approach which couples quantitative with qualitative data collection. The quantitative part of the research was based on a survey using codified questionnaires filled by 1587 citizens located in four regions in the province of Quebec (Canada): Côte-Nord, Saguenay-Lac-Saint-Jean, Abitibi-Témiscamingue, and Bas-St-Laurent. Participants were Quebecers aged over 18. The design of our questionnaire was based on the one used by Hung et al. (2006)'s that measured the core variables of the TPB model. A factor analysis was conducted in order to validate these items and constructs for each variable.

Respondents were questioned via web and phone surveys and were randomly picked from a nationwide database. The period of the field research lasted from January through May 2011. To stimulate responses, a reminder was sent out 2 weeks later by e-mail or by a phone call. The response rate reached 40%.

Table 2: Sample profile by region

Usage	Region				
Frequence Row percentage	Bas St-Laurent	Saguenay	Abitibi	Côte Nord	Total
Non-users	234 30.12	293 37.71	149 19.18	101 13.00	777
Users	237 29.26	291 35.93	172 21.23	110 13.58	810
Total	471	584	321	211	1587

Our sample is composed of 56,84% men and 41,16% women. The largest proportion of respondents has a primary or secondary education level (42%), versus 32% of collegial level of education and 26% attending or graduated from the university. 40,76% of participants are aged between 35 and 54 years, against 33,58% aged over 55 years and 25,66% aged under 34 years. The distribution of participants on the income scale is rather balanced as shown in the table below:

Table 3: Distribution of participants according to their income

Income	Total	Percentage
39,000\$CAD and less	442	27,85%
40,000\$CAD to 79,000\$	558	35,16%
80,000 and over	326	20,54%
NA/Refusal	261	16,45%
Total	1587	100%

Finally, our sample is composed of 55,16% of job-holders versus 44,84% of unemployed people. The latter category comprises jobless people, students and retirees.

A qualitative investigation intended to explore the underlying dimensions of significant explicative variables, with particular attention given to attitude components. In this regard, eight focus groups served the explorative part of our study. Two sessions were held in each region, i.e. one focus group with users of eGovernment and one focus group with internet users yet non-users of eGovernment. Participants in focus group sessions were selected from the pool of people previously surveyed in the survey. The focus groups were organized in four cities corresponding respectively to the four aforementioned regions: Rimouski, Sept-Îles, Chicoutimi and Rouyn-Noranda. An interview guide was set with open questions to fit the explorative nature of the survey. Participants in the focus groups were first asked about their internet skills and usages, then about the public online services that they know and/or they master the most. The following questions intended to stimulate personal reflections about issues related to the attitudinal determinants that proved significant in the survey. The questions explicitly called on participants to provide examples in order to highlight their past experience or their perceptions about eGovernment services. Participants were also asked to make comparisons between different means to access public services. All group interviews were recorded and transcribed. Each participant in the focus groups obtained a compensation of \$60CAD.

Data analysis was conducted in three steps. The validation of our hypothesis regarding determinants of attitude was done using a multinomial regression. Then, a Student test was applied in order to assess the influence of Attitude on the intention to use eGovernment services. This procedure consists in a univariate explorative analyses that aims to construct a causal model which is adapted to outlying regions. Structural equation modeling (SEM) is applied in a subsequent stage in order to conduct a multivariate analysis to confirm the effects of attitudinal factors on intention to use eGovernment services and to determine whether the theoretical model fits our data.

5. Results

5.1 Descriptive statistics

The proportion of users increases as the education level is higher. The data shows that 64,65% of people attending or graduated from universities are users of eGovernment services. This proportion decreases to 55,64% for college level and 39,46% for primary/secondary level. Furthermore, the age group of 35-54 years has the highest proportion of users, with a percentage of 61,05%, followed by the age group under 34 (46,68%) and those over 55 years (42,21%). Regarding gender, there are more users among men (53,28%) compared to women (49,33%). However, if we probe into these proportions by region, we find that women comprise more users of eGovernment compared to men in Abitibi-Témiscamingue (56,68% vs 49,25%) and Côte-Nord (52,85% vs 51,14%).

Table 4: Distribution of users by gender and region

Gender	Bas-St-Laurent		Saguenay		Abitibi		Côte-Nord	
Frequence Row Percentage	N-U	U	N-U	U	N-U	U	N-U	U
Men	98 47.12	110 52.88	111 43.53	144 56.47	68 50.75	66 49.25	43 48.86	45 51.14
Women	136 51.71	127 48.29	182 55.32	147 44.68	81 43.32	106 56.68	58 47.15	65 52.85

*N-U : Non-Users; U : Users

The proportion of users increases as income rises. More specifically, the usage of eGovernment is 64,11% among participants who earn an annual income over \$80,000CAD. This proportion is 55,38%

for those located in the \$40,000 to \$79,000CAD group and 45,7% for individuals with an annual income less than \$39,000CAD. Finally, there are more users among job holders (60,39%) than jobless respondents (39,91%).

5.2 Empirical analysis

Validation of the determinants of Attitude

In order to study the relationship between continuous variables, we calculated the Pearson correlation (r). Correlation analysis would allow us to measure the linear link between attitude and other independent variables, i.e. perceived usefulness, perceived ease of use, perceived risk and trust. Personal innovativeness was dropped from the basic model because of its limited Cronbach alpha that scores under the threshold of 0.6. As noticed in table below, all variables are significant at the .01 threshold. According to this analysis, there is a positive correlation between attitude and perceived usefulness; perceived ease of use and trust. In addition, there is a negative correlation between attitude and perceived risk.

Table 5: Pearson coefficients

	Attitude
Perceived usefulness	0.59609
Perceived ease of use	0.58361
Perceived risk	-0.58570
Trust	0.61823

Afterwards, we conducted a multivariate analysis of concurrent effects exerted by multiple independent variables on attitude:

$$\text{Attitude} = \beta_0 + \beta_1 (\text{usefulness}) + \beta_2 (\text{ease of use}) + \beta_3 (\text{Risk}) + \beta_4 (\text{trust}) + \epsilon$$

Then, the variation of attitude is predicted by accounting for correlations between independent variables. The table below provides the estimations of β parameters for each independent variable. The results show that all these variables are significant. The research hypotheses are therefore supported by these results.

Table 6: Estimation of parameters

Variable	Estimation of parameters	t value	Threshold
β_0	1.84912	15.43	<.0001
Perceived usefulness (β_1)	0.25871	10.87	<.0001
Perceived ease of use (β_2)	0.22656	10.46	<.0001
Perceived risk (β_3)	-0.31300	-14.91	<.0001
Trust (β_4)	0.17987	7.16	<.0001

We consider that the R-square of the model is acceptable (0.569), which means that 57% of the variation of attitude is explained by the independent variables of the model. Analysis of residuals confirms that the homogeneity hypothesis is met. Given the high number of observations, the power of the normality test is very strong. Thus, the Shapiro-Wilk normality test applied on our data is rejected. However, the coefficients of skewness and kurtosis are very close to those of a normal distribution, and regression analysis is robust enough to non-normality. Therefore, we can consider that our results are valid. No problem of multi-co-linearity has been detected.

Validation procedure of the determinants of Intention

We proposed to study the effect of Attitude on Intention by undertaking a Student test. The results of this test show that Attitude has a significant influence on the intention to use eGovernment services. In the table below, we observe that the mean score of Attitude among citizens who intend to use eGovernment is significantly higher than the mean score registered for citizens with no intention to use this technology (2.81 vs 3.89)..

Table 7: Attitude and intention

Intention	N	Mean	Standard deviation
NO	708	2.8145	0.8889
YES	820	3.8880	0.8259
Diff (1-2)		-1.0735	0.8557

Method	Variances	t value	Pr > t
Pooled	Equal	-24.45	<.0001

Regarding moderating effects exerted by socio-demographic variables, the analysis shows that none of these variables has a significant influence in the causal relationships between intention and independent variables. There is therefore no support for our hypotheses related to socio-demographic effects.

Structural equation modeling

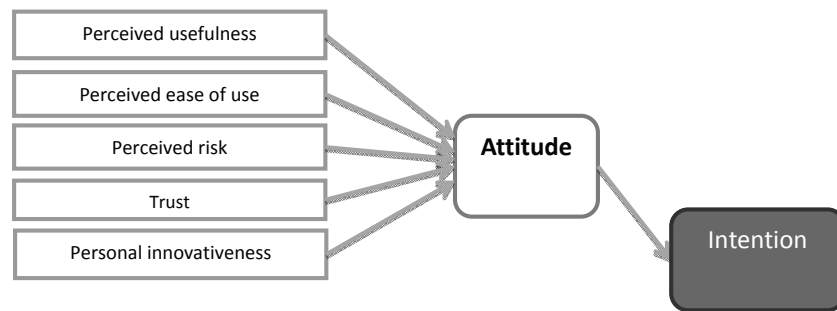


Figure 2: Theoretical model

We carried a SEM analysis in order to confirm the subsequent causal effects between attitude-related variables and intention as represented in the figure 2 above. The results of SEM analysis show that the model does not fit our data. The *p-value* of the test is under 0.5.

5.3 Determinants of attitude as discussed in focus groups

The results of the survey allowed us to identify the most important variables of citizen's attitude towards eGovernment services in outlying regions of Quebec and to explore them in the focus group sessions according to two perspectives: users and non-users.

Perceived usefulness

▪ Users

Users perceive the usefulness of eGovernment at numerous levels. First, they consider that it provides them enhanced time flexibility which accommodates those with atypical time schedules. Using Internet to tap into public services allows more mobility for some users who possess mobile electronic devices such as *iPhones* and more rapidity in transaction processing, communication and access to information. Some participants assert that the volume of information available on the Internet is larger compared to other means and represents an effective way to obtain information. According to others, online government information is likely to strengthen their self-learning about public policies. Regarding communication, the use of eGovernment helps users to get around the problem of encumbered phone services. Moreover, it was noted that information obtained by email from governmental bodies is more accurate and can be archived. For participants, online transactions with government are well-structured with the possibility to follow up orders. They are also useful because of the variety of payment modes they offer.

▪ Non-users

For non-users, eGovernment usefulness is related to (a) the possibility of a better organization of their documentation with the government; (b) time flexibility and (c) time saving. Other participants do not perceive the usefulness of eGovernment in providing easier access to public services as compared to

more traditional means. Two non-users argue that they prefer going in person to government agencies due to their closeness and the absence of traffic in their neighborhood.

Perceived ease of use

- Users

Users participating in our focus groups associate the perceived ease of use to the easiness of personal data transmission and the user-friendliness of government websites. Other participants note however some drawbacks likely to impair the ease of use. Regarding easiness of access to information, users mention the complexity of the text - more specifically public regulation – and the density of information stored online which lacks a suitable structure. The existence of such drawbacks is likely to inhibit the access to specific information and to raise the alternative of the phone for this purpose. The use of the phone helps citizens in outlying regions to obtain more adapted information about their specific requests. Contrary to the phone, some users emphasize the difficulty to find information on specific topics on the government websites. A conclusive search is only possible when using specific keywords, which are not always easy to identify.

Users point out the lengthiness of obtaining responses through email as a prominent drawback related to communication with public administration. In relation to online transactions with governmental agencies, participants discussed the lengthiness and complexity of the registration procedure as well as the difficulty to memorize various passwords.

- Non-users

A large number of participants mention that the phone remains a privileged way to access public services in order to avoid spending significant time trying to grasp long and complicated information provided on public websites. Other non-users note the lengthiness of different texts and advocated more adapted text load and visual attractiveness.

Perceived risk

- Users

Even though the general perception regarding the security of online transactions with government is positive, some participants remain concerned by the privacy of their personal information due to revelations in the media about the electronic assaults against public servers. The phone is generally viewed as a more secure means of transaction with government because the citizen knows exactly to whom his information is delivered. A participant from Rimouski noted that the risk that he perceived was not related to the process of the transaction itself but more related to the extent to which government databases are protected.

- Non-users

Non-users participating in our focus groups highlighted the potential risks inherent to eGovernment as related to the necessity to download specific applications and to memorize different passwords. In addition, the unavailability of some web pages as well as bugs and viruses were pointed out in the discussions.

Trust

- Users

Participants in focus group sessions portray information available online as more credible and more accurate. In two situations reported by panelists, civil servants responding on the phone delivered loose and expeditious information. In other situations, they misunderstand the information needs formulated by citizens. Contrary to the phone, the use of Internet is regarded by some of participants in the study as a more controllable channel of information. These people state that information on the public websites is more explicit which prevents misleading perceptions and raises trust towards online public services as a credible and precise source of information.

- Non-users

For one of the non-users, ambiguity of information delivered in some public websites triggers confusion and frustration. To fulfill information requests, he claims that human interaction is a must. Human presence seems to be a condition likely to enable this non-user to trust eGovernment

services. Another participant noted that the human assistance on the phone for instance helps her to obtain “bonuses” of information on specific advantages such as those stated in the fiscal regulation. According to other views, talking with civil servants in person or on the phone allows also to ask additional questions on the subject of interest.

6. Conclusions

The findings of this large-scale triangulated study confirm that attitude is a significant determinant of the intention to use public online services in outlying regions of the province of Quebec. These results allow us to draw an overview of what determines the attitude of citizens located in outlying regions of Quebec towards governmental online services. The most salient contribution of this research lies in the in-depth exploration of what characterizes each of the attitude predictors either for users and non-users. Four predictors were proved significant in this study, namely perceived usefulness, perceived ease of use, perceived risk and trust. The usefulness of public online services is perceived in terms of commodity, flexibility, celerity, mobility, learning and better follow-up of communications and transactions with government bodies. Ease of use is resented in relation with the comprehensibility and the readability of the content as well as with the proper organization of the information. Perceived risk is linked to the security of online transactions with public administration along with the imperfections of the technology (bugs, viruses, and break). Finally, trust in eGovernment services raises as this technology provides more reliable information to users. The focus group sessions highlighted the importance to evolve towards a user-centered approach in order to reduce the perceived barriers inhibiting the intention to use eGovernment. Such an approach is based on customization, interactivity and user-friendliness (use of images, videos, tutorials, virtual companions, alleviated text, etc.). The application of this approach is likely to encourage the intention to use and to appropriate public online services in outlying regions. This study has limitations related most importantly to the non-inclusion of factors other than attitudinal in the analysis. Furthermore, the SEM analysis did not apply an exploratory modeling in order to develop the underlying theory in such a way as to provide a better fit to the data.

Finally, we believe that additional studies could be conducted in the future in order to assess the influence of other groups of factors stemming from the TPB model, namely those related to subjective norms and perceived control of behaviour.

References

- Bagozzi, R. P. (2007). “The legacy of the technology acceptance model and a proposal for a paradigm shift”, *Journal of the Association for Information Systems*, Vol. 8, No.4, pp 244-254.
- Bélanger, F., Hiller, J. and Smith, W. (2002) “Trustworthiness in electronic commerce: The role of privacy, security, and sites attributes”, *Journal of Strategic Information Systems*, Vol. 11, No.3-4, pp 245-270.
- Carter, L. and Bélanger, F. (2005) “The utilization of eGovernment services: citizen trust, innovation and acceptance factors”, *Information Systems Journal*, Vol 15, No.1, pp 5-25.
- Carter, L. and Weerakkody, V. (2008) “EGovernment adoption: A cultural comparison”, *Information Systems Frontiers*, Vol 10, No. 4, pp 473-482.
- Chuttur, M. Y. (2009) “Overview of the Technology Acceptance Model: Origins, developments, and future directions”, *Indiana University USA. Sorputs: Working papers on Information Systems*, Vol 9, No. 37, pp 1-21.
- Emploi Québec. (2009). “Profil socio-économique – Nord du Québec – 3^{ème} édition” [online], http://emploi.quebec.net/publications/Liens-indirects/10_etude_profil_portrait-sociodemographique.pdf
- Evans, D. and Yen, D. C. (2006) “EGovernment: Evolving relationship of citizens and government, domestic, and international development”, *Government Information Quarterly*, Vol 23 (2), pp 207-235.
- Goldfinch, S., Gauld, R. and Herbison, P. (2009) “The Participation Divide? Political Participation, Trust in Government, and EGovernment in Australia and New Zealand”, *Australian Journal of Public Administration*, Vol 68, No.3, pp 333-350.
- Hung, S.-Y. and Chang, C.-M. and Yu, T. (2006) “Determinants of user acceptance of the eGovernment services: The case of online tax filing and payment system”, *Government Information Quarterly*, Vol 23, No.1, pp 97-122.
- Hung, S.-Y., Tang, K.-Z., Chang, C.-M. and Ke, C.-D. (2009) “User acceptance of intergovernmental services: An example of electronic document management system”, *Government Information Quarterly*, Vol 26, No.2, pp 387-397.
- Lean, O., Zailani, S., Ramayah, T. and Fernando, Y. (2009) “Factors influencing intention to use eGovernment services among citizens in Malaysia”, *International Journal of Information Management*, Vol 29, No.6, pp 458-475.
- Moon, M. J. (2002) “The evolution of EGovernment among municipalities: rhetoric or reality?”, *Public Administration Review*, Vol 62, No.4, pp 424-433

- Previtali, P. and Bof, F. (2009) "EGovernment adoption in small Italian municipalities", *International Journal of Public Sector Management*, Vol 22, No.4, pp 338-348.
- Statistics Canada (2006). "Appendix 2006 Geographic areas" [online], <http://www12.statcan.ca/census-recensement/2011/consultation/DissDiffGuide/Appendix-Annexe-eng.cfm>
- Tassabehji, R., Elliman, T. and Mellor, J. (2007) "Generating Citizen Trust in EGovernment Security: Challenging Perceptions", *Complete Collection of IGP Information Technology Case Collection Depository*, Vol 3, No.3, pp 1-17.
- Thomas, J. C. and Streib, G. (2003) "The New Face of Government: Citizen-Initiated Contacts in the Era of EGovernment", *Journal of Public Administration Research and Theory*, Vol 13, No.1, pp 83-102.
- van Dijk, J., Peters, O. and Ebbers, W. (2008) "Explaining the acceptance and use of government Internet services: A multivariate analysis of 2006 survey data in the Netherlands", *Government Information Quarterly*, Vol 25, No.3, pp 379-399.
- Yang, H. D. and Yoo, Y. (2003) "It's all about attitude: Revisiting the Technology Acceptance Model", *Decision Support Systems*, Vol 38, No. 1, pp 19-31.

Exploring Different Levels of eGovernance Development in Romania: Case Study in Bihor County

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Abstract: This article investigates the level of development of eGovernance instruments at local levels in both urban and rural areas in Bihor County – Romania. The practicality of this topic is derived from the fact that Romania is lagging in terms of level of e-government development (UN Report 2010) when compared to Eastern-European countries or to other states. Given the fact that the usage of these instruments determines the increased efficiency in the administrative processes, as well as an increase of the institutional trust and public participation of citizens, this topic becomes particularly relevant for Romania as rates of trust in the public system and those of public and civic participation are lower than in all Eastern-European countries. This research thoroughly analyzed the eGovernance instruments used at local levels in urban and rural areas. The main research questions addressed were: *which is the level of development of eGovernance at local levels in urban and rural areas?* and *how can we explain the disparities between Romania and other Eastern-European states in implementing these instruments?* The findings presented in this paper are inferred from the field work conducted within the international research project Establishment of R+D programmes in the field of new public management between economic faculties of higher education in Hajdu-Bihar and Bihor Counties, implemented in partnership by the University of Oradea, Romania and Debrecen University, Hungary. Within this project a distinct topic of investigation emerged related to the implementation of eGovernance instruments as well as the promotion of decisional transparency and public participation as a means for increasing the efficiency of administrative processes; key elements of New Public Management. We analyzed several data resources: we conducted a systematic analysis of all web sites available for the Mayor's Offices in Bihor County, data that was complemented with in-depth information gathered from representatives of 30 Offices selected in the urban and rural areas from this county. The theoretical perspective is dedicated to presenting the elements, advantages and instruments of eGovernance in developing countries and Romania in particular. The research describes and assesses the level of development of eGovernance instruments used at Mayor's Offices in urban and rural localities from Bihor County. The *local factors* are identified through the interviews conducted for 30 Mayor's Offices, as well as the *contextual* ones – by disclosing the effects of European integration, decentralization and regionalization in Romania. Our paper concludes with the factors that explain the disparities between the level of development of eGovernance instruments in Bihor county and outlines policy recommendations in this field.

Keywords: eGovernance, eGovernance instruments, new public management, local government, local public administration

1. New public management and eGovernance in Romania

In the field of new public management, studies focus on the role of citizen participation to ensure the best results of policies, strategies and programs developed and the quality of services. Efforts in this area are submerged under the dimension of social responsibility of the administrative system. One of the main objectives of public management strategies is the development of the region under an administration in a way that recipients are inevitably related to it. This is seen as a political strategy of participation, having a long-term effect on the community development, by providing stability and increased efficiency of the administrative decisions. In the view of the New Public Management, a key element is public accountability, which is best ensured (especially in the case of developing countries) by structures of civil society: Non-Governmental Organizations (NGOs) or groups of citizens that watch, evaluate and sometimes directly participate to decision making (Sarker and Hassan 2010). Public accountability has positive effects on: policies and development programs; sustainability of democracy; improving governance processes and empowerment of the poor.

World Bank defines public accountability as an “approach oriented toward the building of accountability based on civic engagement, more accurate, that in which ordinary citizens or civil society organizations are those who provide responsibility through direct or indirect participation” (World Bank 2004: 1). Conclusively, without saying that the role of the state in ensuring the public responsibility through some surveillance and control mechanisms is smaller, the analyses from the new public management and the role of civil society in ensuring accountability, emphasizes the role of citizens and social structures. These structures are developed in order to watch over administrative processes but also for direct participation in public decisions (Goetz and Jennings 2001).

Starker and Hassan (2010), and World Bank reports, provide many successful examples that reveal the importance of the involvement of some civil organizations to ensure access to public services: access to unused land for poor families from India, mechanisms for food rationing using vouchers (India), surveillance on governmental actions in Ghana, CHAI initiative in Uganda for free access to health services (Starker and Hassan 2010).

Regarding the integrity of local governance, Romanian studies focus on four dimensions of transparency of local public administration: a) public participation, b) access to information and decisional transparency, c) public integrity and d) use of public funds (Transparency International 2011). We consider it important to mention some of the conclusions of a study conducted by Transparency International (Bratu and Nastase 2007) in the period of 2006-2007, in seven localities from Romania:

- the Local Commissions Meetings have a high level of participation from counselors but low public participation, primarily due to the poor knowledge of duties and incentives of the public institution (often the agenda is set with delay and there are last minutes debates).
- The access to public information law (no. 544/2001) and the decisional transparency in public institution law (no. 54/2003) are in most of the cases followed, although there are institutions that do not provide all the information requested.

The data from NGO leaders' Barometre (Lambru et. al. 2010), indicates a rather small number of NGOs who request public information. Specifically, 47.3% have not made any request, while those who participate in decisional transparency, 46.6% did not participate in any public consultation. Moreover, most of the organizations declared "it wasn't the case" at the question regarding the relationship with local and central administration institutions, somehow indicating their poor involvement in "public business".

According to the data from Rural Public Opinion Barometer (Voicu 2005), in rural areas public participation is also relatively low. Although the participation is considered useful for the community and highly esteemed, only 19% are interested in participating in these actions. The availability for public participation is facilitated by gender (men participate more), age (i.e., 30 – 69), employment, income, knowledge of a foreign language, and volunteering.

2. The usage of eGovernance instruments in Romania – data and explanations

The main arguments for the development of eGovernance instruments are related to the strengthening of governance as well as of government processes, since it is considered to ensure transparent information for the public and to consequently increase the public's competence. It is also believed that it, improves the quality of regulation, also as a consequence of public involvement in these decisions (UN Report 2010: 25-27). The most important explanation for these arguments is that ICT can facilitate communication between both the government and its citizens, as well as between the government and the financial institutions. It is also considered that ICT enhances citizen involvement because it promotes connectedness; however, as the UN synthesis shows, this outcome still varies across countries.

As Moura e Sa reports (2011), the European Union established a scheme of evaluating the different levels of web site development for governmental institutions as follows:

- 0 level – the absence of a web site for the public,
- level 1 – information: the website provides the information necessary for fulfilling procedures,
- level 2 – one-way interaction: the website offers the possibility to download forms,
- level 3 – two-way interaction: the website offers the instruments to initiate procedures, fill in forms on-line, apply for certificates and check taxes payment and make on-line payments,
- level 4 – transaction: full electronic procedures (Moura e Sa 2011).

The United Nation's 2010 Report on the level of development of eGovernance instruments around the world revealed the discrepancies between different regions of the world, using the same four-stage development scheme. The e-government development index was based on the thorough analysis of national websites for the following dimensions: e-participation, eGovernance, human capital development, on-line services provision and national infrastructure. This study showed that as far as the level of development of eGovernance instruments is concerned, Romania ranks 47 out of the over

184 nations included in this research, and 6 out of the 10 states from Eastern Europe. Romania's mean score is 0.55, as opposed to the 0.44 world mean score. When referring to Romania's position in Eastern Europe, we consider the following figure relevant as it details the scores obtained at each analysed dimension (Figure no. 1).

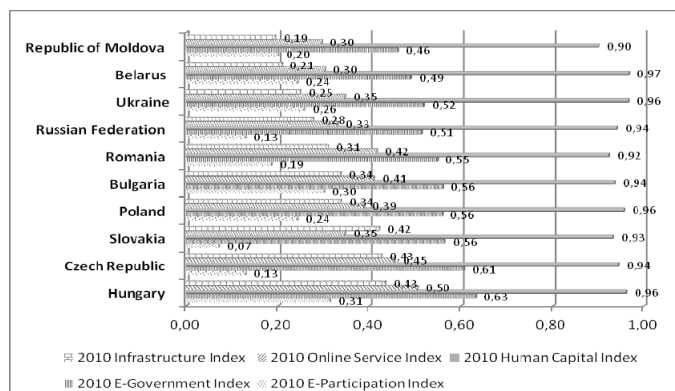


Figure 1: Indexes of eGovernance development in Eastern Europe 2010, based on UN EGovernance data downloaded from <http://www2.unpan.org/egovkb/datacenter/CountryView.aspx> – own analysis

The figure above shows that Romania is at a medium position compared to the nine other Eastern – European countries. Namely it is the seventh position regarding e-participation index and eGovernance while in the sixth position when it comes to infrastructure indexes. The lowest score is that of the human development index where Romania is the ninth place out of the ten countries. However, this is compensated in the total score with the on-line service provision index where Romania is ranked third. The main limit of the UN Report derives from the way the data was collected, taking into account that it must provide internationally comparative data. Our research goes beyond these results. While the UN study analyzed websites of ministries and of other official national portals, our investigation focused on the local level – both in urban and rural localities of one county in Romania. Our main question is why are we still lagging behind other countries and, moreover what can be done to improve this situation.

One of the first explanations that comes to mind is the limited access of the general public computers and internet, and further the low level of usage of these instruments to obtain official information or even interact with the public administration institutions as the digital divide sharpens the social disparities and access to resources (Băltătescu et. al. 2010). In this regard we can say that the level of usage of internet in Romania has increased from 3,5% of the total population in 2000 up to 35,5% in 2010 (Eurostat 2011), but it is still lower than in most European countries (the EU mean is 67,6%). According to Eurostat less than 20% of users are informed through official websites about their actions, as presented in Table 1.

Table 1: Usage of eGovernance instruments by Romanians compared with EU

	Type of activity involving internet usage	RO - 2010	UE - 2010
1	Interaction with public authorities	8%	41%
2	Obtaining information	8%	37%
3	Downloading forms	5%	27%
4	Sending filled forms	21%	4%

Source: own analysis based on EUROSTAT -

http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_bde15ei&lang=en

There are several factors that can lead to this situation: on one hand, there is a low level of interest in public information due to the lack of useful and the low credibility of information posted on-line, even when found on the institution's website. While on the other hand there is the limited access to the internet by the general public. All these factors lead to a small number of people accessing official websites, and to a weak promotion of these websites. According to a study conducted by the Romanian Institute for Evaluation and Strategies in 2011 (IRES 2011), in urban Romania 64% of respondents have access and use internet, and 71% of them use the internet on a daily basis. Moreover, 97% those who use the internet have access to it in their homes, while 58% have access

to it also at their work place or in school. This would suggest that it is not the lack of access to the internet that hinders the use of it for getting official information or in order to relate with the public administration institutions.

But the fact that a small number of people use the websites for information and also to make official transactions through these websites can be explained by the fact that the offer of information and on-line services is limited to only some institutions. As presented above, the level of development of eGovernance instruments in Romania (UN 2010) is rather low, yet this assessment is made on national institutions and portals. We did not find any synthetic assessment of the way local level institutions develop and make use of eGovernance institutions and consequently this is the chore element of our investigation. Initially we expected that at this level, the development of such instruments would be lower than at national institutions. This would be explained by several factors, which were consequently tested during the second part of our research. First we would expect that in smaller communities the interaction between citizens and public institutions and its citizens is more opened and direct – and thus the official representatives will not see the need for development of a website and especially to implement different on-line services on that website. Second, the argument along with the idea that communities further from the County Seat city, are more cohesive and rely on direct communication of public officials with their citizens was proven in a study on public participation in rural areas from Romania (Baba et. al 2009). Thirdly, we would expect that more developed communities will have the resources and the incentives to invest in a well developed website and also different types of e-services.

3. Assessing and explaining the level of development of eGovernance instruments in Bihor County

3.1 Methodological framework

Based on the above arguments we formulated and tested the following hypotheses:

H1: the bigger a community, the greater the chance it has a higher level of eGovernance development;

H2: the closer a city is to the County Seat, the greater the chance it has a higher level of eGovernance development;

H3: the more developed communities have a greater chance to have a higher level of eGovernance development.

Our investigation used several sources of data and methods of investigation. First, we have conducted a general analysis on all the Mayor's Offices from Bihor county – in the North Western Region of Romania. The main focus was on the assessing the level of development of these instruments on a local level – both in urban and in rural areas. Given the low scores of eGovernance in our country, our expectation was to find that most Mayor's Offices in rural areas do not have a website, or that these websites are purely informative.

For this purpose we searched for all Mayor's Office website from all localities in Bihor county. We believe an exhaustive sample on the county level will provide more valuable information about the dynamics of development of such instruments. This was particularly important for the assessment of factors that determine whether some Mayor's Offices develop a website and others not. It is also important in identifying those factors that determine whether some Mayor's Offices present on their websites, different resources which provide transparency concerning the administrative processes and also the use on-line services.

Given the diversity of information posted on these websites we have developed a more generous matrix for analysis, which was subsequently transposed into the four levels of development. The initial matrix was developed on four types of information as follows:

- Name of the locality, type, other information and contact details;
- Is there a website of the Mayor's Offices – if yes, general assessment of user friendliness; and

- Are there available online the resources: 1. presentation of the locality, 2. contact, 3. Schedule (working hours), 4. official decisions, 5. downloadable forms, 6. specific eGovernance instruments (payment or verification of taxes), 7. organizational matrix, 8. internal regulations, 9. planned budget for 2011, 10. financial report for 2010, 11. activity reports.

The data was gathered in September and October 2011 and then analysed by our team using SPSS statistical package for statistical analysis. Also, it is the basis for assessing the level of development of eGovernance instruments in Bihor County.

This database was then supplemented with other aggregated data for each locality in order to test the formulated hypotheses, as follows:

- the size of locality: we used the total population at the latest census (01.01.2009),
- the distance from Oradea, county seat town of Bihor County, measured in kilometres,
- the level of social development of each locality – for this we used an aggregated measure “index of the social development of localities” which offers the leverages the rural and urban disparities so as to make comparisons consistent. This index, constructed by the National Institute of Statistics (Sandu 2011) is based on: educational stock, medium age and life expectancy, private and public material resources, type of the locality.

These analyses and the main findings are presented in the following sections concluding with the validation of our hypotheses. The main conclusions were then challenged by the results of the in-depth surveys conducted on 30 Mayor’s Offices from Bihor County within the project *Establishment of R+D programmes in the field of new public management between economic faculties of higher education in Hajdu-Bihar and Bihor Counties*. Several questions addressed to the Mayor referred to the importance of transparency of administrative processes and the use of public information and PR specific resources in relation with their public.

The final concluding section sums up the findings using all these types of data and complements it with some relevant information from the regional and national level.

3.2 General assessment

Bihor County has a total number of 101 localities: 4 municipalities, 6 towns and 91 communes (the commune is the smallest administrative unit, though each commune is composed of several villages). Out of the 101 localities, 71 have their own website which is more than we previously expected. Out of the 10 urban localities, only one does not have a website, while in the rural areas 67% have their own websites. Regarding the type of information found on these websites, as expected, the urban localities have more information on-line, and the disparity is even higher when one looks at the information related to administrative transparency. Table 2 gives the general overview of the cases in which different information could be found.

Table 2: Type of information posted on the website of all Mayor’s Offices in Bihor County

Type of information	No. of cases
Presentation of the locality	65
Contact	65
Schedule	28
Official decisions	34
Downloadable forms	15
Online services for payments or verification of taxes	15
Organisational matrix	11
Internal regulations	11
Planned budget for 2011	33
Financial report for 2010	23
Activity reports	8

The distribution of different types of information posted on-line is presented below for urban and rural areas. As Figure 2 shows, the results for urban areas revealed that as far as the level of development of eGovernance instruments is concerned, almost half of them could be considered *level 2 – one way interaction* (as four of them have downloadable information), and only one can be considered *level 3 –*

two way interaction. This is the case of the Oradea's Mayor's Office – County Seat town, a website that allows users to make payments, verify the status of personal taxes and establish some on-line appointments. Half of the other Mayor's Offices can be situated on level 1 – information, as they have procedures and contact details. It must be mentioned that one of them is still level 0 as it has no website.

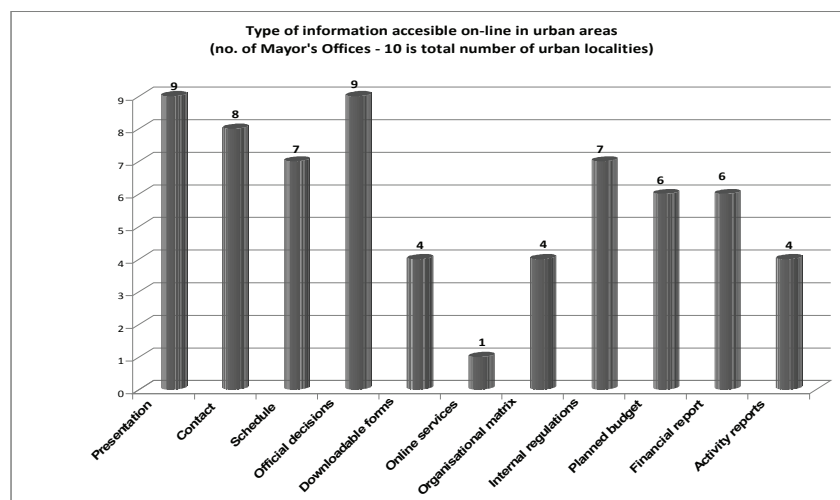


Figure 2: Type of information posted on urban localities Mayor's Offices websites

Given the fact that 62 out of 91 rural localities developed their own websites, exceeding our expectations, yet smaller than the legal recommendations. Table 3 presents the quantitative situation of these cases. It can be seen most of Mayor's Offices are level 1, as they have a website but the information provided is mostly a description of the locality and has little relevance for governance processes.

Table 3: Type of information posted on rural localities Mayor's Offices websites

Type of information	No. of cases	Percentage calculated from the total rural localities (91 cases)	Percentage calculated from the rural Mayor's Offices that have websites (62 cases)
Presentation of the locality	56	60,87%	90,32%
Contact	57	61,96%	91,94%
Schedule	21	22,83%	33,87%
Official decisions	25	27,17%	40,32%
Downloadable forms	11	11,96%	17,74%
Online services for payments or verification of taxes	14	15,22%	22,58%
Organisational matrix	7	7,61%	11,29%
Internal regulations	4	4,35%	6,45%
Planned budget for 2011	27	29,35%	43,55%
Financial report for 2010	17	18,48%	27,42%
Activity reports	4	4,35%	6,45%

One can note from the table above that 15,22% of the websites of Mayor's Offices in rural areas have reached *level 3 of development of eGovernance instrument*, and this is something that exceeded expectations. It is important to note that in most of the cases it is actually a set of on-line services provided by the company and implemented in all the websites provided by a few of the companies as it was noted during the data collection. The fact that *level 2 of development* – one way interaction measured by the existence of downloadable forms, was reached in only 12% of the cases, makes this type of generalization questionable. We would expect that this percentage of 15% represents cases where the on-line services are not fully functional but this issue could not be assessed during this research. This leads us to the question *why* these differences? Why these differences are not reflected in the different stages of development as defined by the EU and UN documents.

3.3 Explanatory factors for the different levels of development of eGovernance instruments in Bihor County

As we already presented, in order to explain the current situation we used different data gathered in all localities in Bihor County. Thus, the *dependent variables* were: for first level of development „has a website”; for second level „has downloadable forms” and for the third level „has on-line services”. The independent variables tested were: number of population, distance to Oradea, and the index of social development of the locality. The statistical analyses were comparisons of mean (T-test) for the rest of the relations.

The main conclusion of these analyses (which will be synthetically presented here due to the limits of this paper) is that the only factor explaining different levels of usage of eGovernance instruments is the level of *social development of the locality*. This factor explains only the transition from level one to the second, namely from information to one-way interaction (with $t=2.3$, $\text{sig}=0.29$) and not the other situations: the existence of the web-site is not explained by any of the variables considered, as is the case of the third level of development (15 cases in Bihor County).

These findings support the argument that the level of development of eGovernance instruments is influenced by the level of social development also at a national level – consequently the eastern European disparities could be explained once more through development.

This conclusion is also supported by our discussions with the Mayors from 30 localities within Bihor County (i.e., urban and rural). One of the most important findings is the great interest and good knowledge Mayors have for different aspects of decisional transparency. In this regard all the respondents declared they know the legislation, they make sure that all the important documents are accessible to the public and organize public meeting as often as needed. The usage of internet as a means for informing the public is seen as adequate for most mayors, yet some consider that most of the people in their community, especially in rural ones, do not have on-line access. This does not inhibit the importance of posting that information online as well. The main obstacle both in developing a website and also in posting different types of information is the lack of money (such activity cannot be subcontracted) and the existing workload of employees (this activity cannot be conducted by people in the office). When asked about the amount of money invested in PR activities most of the Mayor's said *“the money is not enough to pay all the social security payments...”*.

The openness toward online services is smaller and the main obstacles are the same. We would also add here the fact that some of the reluctance may derive from the limited knowledge of such instruments on behalf of both the Mayor and the other employees of the Offices.

eGovernance instrument development is generally related to a wider regional context (Worrall 2011). In Romania, this context is relevant nowadays because of recent public debates regarding *territorial reorganization* in order to change the applied formula - *regionalization by cooperation between existing local collectivities* (administrative decentralization - by delegation). Romania's type of regionalization is limited both in terms of resources and of competences and represents a rather functional response to the EU's requirements in order to allow absorption of funds allocated under the regional policy. *Deepening decentralization and deepening regionalization* of Romania, higher administrative and fiscal competences at regional and local level will definitively increase citizens' trust in e-Government and improve eGovernance instruments development, not only as functional response to the European integration requirements, but also as a process of “learning” of new modes to “make” public policies, characteristic to a multi-level governance, partnership culture and based on transparency.

4. Concluding remarks

The development of eGovernance instruments at local levels is much more nuanced than that of ministries and national portals, as they have different duties and also different target groups. Given these differences, we expected to have lower levels of instrument development for Mayor's Offices of urban and rural localities in Bihor County. The main finding is that in the towns and cities of Bihor County, half of the cases reached the second level of development and one locality reached the third level. While in rural areas 11% of the total Mayor's Offices reached the second level of development with their websites. There are also 15% of the localities that have on-line services, signalling that they reached the third level. Yet it was impossible in the current research to evaluate the functionality of

these services, thus we can only say that there is a great potential for these instruments. The only factor that explains this state of affairs is the level of development of the localities, a conclusion supported by the interviews with the Mayors which stated that they do not have enough money to invest in a better website or different on-line services. This conclusion leads us to the idea that support for the development of these instrument types would be welcomed at the local level and people would make use of them which would sustain long term development.

References

- Baba, C, Cherecheș, R, Mora, C. and Țiclău, T.(2009) "Public participation in public policy process – case study in seven counties from North-Western region of Romania", in *Transilvanian Review in Administrative Sciences*, 26/E, pp. 5-13.
- Băltătescu, S., Hatos, A. and Chipea, F. (2010). "If I'd have a job, it would help me, but..." Socially excluded people from rural areas and the new information and communication technologies. [E.]. An. Inst. De Ist. "G. Barițiu" din Cluj-Napoca, Series Humanistica, VIII, 21-30.
- Bratu, C. and Năstase, A., (2007) *Prin transparență către integritate*, Asociația Pro Democrația and Transparency International Romania, <http://www.transparency.org.ro/publicatii/publicatiiti/2007/Gintegritate2007.pdf> , accessed on 12.02.2011.
- EUROSTAT (2011) *Data on access to internet for public information*, [online], EUROSTAT website, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_bde15ei&lang=en, accessed on 23.11.2011.
- Goetz, A.N. and Jenkins, R.(2010) "Hybrid Forms Of Accountability: Citizen engagement in institutions of public-sector oversight in India", in *Public Management Review* 3: 3, 363 — 383.
- Lambru, M., Vameșu, A. and Kivu, M. (2010) *România 2010. Sectorul non-guvernamental – profil, tendințe, provocări*, București, Fundația pentru Dezvoltarea Societății Civile, [online], http://www.fdsc.ro/library/conferinta%20vio%207%20oct/Romania%202010_Sectorul%20neguvernamental1.pdf, accessed on 03.2011.
- Moura e Sa, Patricia (2011) „eGovernment Implementation and TQM Adoption: An Empirical Study in the Portuguese Municipalities”, in *Electronic Journal of e-Government*, Vol. 9, issue 1, pp. 58 – 67.
- National Institute of Evaluation and Strategies (2011) *Study regarding the usage of internet in Romania – the internet usage behaviour of Romanians*, [online], IRES website, <http://www.ires.com.ro/articol/138/romanii--i-internetul---studiu-privind-utilizarea-internetului-in-romania-%C8%99i-comportamentul-internautic-al-romanilor>, accessed in 20.11.2011.
- Sandu, D. (2011) "Social Disparities in the Regional Development and Policies of Romania", in *International Review of Social Research*, Volume 1, Issue 1, February 2011, 1-30.
- Sarker, A.E. and Hassan, M.K. (2010) "Civic Engagement and Public Accountability: an analysis with particular reference to developing countries", in *Public Administration and Management*, vol. 15, no. 2: 381-417, [online], <http://www.spaef.com/articleArchives.php?journal=PAM>, accessed on 15.03.2011.
- Transparency International Romania (2011) *Raport cu privire la Evoluția statelor membre al Uniunii Europene în ultimul an de evaluare a Indicelui de Percepție a Corupției CPI*, [online], Transparency International Romania website, http://www.transparency.org.ro/politici_si_studii/indici/ipc/2010/02TabelEuroCPI2010.pdf
- United Nations (2010) *United Nations E-Government Survey. Leveraging e-government at a time of financial and economic crisis*, New York, [online], http://www2.unpan.org/egovkb/global_reports/10report.htm, accessed on 21.10.2011.
- Voicu, O., (project manager) (2005) *Eurobarometru Rural. Valori europene în sate românești*, Fundația pentru o Societate Deschisă, [online], European Commission in Romania website, <http://www.infoeuropa.ro/jsp/page.jsp?cid=192&lid=1&id=24564>, accessed in 20.08.2006.
- Worrall, L. ed. (2011) *Leading Issues in eGovernment Research*, Volume I, Academic Publishing International Ltd., Reading, UK.
- World Bank (2004) *State – Society Synergy for Accountability: Lessons from the World Bank*, D.C. Washington, [online], World Bank website, <http://siteresources.worldbank.org/INTPCENG/214578-1116499844371/20524131/297010PAPER0State1society0synergy.pdf>, accessed on 14.06.2011.

Determinants of User Acceptance of a Local eGovernment Electronic Document Management System (EDMS)

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Abstract: On numerous occasions the significant value of the investments involved in the development of eGovernment and the expectations of governmental information systems use do not correspond to the rate of effective use. This scenario makes it difficult to justify the development of electronic government by governments and local authorities among its citizens. It is therefore important to understand the factors that influence the employees' intention of using governmental information systems. With the aim of understanding the determining factors of using an Electronic Document Management System (EDMS) in the context of Portuguese municipalities, this study develops an empirical analysis using the Unified Theory of Acceptance and Use of Technology (UTAUT) model, (Venkatesh et al., 2003). This model's application for information systems research in the governmental context has a weak expression and is unique in EDMS research. This empirical research follows a realist and positivist approach. Data was collected from a survey answered by 2,175 employees of Portuguese municipalities (EDMS users). Partial Least Squares (PLS) was used to test the model proposed. The results showed that Intention to Use is positively affected by Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions. With respect to the EDMS Use, the results showed that it is positively influenced by Intention to Use and Facilitating Conditions. The main result indicates that EDMS users believe that the use of this information system will help them to obtain performance benefits in their work. However, the increasing use of EDMS is not very influenced by the system's perceived ease of use. In short, this study provides a contribution to the Information Systems Acceptance and Adoption literature in local eGovernmental contexts. In addition, our contribution empirically tests the model for implementation in governmental organizations and provides a better understanding of the adoption and use of an EDMS.

Keywords: local eGovernment, UTAUT, determinants of use, EDMS, PLS

1. Introduction

The development of electronic government is on the agenda of most countries that wish to have a modern public administration. In line with this, Portugal presents in its Digital Agenda 2015 and Technology Plan a significant convergence of human, technological and financial resources. One of the major projects of this Technology Plan is the implementation of Electronic Document Management Systems (EDMS) in the modernization of local government services. This type of information system enables the creating, storing, organizing, transmitting, accessing, manipulating, updating, and making available of digital documents for organizational needs (Sprague, 1995). This also enables organizations, such as municipal councils, to have a system for secure document transfers, remote access to documents, to comply with legislative requirements, manage knowledge and improve the efficiency of their activities. Its use is dictated by the increasing quantity of information in a digital format that is being created in organizational contexts (Wilkins et al., 2009).

Despite all efforts to implement EDMS in organizations, only a low rate of EDMS projects is considered successful. No matter how well-planned and implemented the EDMS may be, the success depends on the use and acceptance of a large number of employees. Also, they must be active users (Johnston and Bowen, 2005; Gunnlaugsdottir, 2008). Despite recognizing this, EDMS adoption research has a weak expression (e.g., Borglund and Sundqvist, 2007; Cho, 2007; Bhattacharjee et al., 2008; Gunnlaugsdottir, 2008; Brocke et al., 2010). This also occurs with the use of the UTAUT model for information systems research in the eGovernment context (e.g., Yao and Murphy, 2007; Gupta et al., 2008; Loo et al., 2009; Wang and Shih, 2009; Sapio et al., 2010; Schaupp et al., 2010).

With the aim of applying the UTAUT model to understand the determinant factors of using EDMS in Portuguese municipalities this paper is structured as follows. In the second section the hypotheses concerning the relations determining the use of the EDMS are proposed. The third section presents

the research methodology. Section four includes the data analysis and results. The following section identifies the implications for academics and professionals. In addition, it also presents the limitations and proposals for future research.

2. Literature review and research hypotheses

2.1 Performance expectancy

The Performance Expectancy refers to the perception of success at work by Information Systems and Technology (IST) use. This is the construct of the UTAUT model that has been shown to be the most influential in the intention of use. This influence has been verified both in voluntary and mandatory contexts, and in situations of greater or lesser experience (Venkatesh et al., 2003; Lu et al., 2009). In all these models, a strong influence of Performance Expectancy on Intention of Use was proven (Venkatesh et al., 2003; Kijasanayotin et al., 2009; Zhou et al., 2010). In the context of this research, Performance Expectancy means that the users think that EDMS is beneficial because it speeds up work, improves productivity and mainly because it is useful in performing their tasks. Several studies that used the UTAUT model confirmed that Performance Expectancy has a significant influence on Intention of Use (Al-Gahtani et al., 2007; Chang et al., 2007; Gupta et al., 2008; Wang et al., 2009; Wang and Shih, 2009; Sapio et al., 2010; Venkatesh et al., 2010). Therefore, we hypothesize:

H1 (+): Performance Expectancy has a positive effect on Intention of Use

2.2 Effort expectancy

According to Carter and Belanger (2004), Effort Expectancy is related to the ease of use, ease of learning, flexibility and clarity of the interface. Based on UTAUT, EDMS acceptance is expected to depend on a use that is easy and does not require much effort. Some studies that used the UTAUT model empirically identified the positive effect of the Effort Expectancy variable on the Intention to Use (Al-Gahtani et al., 2007; Chang et al., 2007; Gupta et al., 2008; Lin and Anol, 2008; Kijasanayotin et al., 2009; Wang and Shih, 2009; Sapio et al., 2010). Thus, our second hypothesis is:

H2 (+): Effort Expectancy has a positive effect on Intention of Use

2.3 Social influence

The Social Influence variable reflects the effect of influential factors, such as the opinions of friends or hierarchical superiors, on users' behaviors. In this way, their opinions will affect the adoption of EDMS (Zhou et al., 2010). The social influence role is recognized in many works and therefore it is included in the models of Taylor and Todd (1995) and Thompson et al. (1991). However, there was a lack of recognition in other works, such as the Technology Acceptance Model (TAM) from Davis (1989). Some UTAUT studies showed the effect of Social Influence on Intention of Use (Al-Gahtani et al., 2007; Chang et al., 2007; Lin and Anol, 2008; Gupta et al., 2008; Kijasanayotin et al., 2009; Wang et al., 2009; Wang and Shih, 2009; Sapio et al., 2010). Thus, we hypothesize:

H3 (+): Social Influence has a positive effect on Intention of Use

2.4 Facilitating conditions

The variable Facilitating Conditions reflects the effects of user knowledge and skills, resources access and necessary support on the Use of an information system (Venkatesh et al., 2003; Schaupp et al., 2010). Venkatesh et al. (2003) showed that Facilitating Conditions had a significant effect on Intention of Use during the initial period of low experience. Other studies have also identified such an effect (Hung et al., 2007; Wu et al., 2007; Zhou, 2008; Al Awadhi and Morris, 2008; Shi, 2009; Ho and Chou, 2009; Duyck et al., 2010). Thus, we hypothesize:

H4 (+): Facilitating Conditions have a positive effect on Intention of Use

Consistent with the Theory of Planned Behavior (Ajzen, 1991) and the Model of PC Utilization (Thompson et al., 1991) models, as well as with the work of Venkatesh et al. (2003), several studies have recognized the effect of Facilitating Conditions on Usage behavior (Al-Gahtani et al., 2007; Chang et al., 2007; Gupta et al., 2008; Lin and Anol, 2008; Wang and Shih, 2009; Sykes et al., 2009; Kijasanayotin et al., 2009; Jong and Wang, 2009; Duyck et al., 2010; Sumak et al., 2010; Venkatesh and Zhang, 2010; Zhou et al., 2010). We therefore present the following hypothesis:

H5 (+): Facilitating Conditions have a positive effect on Use Behavior

2.5 Intention of use

The Intention of Use variable comes from the Theory of Reasoned Action (Fishbein and Ajzen, 1975) and aims to measure a user's motivation to adopt a behavior. In this way, the UTAUT model suggests that people's behavior performance is determined by their intention to carry out that behavior (Ajzen and Fishbein, 1980). In the UTAUT model (Venkatesh et al., 2003), the Intention of Use is influenced by Performance Expectancy, Effort Expectancy and Social Influence. In addition, Intention of Use is, along with the Facilitating Conditions, decisive in Use Behavior. After the work of Venkatesh et al. (2003), several UTAUT researchers recognized the positive effect of Intention of Use on Use behavior (Al-Gahtani et al., 2007; Chang et al., 2007; Zhou, 2008; Kijisanayotin et al., 2009; Shin, 2009; Sykes et al., 2009; Venkatesh et al., 2010). The aforementioned discussion allows us to formulate the following hypothesis:

H6 (+): Intention of Use has a positive effect on Use Behavior

3. Method

The research methodology follows a quantitative approach. We began with a thorough literature review. Next, we carried out a survey to collect data. Finally, we applied PLS statistics to test the model. PLS was selected because this research aims to predict the dependent variables Intention of Use and Use, and because the variables do not have normal distributions (Henseler et al., 2009; Roldán and Sánchez-Franco, 2012: 201). This study uses SmartPLS (Ringle et al., 2005) software.

3.1 Participants

With the implementation of the online questionnaire 2,175 responses were obtained from EDMS users of 71 of the 308 Portuguese Municipalities. The respondents were registered EDMS users from their local councils. These users received an e-mail with an invitation to take part in the study. The respondents were limited by their mayors accepting their participating in the study and because it was necessary for the municipalities to be provided with EDMS and the dematerialization process to have started. The context of implementation of this study is mandatory in nature, since the system use is mandatory.

We applied a pre-questionnaire to validate the understanding of the meaning of the items by the EDMS users. It was given to employees of Municipalities that are users of the system under study and members of a focus group. A simulation of sending the inviting messaging was also carried out.

The development of this process resulted in some changes in some statements, formats and also in the correction of some errors. This pre-test process was repeated until we realized that the research tool was ready to be applied to recipients.

3.2 Measures

The items used for Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions and Intention to Use were adapted from Venkatesh et al. (2003). With regard to these constructs, it was necessary to adapt the items to the context of this work - the use of an EDMS in a local eGovernment context. The answers given to each item of these constructs were measured by a 7-point Likert scale, in which 1 represents the negative extreme of the scale (1= I completely disagree) and 7 the positive extreme of the scale (7= I completely agree). The dependent variable Use was measured by three items adapted from Adams et al. (1992) and was self-reported.

4. Results

4.1 Measurement model

The measurement model is assessed in terms of individual item reliability, construct reliability, convergent validity, and discriminant validity. Individual item reliability is considered adequate when an indicator has a factor loading that is greater than 0.7 on its respective construct (Roldán and Sánchez-Franco, 2012). Most of our individual item loadings are above 0.7 or very near (pe4, u3) (Table 1)

Table 1: Loadings and cross-loadings from measurement model

	PE	EE	SI	FC	IU	U
pe1	0.8765	0.5282	0.4535	0.5066	0.5467	0.4112
pe2	0.9139	0.5130	0.4574	0.4920	0.4194	0.3440
pe3	0.9231	0.5217	0.4939	0.4961	0.4408	0.3712
pe4	0.6914	0.3861	0.5286	0.3634	0.2918	0.2597
ee1	0.5536	0.9146	0.4089	0.6322	0.4253	0.4137
ee2	0.5137	0.9188	0.3946	0.6116	0.3787	0.4296
ee3	0.5633	0.9117	0.4097	0.6267	0.3810	0.3557
ee4	0.4801	0.9274	0.3605	0.6270	0.3846	0.3841
si1	0.4130	0.2993	0.8426	0.3357	0.3330	0.2331
si2	0.4345	0.3118	0.8361	0.3389	0.3176	0.2176
si3	0.5084	0.4013	0.8360	0.4436	0.3261	0.2500
si4	0.4498	0.3888	0.7604	0.4808	0.3453	0.2245
fc1	0.4245	0.5002	0.3840	0.8230	0.3917	0.2274
fc2	0.4468	0.7097	0.3688	0.8470	0.4116	0.3592
fc3	0.5067	0.4777	0.4155	0.7524	0.3661	0.2169
fc4	0.3660	0.4305	0.3967	0.7405	0.3544	0.2275
iu1	0.5357	0.4457	0.3979	0.4899	0.9456	0.4246
iu2	0.4377	0.3753	0.3624	0.4379	0.9442	0.4393
iu3	0.4855	0.3985	0.3923	0.4452	0.9639	0.4218
u1	0.3338	0.3667	0.2350	0.2951	0.4391	0.8828
u2	0.3999	0.4025	0.2812	0.3173	0.3939	0.8692
u3	0.2771	0.2807	0.1639	0.1790	0.2348	0.6982

Note: PE: Performance Expectancy; EE: Effort Expectancy; SI: Social Influence; FC: Facilitating Conditions; IU: Intention to Use; U: Use

Construct reliability is evaluated using two measures of internal consistency: Cronbach's alpha and composite reliability (CR). The interpretation of both values is similar. We can use the guidelines offered by Nunnally (1978) who suggests 0.7 as a benchmark for a 'modest' reliability applicable in the early stages of research. In our research, all of the constructs are reliable (Table 2) since they have internal consistency measures that exceed 0.762 (alpha) and 0.859 (CR). Convergent validity is assessed via the average variance extracted (AVE). AVE values should be greater than 0.50 (Straub et al., 2004). Consistent with this suggestion, AVE measures for all variables exceed 0.627 (Table 2). For an adequate discriminant validity, the square root of the AVE of each construct should be greater than its correlations with any other latent variable (Barclay et al., 1995). All constructs satisfy this condition. In addition, discriminant validity can be also assessed analyzing the cross-loadings table (Table 1). Our measurement model satisfies this requirement since each item loads higher on its own construct than other latent variables, and each construct loads higher with its assigned indicators than other manifest variables (Gefen and Straub, 2005).

4.2 Structural model

The structural model is assessed analyzing the coefficient of determination (R^2) of the endogenous constructs, the algebraic sign, magnitude and significance of the path coefficients, and the predictive relevance of the endogenous reflective variable (Q^2) (Gefen et al., 2011). Consistent with Henseler et al. (2009), bootstrapping (5.000 resamples) was used to generate standard errors and t-statistics. This allows us to assess the statistical significance of the path coefficients. In addition, the bootstrapping confidence interval of standardized regression coefficients is reported. "If a confidence interval for an estimated path coefficient w does not include zero, the hypothesis that w equals zero is rejected" (Henseler, Ringle and Sinkovics, 2009: 306). Specifically, we have applied a percentile approach, which has the advantage of being completely distribution free (Chin, 2010).

Table 2: Composite reliability, Cronbach's alpha and AVE

	Composite Reliability	Cronbach's alpha	AVE	PE	EE	SI	FC	IU	U
PE	0.9158	0.8772	0.7334	0.8564					
EE	0.9555	0.9380	0.8431	0.5755	0.9182				
SI	0.8909	0.8362	0.6716	0.5518	0.4289	0.8195			
FC	0.8703	0.8014	0.6273	0.5493	0.6803	0.4902	0.7920		
IU	0.9662	0.9475	0.9049	0.5127	0.4284	0.4044	0.4820	0.9513	
U	0.8599	0.7623	0.6741	0.4136	0.4316	0.2828	0.3320	0.4504	0.8210

Note:

1) The square root of the AVE score for each construct is shown in diagonal (bold). Off-diagonal values display the correlation between constructs. For discriminant validity the diagonal values must be greater than the values of the correlation.

2) PE: Performance Expectancy; EE: Effort Expectancy; SI: Social Influence; FC: Facilitating Conditions; IU: Intention to Use; U: Use

Table 3 shows the R^2 values of the model's endogenous variables. In this vein, the model explains 32.9% of the variance of IU, corresponding to a moderate level of explanatory power (Chin, 1998). The Use variable has an R Square of 22.0%. The model has an average explanatory power of 27.5%, surpassing the minimum level of 10% recommended by Falk and Miller (1992).

The results for t-values allow us to affirm that all β coefficients are significant. This is also confirmed by the analysis of the significance using percentile bootstrap with a 95% confidence interval (Roldán and Sanchez-Franco, 2012: 206). The results for the algebraic signs are all positive, which confirms the direction of the hypotheses. With respect to the analysis of the explained variance, Intention to Use is explained by Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions - 15.20%, 2.45%, 4.20% and 11.05% respectively. Finally, Use is explained 4.97% by Facilitating Conditions and 17.03% by Intention to Use.

The predictive importance of dependent variables is as prevalent as the Stone-Geisser Q^2 . According to Chin (2010), the cross-validated construct redundancy Q^2 should be used to examine the predictive relevance of the structural model. Accordingly, this model has predictive relevance, because the Q^2 values presented in Table 3 are all greater than zero (Henseler et al., 2009; Roldán and Sanchez-Franco, 2012).

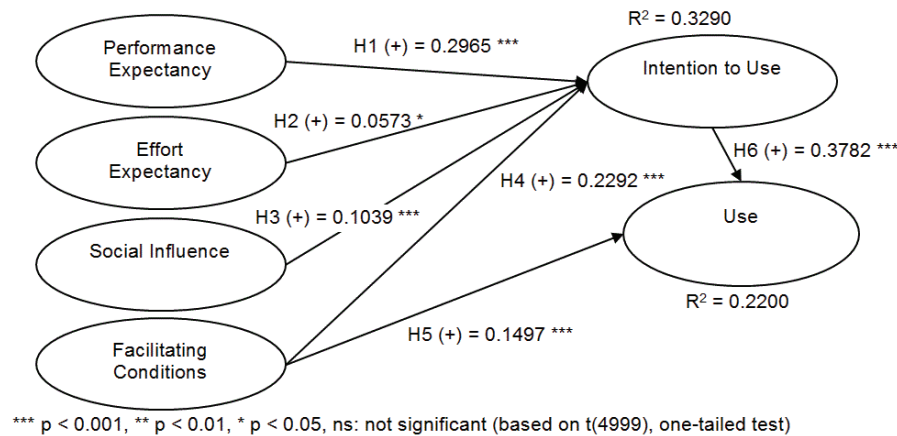


Figure 1: Research model results

5. Discussion

5.1 Theoretical implications

This study contributes to the development of research in Acceptance and Adoption of IST. Replicating an extension of the UTAUT model (Venkatesh et al., 2003), it is contributing to: the general increase in generalization of the UTAUT model; the deepening of the understanding of the use of systems by employees; the accumulated knowledge in this area of research, in particular, and the field of Information Systems in general.

Table 3: Effects on endogenous variables

	Direct effect	t-value	Explained variance	Percentile 95% confidence intervals		Support
Intention to Use (R2 = 0.3290 / Q2 = 0.2948)						
H1 (+): PE → IU	0.2965 ***	9.3202	15.20%	0.2341	0.3610	Yes
H2 (+): EE → IU	0.0573 *	1.9085	2.45%	0.0001	0.1184	Yes
H3 (+): SI → IU	0.1039 ***	4.1625	4.20%	0.0559	0.1528	Yes
H4 (+): FC → IU	0.2292 ***	6.3803	11.05%	0.1583	0.2957	Yes
Use (R2 = 0.2200 / Q2 = 0.1452)						
H5 (+): FC → U	0.1497 ***	5.7952	4.97%	0.1000	0.1975	Yes
H6 (+): IU → U	0.3782 ***	14.1334	17.03%	0.3260	0.4290	Yes

Note:

1) PE: Performance Expectancy; EE: Effort Expectancy; SI: Social Influence; FC: Facilitating Conditions; IU: Intention to Use; U: Use

2) *** p < 0.001, ** p < 0.01, * p < 0.05, ns: not significant (based on t(4999), one-tailed test)
t(0.05, 4999) = 1.65, t(0.01, 4999) = 2.33, t(0.001, 4999) = 3.09

The results showed that the Intention to Use EDMS comes from the perception that it is useful (Performance Expectancy), that it seems easy to use (Effort Expectancy), that it is important to others to believe that an employee must use it (Social Influence) and the perception that technical and organizational support for the use exists (Facilitating Conditions). Also, model analysis showed that the Use of the EDMS is determined by the Intention to Use the EDMS and also by Facilitating Conditions.

Research has empirically shown the direct effects of Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions, which are the main constructs of the UTAUT model. However, the UTAUT model showed the effect of these constructs only with the moderation of Age, Voluntariness, Gender and Experience. In the current study an interesting result was obtained with the significant relationship between Facilitating Conditions and Intention to Use, which was not observed in the UTAUT model.

The study results indicate that the Performance Expectancy is the most important determinant of Intention to Use. These results are consistent with several empirical studies that used the UTAUT model (Al-Gahtani et al., 2007; Chang et al., 2007; Gupta et al., 2008; Wang and Shih, 2009; Wang et al., 2009; Sapio et al., 2010; Venkatesh et al., 2010). However, in the UTAUT model this relationship was only confirmed when moderated by age (-) and Gender (M > W), being more significant for men and young employees.

In the current study, the effect of Effort Expectancy on Intention to Use occurs directly. Thus, the acceptance of the EDMS by the employees depends on if this system is used easily and effortlessly. In the UTAUT model, the effect of Effort Expectancy on Intention to Use does not occur directly but moderated and simultaneously by Gender (W > M), Age (+) and Experience (-), being more significant for women and older workers. This effect decreases with experience.

The direct and positive effect of Social Influence on Intention to Use is empirically verified in this investigation. This result is partially in line with the UTAUT model, where the effect of Social Influence on Intention to Use is only significant when moderated by all four moderating variables included in that study. The role of Social Influence in the use of EDMS can be partly explained by this system being an organizational information system, which supports organizational processes associated with several employees that are naturally influenced by the need to work together with others. The effect of Social Influence on organizational contexts is suggested in the works of Davis (1993) and Davis et al. (1992). On the other hand, the dimensions of the Portuguese culture (Hofstede, 1997) may explain some of the effect of Social Influence on the Intention to Use the EDMS. Consequently, in the Portuguese culture, which verifies a power distance index of 63, employees tend to exhibit a strong association between Social Influence and Intention to Use. In addition, the low level of individualism in Portugal (27) is characteristic of a culture that values collective goals and inter-personal relationships. A high respect for groups suggests that the collective opinion of others can have an impact on individual Intention to Use the EDMS.

Regarding the direct effect of Facilitating Conditions on Intention to Use, the results in this study were significant and relatively expressive, the second strongest determinant being Intention to Use. In this sense, EDMS users expressed that the knowledge and skill as a user of it and the possibility of access to resources and support necessary to use it increases the Intention to Use. This result is consistent with the works of Al Awadhi and Morris (2008), Duyck et al. (2010), Ho and Chou (2009), Hung et al. (2007), Shi (2009), Wu et al. (2007) and Zhou (2008). In the UTAUT model, this relationship was not part of the model, the argument being that the relationship was not significant in the presence of the relationship between Effort Expectancy and Intention to Use.

The result of the direct effect of Facilitating Conditions on Use was significant. In the UTAUT model this effect was only significant when examined in conjunction with the moderating effects of age and experience, i.e., the facilitating conditions only interested older workers with more experience. In short, having hardware and software resources, knowledge and technical support allows users to overcome the barriers to the use of EDMS and facilitate their use (Taylor and Todd, 1995).

5.2 Practical implications

This research also provides implications for information systems and management professionals. In this sense this work provides a model to be applied and therefore it is useful in order to have an understanding about EDMS adoption and use. With their results they can monitorize the EDMS use and compare it with results of this study. To obtain information related to the evolutionary adoption of EDMS, the model should be used periodically. With appropriate modifications, the model of this study can be used to carry out the evaluation of other information systems.

The study results indicate that users with a higher performance expectancy tend to use the EDMS more. Due to this, ways to increase the performance expectancy of the EDMS should be considered. With this in mind, we propose the following measures: make users aware of the impacts of the EDMS on work performance; develop a variety of functions with value that can help meet the potential needs of the most demanding users; cause an increase in competition among users groups; train with the aim of strengthening the expected consequences of EDMS; create structured training programs taking into account the different needs of each group; create organizational goals - group or individual- and time-related handling of documents; plan daily or weekly registration targets for elements that record documents; monitor pending cases of the employees, and of the working group for the process, making this process visible.

With a view to increasing the effect of effort expectancy on the intended EDMS use, it is proposed that the managers identify users with little or no experience using the EDMS and create for them a clear interface that is easy to use and involves little effort. The effort expectancy and the Use of EDMS should be monitored and incentives provided for users to gain initial experience with the EDMS. When the effect of effort expectancy on the intended EDMS use is no longer significant, more advanced options and more complex interfaces with a focus on instrumentality should be offered.

To increase the effect of Social Influence on Intention to Use the EDMS, the following is recommended: to publicize the success of early adopters; to cultivate a positive reaction to the EDMS by the organization's opinion leaders; to identify individuals with greater social capital during the pre-implementation of the EDMS and to create a Community of Practice.

For Facilitating Conditions we propose: to communicate and recognize the successes and progress in order to increase self-confidence; to communicate during implementation what support is being offered to ensure that users have the necessary support and confidence to use the EDMS; to improve hardware and software based on the necessities of the different users or group of users; to ask and follow users' suggestions in order to improve the information systems and working conditions; to obtain the employees' acceptance by emphasizing in training that it is easy to use EDMS.

5.3 Limitations

This research obviously presents several limits beyond the natural time constraint that may have restricted the number of Municipalities and responses. Second, the model of this study does not include variables to moderate the effects of independent variables on the dependents. Third, the present study is limited to not being longitudinal. Fourth, this study reflects the perspective of organizations such as Municipal Councils and we cannot generalize the results to non-governmental

organizations. Fifth, frequency of use is measured in a self-reported way. Sixth, this study is not very clear at the task level of EDMS use. Finally, in light of the cultural dimensions of Hofstede (1997), the generalization of the results is limited to countries with similar levels of cultural dimensions to those of Portugal.

We propose future research of the model of this study with the moderate variables of organizational units, various EDMS software solutions, a hierarchical level of respondents, different sizes of organizations and with different levels of Hofstede (1997) cultural dimensions to those of Portugal. Future study should be longitudinal, which does allow having values that reflect the dynamics of the variables and the relationships between these over time, as the perceptions vary over time and users will also gain experience. Another type of organization should be studied. Finally, Sánchez-Franco (2006) recommends the study of the tool use, in this case of the EDMS, associated with a specific task.

References

- Adams, D.A., Nelson, R.R. and Todd, P.A. (1992), "Perceived Usefulness, Ease of Use, and Usage of Information Technology: A Replication," *MIS Quarterly*, Vol. 16 No. 2, pp. 227-247.
- Ajzen, I. (1991), "The theory of planned behavior," *Organizational Behavior and Human Decision Processes*, Vol. 50 No. 2, pp. 179-211.
- Ajzen, I. and Fishbein, M. (1980), *Understanding Attitudes and Predicting Social Behavior*, Prentice Hall, 1sted.
- Al Awadhi, S. and Morris, A. (2008), "The Use of the UTAUT Model in the Adoption of EGovernment Services in Kuwait," *Hawaii International Conference on System Sciences, Proceedings of the 41st Annual*, Presented at the Hawaii International Conference on System Sciences, Proceedings of the 41st Annual, IEEE, pp. 219-219.
- Al-Gahtani, S.S., Hubona, G.S. and Wang, J. (2007), "Information technology (IT) in Saudi Arabia: Culture and the acceptance and use of IT," *Information & Management*, Vol. 44 No. 8, pp. 681-691.
- Barclay, D., Higgins, C. and Thompson, R. (1995), "The Partial Least Squares (PLS) Approach to Causal Modeling: Personal Computer Adoption and Use as an Illustration", *Technology Studies: Special Issue on Research Methodology*, Vol. 2 No. 2, pp 285-309.
- Bhattacharjee, A., Perols, J. and Sanford, C. (2008), "Information Technology Continuance: A Theoretical Extension and Empirical Test," *Journal of Computer Information Systems*, Vol. 49 No. 1, pp. 17-26.
- Borglund, E.A.M. and Sundqvist, A. (2007), "The role of EDM in information management within SMEs," *2nd International Conference on Digital Information Management, 2007. ICDIM '07*, Presented at the 2nd International Conference on Digital Information Management, 2007. ICDIM '07, IEEE, Vol. 1, pp. 31-36.
- Brocke, J., Simons, A. and Cleven, A. (2010), "Towards a business process-oriented approach to enterprise content management: the ECM-blueprinting framework," *Information Systems and e-Business Management*, Vol. 9 No. 4, pp. 475-496.
- Carter, L. and Belanger, F. (2004), "Citizen Adoption of Electronic Government Initiatives," *Hawaii International Conference on System Sciences*, Los Alamitos, CA, USA, IEEE Computer Society, Vol. 5, p. 50119c.
- Chang, I.-C., Hwang, H.-G., Hung, W.-F. and Li, Y.-C. (2007), "Physicians' acceptance of pharmacokinetics-based clinical decision support systems," *Expert Systems with Applications*, Vol. 33 No. 2, pp. 296-303.
- Chin, W.W. (1998), "The Partial Least Squares Approach to Structural Equation Modeling," in G.A. Marcoulides (Ed.) *Modern Methods for Business Research*, pp. 295-336. Mahwah, NJ: Lawrence Erlbaum Associates, Publisher.
- Chin, W.W. (2010), "How to Write Up and Report PLS Analyses," in Esposito Vinzi, V., Chin, W.W., Henseler, J. and Wang, H. (Eds.), *Handbook of Partial Least Squares*, Berlin, Heidelberg, Springer Berlin Heidelberg, pp. 655-690.
- Cho, V. (2007), "A Study of the Impact of Organizational Learning On Information System Effectiveness," *International Journal of Business and Information*, Vol. 2 No. 1, pp. 127-158.
- Davis, F.D. (1989), "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly*, Vol. 13 No. 3, pp. 319-340.
- Davis, F.D. (1993), "User acceptance of information technology: system characteristics, user perceptions and behavioral impacts," *International Journal of Man-Machine Studies*, Vol. 38 No. 3, pp. 475-487.
- Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. (1992), "Extrinsic and Intrinsic Motivation to Use Computers in the Workplace," *Journal of Applied Social Psychology*, Vol. 22 No. 14, pp. 1111-1132.
- Duyck, P., Pynoo, B., Devolder, P., Voet, T., Adang, L., Ovaere, D. and Vercruysse, J. (2010), "Monitoring the PACS Implementation Process in a Large University Hospital—Discrepancies Between Radiologists and Physicians," *Journal of Digital Imaging: the official journal of the Society for Computer Applications in Radiology*, Vol. 23 No. 1, pp. 73-80.
- Falk, R.F. and Miller, N.B. (1992), *A Primer for Soft Modeling*, University of Akron Press.
- Fishbein and Ajzen, I. (1975), *Belief, Attitude, Intention and Behaviour: An Introduction to Theory and Research*, Addison-Wesley.
- Gefen, D. and Straub, D. (2005), "A Practical Guide To Factorial Validity Using PLS-Graph: Tutorial And Annotated Example," *Communications of the Association for Information Systems*, Vol. 16 No. 1, pp. 91-109.

- Gefen, D., Straub, D. and Rigdon, E. (2011), "An Update and Extension to SEM Guidelines for Administrative and Social Science Research," *MIS Quarterly*, Vol. 35 No. 2, p. iii-xiv.
- Gunnlaugsdottir, J. (2008), "Registering and searching for records in electronic records management systems," *International Journal of Information Management*, Vol. 28 No. 4, pp. 293-304.
- Gupta, B., Dasgupta, S. and Gupta, A. (2008), "Adoption of ICT in a government organization in a developing country: An empirical study," *The Journal of Strategic Information Systems*, Vol. 17 No. 2, pp. 140-154.
- Henseler, J., Ringle, C.M. and Sinkovics, R.R. (2009), "The use of partial least squares path modeling in international marketing," in Sinkovics, R.R., Ghauri P.N. (ed.) *New Challenges to International Marketing (Advances in International Marketing, Volume 20)*, Emerald Group Publishing Limited, pp.277-319
- Ho, C.-T.. and Chou, Y.-T.. (2009), "The Critical Factors for Applying Podcast in Mobile Language Learning," *International Conference on Information Management and Engineering, 2009. ICIME '09*, Presented at the International Conference on Information Management and Engineering, 2009. ICIME '09, IEEE, pp. 411-415.
- Hofstede, G. (1997), *Cultures and organizations: software of the mind*, London: Mc Graw Hill.
- Hung, Y.-H., Wang, Y.-S. and Chou, S.-C. (2007), "User Acceptance of EGovernment Services," *PACIS 2007 Proceedings*. Paper 97.
- Johnston, G.P. and Bowen, D.V. (2005), "The benefits of electronic records management systems: a general review of published and some unpublished cases," *Records Management Journal*, Vol. 15 No. 3, pp. 131-140.
- Jong, D. and Wang, T.S. (2009), "Student Acceptance of Web-based Learning System," *Proceedings of the 2009 International Symposium on Web Information Systems and Applications (WISA'09)*, pp. 533-553.
- Kijsanayotin, B., Pannarunothai, S. and Speedie, S.M. (2009), "Factors influencing health information technology adoption in Thailand's community health centers: Applying the UTAUT model," *International Journal of Medical Informatics*, Vol. 78 No. 6, pp. 404-416.
- Lin, C.P. and Anol, B. (2008), "Learning Online Social Support: An Investigation of Network Information Technology Based on UTAUT," *CyberPsychology & Behavior*, Vol. 11 No. 3, pp 268-272.
- Loo, W.H., Yeow, P.H.P. and Chong, S.C. (2009), "User acceptance of Malaysian government multipurpose smartcard applications," *Government Information Quarterly*, Vol. 26 No. 2, pp. 358-367.
- Lu, J., Yu, C.S. and Liu, C. (2009), "Mobile data service demographics in urban China," *Journal of Computer Information Systems*, Vol. 50 No. 2, pp. 117-126.
- Nunnally, J.C. (1978), *Psychometric Theory*, McGraw-Hill College, 2nded.
- Ringle, C.M., Wende, S. and Will, A.. (2005), SmartPLS. Hamburg, Germany: SmartPLS. Obtained from <http://www.smartpls.de>
- Roldán, J.L. and Sánchez-Franco, M.J. (2012), Variance-based Structural Equation Modeling: Guidelines for Using Partial Least Squares in Information Systems Research. In M. Mora, et al. (Eds.) *Research Methodologies, Innovations and Philosophies in Software Systems Engineering and Information Systems*, pp .193-221. Hershey, PA: IGI Global.
- Sánchez-Franco, M.J. (2006), "Exploring the influence of gender on the web usage via partial least squares," *Behaviour & Information Technology*, Vol. 25 No. 1, pp. 19-36.
- Sapio, B., Turk, T., Cornacchia, M., Papa, F., Nicolò, E. and Livi, S. (2010), "Building scenarios of digital television adoption: a pilot study," *Technology Analysis & Strategic Management*, Vol. 22 No. 1, pp. 43-63.
- Schaupp, L.C., Carter, L. and McBride, M.E. (2010), "E-file adoption: A study of U.S. taxpayers' intentions," *Computers in Human Behavior*, Vol. 26 No. 4, pp. 636-644.
- Shi, W. (2009), "An Empirical Research on Users' Acceptance of Smart Phone Online Application Software," *International Conference on Electronic Commerce and Business Intelligence, 2009. ECBI 2009*, Presented at the International Conference on Electronic Commerce and Business Intelligence, 2009. ECBI 2009, IEEE, pp. 106-110.
- Shin, D.H. (2009), "Towards an understanding of the consumer acceptance of mobile wallet," *Computers in Human Behavior*, Vol. 25 No. 6, pp. 1343-1354.
- Sprague, R.H. (1995), "Electronic Document Management: Challenges and Opportunities for Information Systems Managers," *MIS Quarterly*, Vol. 19 No. 1, pp. 29-49.
- Straub, D., Boudreau, M.C. and Gefen, D. (2004), "Validation guidelines for IS positivist research," *Communications of the Association for Information Systems*, Vol. 13 No. 24, pp. 380-427.
- Sumak, B., Polancic, G. and Hericko, M. (2010), "An Empirical Study of Virtual Learning Environment Adoption Using UTAUT," *Second International Conference on Mobile, Hybrid, and On-Line Learning, 2010. ELML '10*, Presented at the Second International Conference on Mobile, Hybrid, and On-Line Learning, 2010. ELML '10, IEEE, pp. 17-22.
- Sykes, T.A., Venkatesh, V. and Gosain, S. (2009), "Model of Acceptance with Peer Support: A Social Network Perspective to Understand Employees' System Use," *MIS Quarterly*, Vol. 33 No. 2, pp. 371-393.
- Taylor, S. and Todd, P.A. (1995), "Understanding Information Technology Usage: A Test of Competing Models," *Information Systems Research*, Vol. 6 No. 2, pp. 144 -176.
- Thompson, R.L., Higgins, C.A. and Howell, J.M. (1991), "Personal Computing: Toward a Conceptual Model of Utilization," *MIS Quarterly*, Vol. 15 No. 1, pp. 125-143.
- Venkatesh, V. and Zhang, X. (2010), "Unified Theory of Acceptance and Use of Technology: U.S. Vs. China," *Journal of Global Information Technology Management*, Vol. 13 No. 1, pp 5-27.
- Venkatesh, V., Morris, M.G., Davis, F.D., and Davis, G.B. (2003), "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly*, Vol. 27 No. 3, pp. 425-478.

- Wang, Y.-S. and Shih, Y.-W. (2009), "Why do people use information kiosks? A validation of the Unified Theory of Acceptance and Use of Technology," *Government Information Quarterly*, Vol. 26 No. 1, pp. 158-165.
- Wang, Y.-S., Wu, M.-C. and Wang, H.-Y. (2009), "Investigating the determinants and age and gender differences in the acceptance of mobile learning," *British Journal of Educational Technology*, Vol. 40 No. 1, pp. 92-118.
- Wilkins, L., Swatman, P.M.C. and Holt, D. (2009), "Achieved and tangible benefits: lessons learned from a landmark EDRMS implementation," *Records Management Journal*, Vol. 19 No. 1, pp. 37-53.
- Wu, Y.-L., Tao, Y.-H. and Yang, J. P.-C. (2007), "Using UTAUT to explore the behavior of 3G mobile communication users," *Industrial Engineering and Engineering Management*, 2007 IEEE International Conference on, Presented at the Industrial Engineering and Engineering Management, 2007 IEEE International Conference on, pp. 199-203.
- Yao, Y. and Murphy, L. (2007), "Remote electronic voting systems: an exploration of voters' perceptions and intention to use," *European Journal of Information Systems*, Vol. 16 No. 2, pp 106-120.
- Zhou, T. (2008), "Exploring Mobile User Acceptance Based on UTAUT and Contextual Offering," 2008 International Symposium on Electronic Commerce and Security, Presented at the 2008 International Symposium on Electronic Commerce and Security, IEEE, pp. 241-245.
- Zhou, T., Lu, Y. and Wang, B. (2010), "Integrating TTF and UTAUT to explain mobile banking user adoption," *Computers in Human Behavior*, Vol. 26 No. 4, pp. 760-767.

ICT Influencing eGovernment Network Externalities: Is the Government Social Networking System the Road to eDemocracy and Trust?

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Abstract: Effective, efficient and transparent citizen communication with government representatives raises interest of the researchers to perform academic and nonacademic studies. Nowadays, in developed countries, large numbers of citizens are benefiting eGovernment services and information which are widely accessible. Information kiosks, net bank, healthcare systems, mobile government, Internet and media are the examples of such services. However in all the offered government services and information or eGovernment context in general, citizen's democracy and trust play a crucial role in the advancement of eGovernment implementation and progress. EDemocracy which stands for electronic democracy is the use of ICT to engage citizens to participate in government and political decision making. EDemocracy is strongly linked to trust. Trust is established when one person can rely on the decision and action other person make. In democratic countries, trust has been established. However, in Iran, government still struggle with injecting eGovernment content and value to both government employees and regular citizens. Efficient, effective and transparent e-payment, e-healthcare, e-justice, e-education and other eGovernment services can surely bring value to people's life. What is actually lacking in the eGovernment and ICT academic studies in Iran is the study of benefits ICT emergence can have in the establishment of Government Social Networking System (GSNS) on influencing eGovernment network externalities. Thus, the researchers have studied eGovernment network externalities of Iran. The aim of the research is to examine if GSNS can contribute on eGovernment network externalities in Iran. Moreover, the researchers have deliberated if government technological support and ICT can enhance eDemocracy and trust in Iran. Both qualitative and quantitative research methods had been applied. Self-administrative questionnaire containing seven structured questions were distributed to 800 Iranians. The result was shocking. Only few numbers of respondents were fully familiar with eGovernment and GSNS. When it comes to democracy and trust issues, respondents appear to be so resistive. They make a variety of dissimilar statements while supporting their statements with interesting but disappointing reasons.

Keywords: social networking systems, government social networking system, ICT support in Iran, eDemocracy in Iran, trust issue in Iran

1. Introduction

The advent of digital government or electronic government (eGovernment) has rapidly spread throughout the world leading to a constant stream of policy documents on eGovernment visions from national and super-national agencies. Canada and USA claimed to be among the most salient examples of nations that have implemented effective and efficient eGovernment (Holden et. al 2003). Malaysia and Singapore also say that they are leading in implementing effective eGovernment (Tan and Pan 2003). Furthermore the Scandinavian countries are among the forerunners in eGovernment initiatives, plans, and implementation (Cap and Young 2004 and Henriksen and Damsgaard 2007).

Common characteristic of all eGovernments is citizen centric approach. This approach focuses on how governments are supported to adopt Information and Communication Technology (ICT) to provide more effective and efficient services to citizens, businesses, and governments (Ahmadi Zeleti 2011). Assisting citizens accessing to information and government services in a friendly and efficient way is the primary goal and objective of every eGovernment (Carenini et al. 2007).

Also the new development of technology and eGovernment in particular; address technical problems and often gives rise to new hazards, the present of ICT and Information Technology (IT) in a modern Information Society (IS) gives rise to new forms of social and political interactions (Ahmadi Zeleti 2011 and Anderson and Oswald 2010). European commission (2007) states that "eGovernment services are becoming more effective nationally and more interoperable at European level".

Furthermore, eGovernment growth and improvement of government to citizen communication and interaction (Ahmadi Zeleti 2011) has delivered the idea that citizens are not only the state's customer

and users of such services; they are also its owners (The Economist 2006). Therefore, technology and specifically eGovernment can amplify and aggregate voices that used to be faint and muffled.

In this paper the contribution of Government Social Networking Services (GSNSs) on the network externalities and if technological support and ICT can influence eDemocracy and trust in Iran are being studied and discussed.

Therefore, this paper aims to answer to the following research questions:

- Can Government Social Networking System (GSNS) contribute to the eGovernment network externalities in Iran?
- Can government technological support and ICT influence eDemocracy and trust in Iran?

We started by a brief study on GSNSs. We then discussed if GSNS can contribute to the eGovernment network externalities in Iran. Finally, we explained if technological support and ICT can influence eDemocracy and trust.

The paper proceeds as follows: Section two discusses the related literature on GSNS, ICT and the research questions. Section three provides the information about the research methodologies. Section four presents the result. Section five presents recommendations and finally, section six presents the concluding remarks.

2. Review of the related literature on GSNS and ICT

In this paper the term Social Networking Services (SNSs) refers to the online social networking platforms or sites such as Facebook, Hi5, Friendster, Mixi, MySpace, LinkedIn, or Xing where people from all over the world meet and communicate with each other. However, the term G in GSNSs means that the social network platforms are used by both government and citizens. Government information and services can be easily broadcasted via these platforms (Boyd and Ellison 2007). Therefore, social networks are presumed to be embedded in large social systems some refer to as a community which is not bound to one geographical area. The size of a network, its connectedness, centrality, formalization, and hierarchy reflect important social conditions (Streeter and Gillespie 1992). Hence, GSNSs may provide a comfortable environment within which government officials can communicate and cooperate with larger number of citizens (Baker and Oswald 2010). These social networking platforms or sites can model real social networks in a virtual environment. They can be defined as web-based services that allow citizens to (Boyd and Ellison 2007 and Schellong 2008):

- construct a semi-public or private profile within a bounded system;
- communicate with the government officials;
- freely post/view information, feedback, drawbacks, and comments in/from the blogs, wikis, and discussion groups within the bounded system;
- receive service update and assistance from the government;
- And receive up to date government information.

Furthermore, Schellong (2008) mentions that since these platforms are hosted on government servers and the development of the platforms are done in work and free-time costs can be considered insignificant. Schellong (2008) includes four points to encourage government to pursue GSNSs: First, citizens are much better at sharing government information, so each citizen's network serves as a multiplier. Second, platforms help the society to grow stronger by sharing information, and comments in a pleasant atmosphere. Third, platforms present government information and services in a different way. Forth, members can invite contacts, spread of word-of-mouth information within the society, therefore, introducing and marketing is partially done by the citizens. As a consequence, administrator and government officials can learn from citizens, thus improving the citizen government relationship Schellong (2008).

Schellong (2008) however claims that resistance of citizens to participate in GSNSs can have pressure and add difficulties to the development of GSNSs. Citizens confess that why put their information online and how it could be further utilized by the government. He further declares that the democracy and trust should be well established in the society so that people could facilitate each other more by learning more about/from each other, what they could do for the society and as a result rely less on

government. Therefore, it is important to take a gradual approach of getting more users and introducing the platform said Schellong (2008).

Besides, government devotes a large amount of their investment in ICT and eGovernment projects while promoting citizen's continuous patronage to ICT and eGovernment services. This is because the development of ICT and citizen adoption to ICT is crucial to eGovernment and eDemocracy in an advance level (Lin et al. 2011). Akther et al. (2007) believe that the optimistic projections of impact for ICT suggest more widespread and rapid employment, productivity, output and access to facilities, which in turn, enhance the quality of life. However, to increase the citizen's quality of life and supporting eGovernment, Gichoya (2005) argues that ICT causes a "paradigm shift" introducing "the age of network intelligence", reinventing businesses, government, society, and individuals. The value of ICT lies in its ability to assist the government in finding solutions to its problems (Gichoya 2005). Problems like expanding the electronic voting systems where citizens can participate effectively in decision making which in turn can lead to a great eDemocracy where eDemocracy may make a difference in places where the middle class has become largely disengaged from politics. The story so far is that the development of technology intensifies the democratic process, but does not fundamentally change it (The Economist 2006). However, Gross (2000) argues that when talking about eDemocracy, a particular challenge of a universal services lies in the fact that the training, experience, and resources vary considerably among citizens. He furthermore argues that the preferences and interests of citizens are dissimilar. In fact, a universal service does not mean that every citizen can and should do one thing in the same and equal way. Rather, the minimum level of service requirements should be defined in order to make the citizen's participation meaningful (Gross 2000). Gross (2000) has more discusses the main three requirements for citizen's participation and eDemocracy:

- Public access to information: for citizens to participate in decision making, access to various types of information in necessary (Ex: information about policy, representatives, and voting process).
- Open discussion participation: open discussion has two approaches. First is the top-down approach where citizens need possibilities to contact elected representatives and have direct interaction with them. Second is the bottom-up where discussions among citizens take place. Thought, open discussion can broaden their understanding by exchanging information, views, and feelings.
- E-voting: Electronic voting on one hand is an important piece which offers many advantages. Citizens can easily vote right at their homes or from anywhere else. On the other hand, the e-counting saves a lot of times and efforts. However, e-voting entails several challenges and obstacles such as authentication of the voter and the guarantee of the privacy.

In a society where technology advances every six month, government is supposed to make communication possible and safe by technological support and ICT. This support gives a great hope to the proponents of eDemocracy (The Economist 2006). Ahmadi Zeleti (2011) believes that fast and trusted Internet connection, appropriate network technologies and support, communication externalities and ICT are the main road to successful eGovernment. In Figure 1, Somasundaram and Damsgaard (2005) show the impact of Internet on eGovernment.

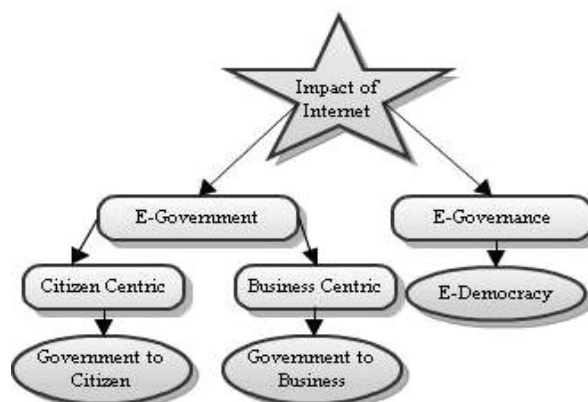


Figure 1: Impact of the Internet on government

Aside from Internet and technological support, Oates (2003) claims that ICT can potentially contributes to the democratic process by supporting three different types of activities:

- Obtaining information
- Engaging in deliberation
- Participating in decision making

All the three activities are shown as ordered and cumulative as illustrated in Figure 2.

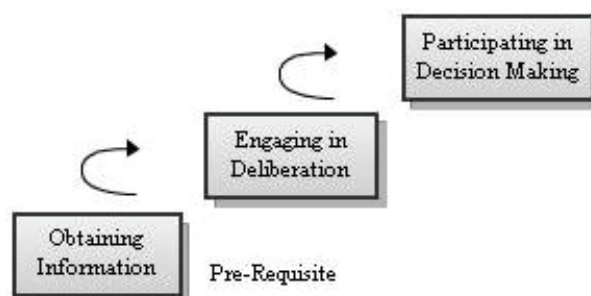


Figure 2: Contribution of ICT to the political process

Citizens may lack political information necessary for participating in the political process plus decision making, and training to democratic processes (Oates 2003). According to Oates (2003), ICT can facilitate accessing to the needed information of 1) the government, 2) political system and process, 3) political issues, and 3) democratic process through for instance, government websites, political parties, campaigning groups and online news services.

Moreover, trust between citizens and government officials is needed for ICT to act as an effective tool for communication. Citizens can establish distrust when the communication and result they expect to receive from government is negative. Trust and distrust are the rational responses by individuals to the performance of a community, society, and government. When individuals face unsecure living environment, distrusted technology, discrimination, intolerance, and neglect, a culture of distrust can easily arise (Rainer and Siedler, 2008). When citizen's expected trust is established, ICT has a potential role either to enhance or reinvigorate this communication and deliberation (Ahmadi Zeleti 2011).

The most obvious way in which citizens are participating in political decision making is when they cast their vote for their government representative. ICT and e-voting can construct the voting process more convenient (Oates 2003). Furthermore, the voter's accessibility to technology and well established ICT can make it possible for e-voting to be used in a larger scale (Oates 2003).

3. Methods

Both qualitative and quantitative methods were used to explore substantive areas about which little is known or about which much is known to gain novel understandings (Strauss and Corbin 1990). Since little is known about ICT influencing network externalities of eGovernment of Iran; we applied grounded theory. Selected methods provide the possibility to respondents to freely express their opinions in a manner that helps the researchers to gain a deeper understanding of the topic.

Therefore, a hard copy questionnaire containing seven structured questions was designed and distributed to 800 Iranians regardless of their age, social status, occupation, education, religion, and income level. The questionnaire was categorized in three parts. Part one covers two questions regarding the level of respondents' familiarity to eGovernment and GSNS; part two comprises two questions regarding respondents' thought on if GSNS can contribute to network externalities and; part three has three questions relating to government technological support and ICT influence, stimulus eDemocracy plus trust in the government systems of Iran. We tested the questionnaire with 20 managers and 24 university professors. They found it quite appropriate and relevant. Only small changes were needed. We answered the research questions by combining data from both the questionnaire and past studies.

4. Findings and discussion

This section presents the result. All 800 respondents found it easy to navigate around the questions. According to almost all academic respondents, the questions were professionally structured and easy to understand. Questions were structured in three categories each having a number of questions. The result of each category is presented separately in the following sub-sections.

4.1 Respondent's familiarity to eGovernment and GSNS

Two questions in the first part of the questionnaire illustrate respondents' familiarity or knowledge to GSNS and eGovernment (Figure 3.).

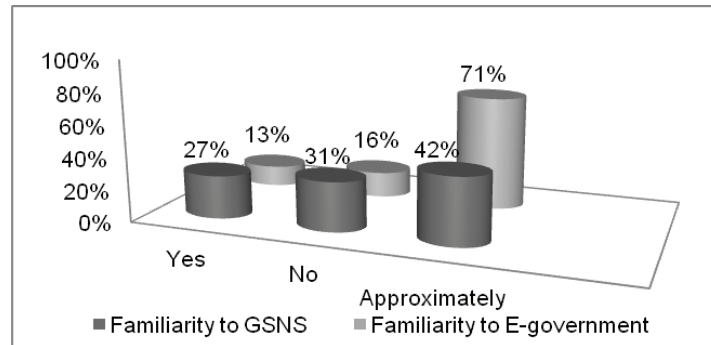


Figure 3: GSNS and eGovernment familiarity

Figure 3 illustrates that only 27 percent of the respondents are completely familiar with GSNS, 31 percent are having no idea, and 42 percent have approximate knowledge about GSNS. The second question illustrates that only 13 percent of the respondents are completely familiar with eGovernment, 16 percent have no familiarity at all, and 71 percent of the respondents have approximate knowledge of eGovernment. As shown in the chart, large number of participants has agreed that they do have approximate understanding of both GSNS and eGovernment. They further argue that the education and citizen familiarity on such issues are poor in Iran. Since both issues are new to the people of Iran, no appropriate communication channels and education centers are focusing on educating people. This causes people to have less knowledge or no knowledge at all.

4.2 Respondent's Idea on if GSNS can contribution to network externalities?

Two questions in the second part of the questionnaire illustrate the citizen's idea on if GSNS contributes to network externalities? (Figure 4.).

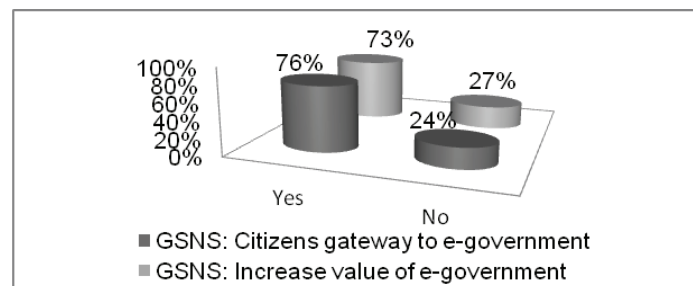


Figure 4: GSNS contribution on network externalities

Figure 4 shows that 76 percent of the respondents agreed that GSNS contributes to eGovernment network externalities. They reported that, GSNS is one of the main avenues which can deliver the eGovernment context and essentiality and therefore can have a great contribution to network externalities. Furthermore, they mentioned that citizens are much more comfortable when they notice that sites where they can do things online exist. However, 24 percent of them have reported that GSNS cannot play a significant role to eGovernment network externalities since few sites have been implemented and errors are undeniable. They have added that GSNS is implemented by government authorities and all its services are designed in a way that it benefits them at first before considering the benefit and democracy of the citizens. They included that they cannot trust such sites and cannot have free movements since all the activities of the citizens are significantly monitored by the government authorities.

Moreover, 73 percent of the respondents have answered "Yes". They believe that when citizens are able to operate and navigate through the pages of the site and interact with other citizens and government authorities errorless; they have a bigger chance and opportunity to test and realize the advantages of the online world. They also believe that each citizen's network in GSNS serves as a multiplier. This is an extraordinary way to increase citizens' awareness. Nevertheless, 27 percent of the respondents have answered "No" to the question asking if SNS can increase the value of eGovern-

ment. This group of citizen reported that there are true eGovernment characteristics such as excellent services, security, trust, and democracy; if implemented; is the starting point for eGovernment to increase its value.

4.3 Technological support and ICT

Three questions in the last part concentrate on the influence of government technological support and ICT on eDemocracy and trust in Iran. Question one simply reports the regular Internet usage of the respondents in 24 hours (Figure 5.). Figure 6 illustrates if the citizen's use of Internet and eGovernment will increase if ICT is supported by government and finally if technological support and ICT can influence eDemocracy and trust in Iran.

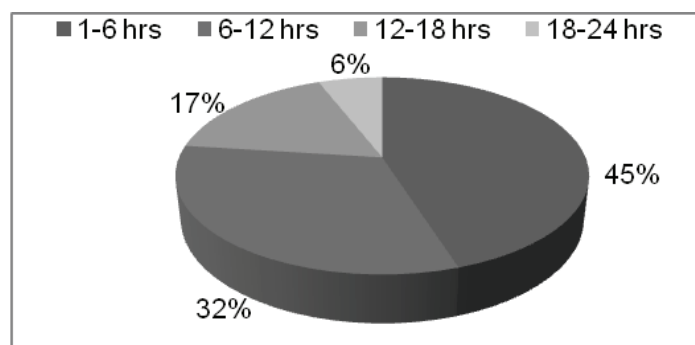


Figure 5: Regular internet usage of the respondents

According to figure 5, 45 percent of the respondents use Internet for one to six hours in every 24 hours. 32 percent use Internet for about six to 12 hours, 17 percent use Internet between 12 to 18 hours and only six percent use Internet for over 18 hours.

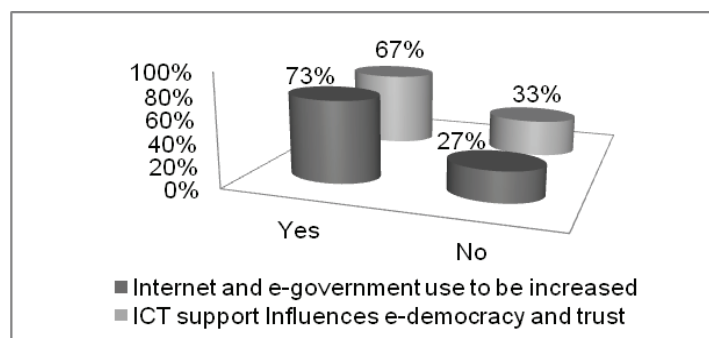


Figure 6: Internet, technological support and ICT

Figure 6 shows that 73 percent of the respondents agreed that the use of Internet and eGovernment increases if ICT is well supported by the government. They believed that ICT is the primary tool for the success of Internet and eGovernment. They have also mentioned that if development of ICT of Iran can receive a better attention and support of the government authorities, more citizens will be engaged with eGovernment and this achievement will have a critical role in the economy advancement of the country. However, 27 percent of the respondents have claimed that the use of Internet and eGovernment will not increase because they do not trust the government ICT support. They believe that government will turn every implementation around their own benefits without considering the right of the citizens.

Additionally, 67 percent of the respondents have reported that government ICT support influences eDemocracy and trust. They believe that with ICT support they can now ensure and guarantee that the final decision is made by the electronic counting system according to the number of votes. They also reported that internet and eGovernment services will be more efficient when ICT is well supported. Conversely, 33 percent have reported that government ICT support does not influence eDemocracy and trust. They argue that this support is not any more trustworthy. They further claim that citizens can establish distrust when the outcome of such communication is negative which usually is. They added that when there is no trust that can be established between the citizens and the government authorities, how the trust to the government support and ICT can be established.

Atena Ahmadi who is a third year university student has mentioned:

"I was so happy when I heard the university tuition fee is payable online. I was already so tired of staying long in the line of the cashier counter to just pay my tuition fees. It was last semester that I logged in to my online bank account to pay the fees. After the confirmation, I have printed the confirmation page out. When the classes start, my name was not in the list. I have visited the financial office of the university. It was so shocking when they say I have not paid my tuition fees. I was shocked. Good that I had printed the confirmation page; unless, how could I prove that I have paid. So, their e-payment can crash sometimes. How that can be possible. This is just not going to work".

Peyman Bararnia who is an employee of a private company has mentioned:

"EDemocracy! Trust! What are the strange words to me. There are no such systems to be implemented in Iran that can offer eDemocracy and trust to people. As long as the government authorities who are against the real democracy are up there, we will never have such systems. They own the ICT, so they know how to manage it in order to get everything on their own side."

Dr. Abbasi, a university professor has shared:

"Ok. Just imagine that we have got the right attention of the authorities. The ICT, eGovernment, Internet and supports are all on routine as we expected. We have the democracy. Do you think that people are ready to these changes? The technology is available. Do you think that people are ethnically, psychologically, mentally and culturally ready to face this advancement? People are lazy and not respecting their rights. So, I don't think ICT support can influence eDemocracy and trust unless, people are ready for it. "

Habib Habibzadeh, a high school teacher has shared:

"Iranian citizens are treated with unsecure living environment, discrimination, intolerance, rejection and neglect. This is why a culture of distrust can easily arise."

Therefore, the respondents have argued that the democracy and trust should first be respected not only by government authorities but also by citizens before attempting to have ICT as a tool to develop eDemocracy and trust in Iran.

5. Analysis and recommendations

Based on the results described in section four, an ICT model was designed to assists the readers to establish in-depth understanding to the insight of the study (Figure 7). A successful introduction and implementation of ICT, eGovernment and eDemocracy fulfilling both government and citizen's needs require Iranian authorities to acknowledge and pursue the following five phases:

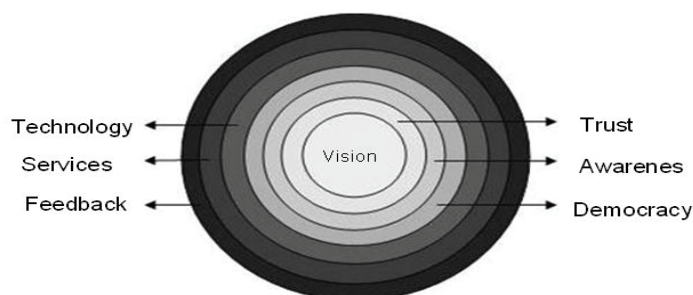


Figure 7: ICT model

Pre-requisite phase: the eGovernment vision should be defined. Trust, the most important issue, should be established. In this level, citizens are supposed to trust their government and representatives. There should be no governmental action resulting distrust. Government should then start forecasting news and advertisement to increase citizen awareness on government performances. Mass media is the primary tool and strategy to increase awareness.

Education phase: ICT and eGovernment lessons should be compulsory in both high-school and university curriculums. Fresh university graduates should be assigned in number of ICT and eGovernment development projects. People do not appreciate and response to any forced training. Therefore, education should be entertaining and enjoyable to be effective.

Deployment phase: there should be a trial period to involve citizens in number of daily use ICT services. Public access like information kiosks in shopping malls, schools, terminals and stations are where citizens can access to ICT and eGovernment services. In addition, government can also observe citizens' activities. This helps to increase citizens' awareness toward ICT and eGovernment.

Implementation phase: citizens are supposed to engage in and collaborate with government decision making process. This can promote and ensure democracy. By embedding democracy into the technology eDemocracy is emerged. The emergence of eDemocracy and its principles, trust is established. E-services are designed and created according to these principles. Citizens will become accustomed to eGovernment and its services and eventually establish interest to help the development process.

Feedback phase: government is for people and people are to use eGovernment services. Therefore, authorities should allocate budget and time to conduct research on citizen's fundamental needs and request for feedback which is an important factor for the further development. Feedbacks, drawbacks, and comments received from citizens are the primary factors to the enhancement of ICT, eGovernment and eDemocracy.

6. Conclusions

This study shows that people of Iran are less familiar with eGovernment and GSNS. The problems such as no appropriate communication channels to expand and forecast the idea and advantages of eGovernment and GSNS to the people and no efficient education are the reasons to abandon increasing knowledge of the people to this subject. Government authorities are less likely to explore people to take note their comments, feedbacks and ideas. Following and truly applying the five phases presented in section six can certainly help the situation.

However, people believe that GSNS can play a vital role to increase the citizen's awareness to eGovernment. This awareness will therefore enhance and elevate the significance and implication of eGovernment. Nevertheless, it is not accepted that government technological support and ICT alone can extend the citizen's awareness and use of Internet and eGovernment. Citizens believe that government support of ICT can be considered as one of the criteria but not all what is needed.

Alternatively, government technological support and ICT can partially influence eDemocracy and trust in Iran. The idea that every technology that is introduces changes its environment is not 100% a trustworthy statement to make about eGovernment of Iran. The relevant phrase as of this time is: "the environment in Iran changes its technology".

References

- Ahmadi Zeleti, F., 2011. Improvement of EGovernment in Islamic Republic of Iran: Identifying the Obstacles of Implementing and Improving EGovernment. *5th Symposium on Advance and Science Technology, Khavaran Higher-education Institute*. Iran: Mashhad, May 17, Mashhad.
- Akther, M.S. Onishi, T. and Kidokoro, T. "EGovernment in a developing country: citizen-centric approach for success", *International Journal of Electronic Government*, 2007, Vol.1, No. 1, pp. 38 – 51.
- Alexander R.M. Schellong, (2008) "Government 2.0: An exploratory study of social networking services in Japanese local government", *Transforming Government: People, Process and Policy*, Vol. 2 Iss: 4, pp.225 – 242
- Anderson, S. and Felici, M. "How democracy will eDemocracy be?", 29th Annual International Computer Software and Applications Conference, 2005, Vol. 2, pp. 499.
- Boyd, D.M. and Ellison, N.B. "Social networking sites: definition, history, and scholarship", *Computer-Mediated Communication*, 2007, Vol. 13, No. 1, p. 11.
- Cap G.E. and Young, "Online Availability of Public Services: How is Europe progressing", Report prepared for European Commission DG Information Society, 2004.
- Baker, L.R. and Oswald, D.L. "Shyness and online social networking services", *Journal of Social and Personal Relationships*, 2010, Vol. 27, No. 7.
- Carenini, M. Whyte, A. Bertorello, L. and Vanocchi, M. "Improving Communication in EDemocracy Using Natural Language Processing", *Journal of Computer Society*, 2007, Vol. 22, No. 1, pp. 20 – 27.
- Centeno, C, van Bavel R and Burgelman JC (2005) "A prospective view of eGovernment in the European Eunion" *The Electronic Journal of eGovernment* Volume 3 Issue 2, pp 59-66, available online at www.ejeg.com
- European Commission, 2007. The commission's work program for 2007. Available at http://ec.europa.eu/atwork/programmes/index_en.htm
- Gichoya D (2005) "factors Affecting the Successful Implementation of ICT Projects in Government" *The Electronic Journal of eGovernment* Volume 3 Issue 4, pp 175- 184, available online at www.ejeg.com

- Gross, P.D. "Technological Support for eDemocracy: History and Perspectives", 11th International Workshop on database and Expert Systems Applications, 2000, pp. 391 – 395.
- Holden, S.H, Norris, D.F. and Fletcher, P.D. "Electronic government at the Local Level – Progress to Date and Future Issues", Public Performance & Management Review, 2003, Vol. 26, No. 3, pp. 1-20.
- Kolsaker, A, and Lee-Kelley, L. "Singing From the Same Hymnsheet? The Impact of Internet Stakeholders on the Development of eDemocracy." *Electronic Journal of eGovernment* Volume 7 Issue 2 2009,(pp. 155 - 162), available online at www.ejeg.com
- Lin, C.P. Tsai, Y.H Wang Y., and Chiu C.K., "Modeling IT relationship quality and its determinants: A potential perspective of network externalities in e-service", Technological Forecasting & Social Change, 2011, Vol. 78, pp. 171-184.
- Oates B., "The potential contribution of ICTs to the political process" *Electronic Journal of eGovernment* Volume 1 Issue 1, 2003, (pp31-39), available online at www.ejeg.com
- OECD, "Annual report", 2003, available online at <http://www.oecd.org/dataoecd/45/28/2506789.pdf>
- Rainer H., and Siedler, T. "Does democracy foster trust?", Journal of Comparative Economics, 2009, Vol. 37, pp. 251-269.
- Somasundaram R and Damsgaard J (2005) "Policy Recommendations for Electronic Public Procurement" *The Electronic Journal of eGovernment* Volume 3 Issue 3, pp 147-156, available online at www.ejeg.com
- Strauss. A, and Corbin. J, Basics of Qualitative Research: Grounded Theory Procedures and Techniques, SAGE Publications, Newbury Park, CA, 1990.
- Streeter, C.L. and. Gillespie, D.F "Social networking analysis", Journal of social service research, 1992, Vol. 16, Nos. 1/2, pp. 201-222.
- Tan, C.W. and Pan, S.L., "Managing e-transformation in the public sector: an eGovernment study of the inland revenue authority of Singapore (iras)", European Journal Information Systems, 2003, Vol. 13, No. 4, pp. 139-165.
- The Economist, "The road to eDemocracy", A Survey of Technology and Government, The Economist Historical Archive 1843 to 2006.
- Twigg, J. "The age of accountability? Future community involvement in disaster reduction", Australian Journal of Emergency Management, 1999, Vol. 14, No. 4, pp. 51-58.
- Zinner Henriksen, H. and Damsgaard, J. "Dawn of eGovernment-an institutional analysis of seven initiatives and their impact", Journal of Information Technology, 2007, Vol. 22, No. 1.

An Exploratory Study on eGovernment Systems Success in Saudi Arabia

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Abstract: The evaluation of information systems (IS) has been of great interest to researchers in the last few decades. However, a limited number of studies have been conducted on the assessment of eGovernment systems success. eGovernment improves services and efficiency and assists in building trust between governments and the public. The importance of evaluating eGovernment systems comes from the need of governments to ascertain what investments in the delivery of services using eGovernment systems via Information and Communication Technology (ICT) are appropriate. The aim of this research is to explore the main aspects and factors for evaluating eGovernment systems success. The study has been conducted in the context of the Saudi government. This government has invested heavily in ICT infrastructure and eGovernment systems in the last decade. This huge investment reflects the ambition of the government to exploit the advantages of using eGovernment systems to deliver government services to the public via ICT. Accordingly, the Yesser Program was established in 2005 as an eGovernment initiative in conjunction with the Communication and Information Technology Commission (CITC) and the Ministry of Finance (MoF). To achieve the aim of this study, interviews were conducted with 49 Saudi citizens to explore their perceptions of eGovernment systems and their success. The interviewees who participated in our study were varied in their demographic information. The responses of the interviewees will help to identify the success factors of eGovernments systems and establish a preliminary framework for evaluating eGovernment success. The study objectives have been achieved and the findings reveal many issues regarding the factors that affect eGovernment systems success.

Keywords: eGovernment, ICT, Saudi Arabia, eGovernment evaluation, eGovernment success factors

1. Introduction

In the last ten years, most governments have invested heavily in eGovernment services to be delivered electronically to beneficiaries (Vintar and Nograšek, 2010). However, levels of acceptance by users are still low and not satisfactory (Hung et al., 2006). eGovernment improves services, and efficiency and assists in building trust between citizens and governments (Lee et al., 2005; Department of Economic and Social Affairs, 2010). It is natural that governments need to know how well they invest in eGovernment systems and what the perceptions of the beneficiaries might be of these systems.

The Saudi government has invested heavily in ICT infrastructure and eGovernment systems in the last decade. This huge investment reflects the ambition of the government to exploit the advantages of using eGovernment systems to deliver government services to the public via ICT. Accordingly, the Yesser program was established in 2005 as an eGovernment initiative in conjunction with the Communication and the Information Technology Commission (CITC) and Ministry of Finance (MoF).

The aim of this research is to explore the main factors for evaluating eGovernment systems success. To achieve this aim, semi-structured interviews were conducted with 49 Saudi citizens to explore their perceptions of eGovernment systems and their success. The interviewees who participated in our study were varied in their demographic information. The responses of the interviewees will help to identify the success factors of eGovernment systems and establish a preliminary framework for evaluating eGovernment success.

This paper is divided into six main parts: the first part is the introduction. The second part provides some background information about our study. The third part presents the research methodology followed in this study. The fourth part analyses and discusses our findings. The final part concludes.

2. Research background

eGovernment is a type of information system (IS) developed using Information Technology (IT). In the field of IS research, IS success as a concept is accepted widely and agreed to be the principal criterion to evaluate IS (Rai et al., 2002). However, academic researchers are struggling to develop a comprehensive framework which best evaluates IS success. DeLone and MacLean (2003) provide in

depth insights into the problem of IS success by stating “The multidimensional and interdependent nature of IS success requires careful attention to the definition and measurement of each aspect of this dependent variable. It is important to measure the possible interactions among the success dimensions in order to isolate the effect of various independent variables with one or more of these dependent success dimensions”. Researchers have conducted many studies to tackle the multi-disciplinary problem in the context of IS. Irani *et al.* (2005) encourage organisations to develop interpretivist models for IS evaluation rather than using only financially-based ones.

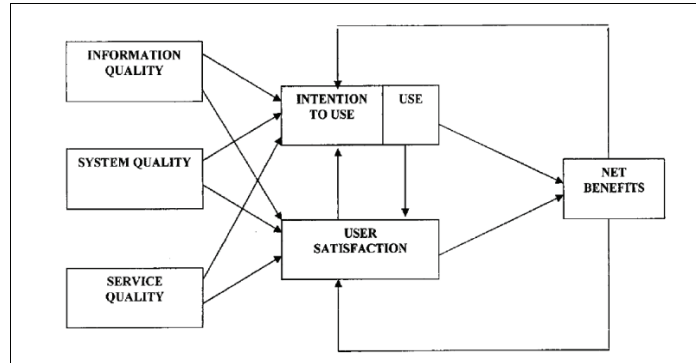


Figure1: Updated IS success model (DeLone and McLean, 2003)

The number of internet users in the Gulf Commission Countries (GCC), and particularly in Saudi Arabia, has increased dramatically in the last decade. The number of users in Saudi Arabia in 2000 was 200,000 (0.9% of the population), whereas this number has steeply increased in 2010 to 9,800,000 users which is 38.1% of the population (Internet World Stats, 2010). This leads to a fertile environment for Saudi Arabia and other GCC governments to invest and promote eGovernment services to the public.

This is tangible when looking at the number of eGovernment services that are currently offered by Saudi government agencies and are available at the hub of Saudi government sites (www.saudi.gov.sa). Users can load up and instantly get access to all the government eServices and websites. The number of these eGovernment services has reached around 1000 eServices, delivered by 126 government agencies in accordance with the Yesser Program's Assistant Director General (Alriyadh Information Technology, 2010).

The Saudi government has already invested about \$800 million in developing eGovernment systems (AMEinfo, 2006). This huge investment is a strong indicator of their commitment towards eGovernment. For this reason, evaluation of eGovernment systems can be a crucial aspect in the return of this huge investment. In addition, there is a necessity for a comprehensive framework to enforce standards in order to evaluate and measure the advantages that eGovernment can provide to the citizens, agencies, and society (Hu *et al.*, 2005). Given the huge investments, more attention is being paid to learning whether these investments deserve the value of that money (Irani *et al.*, 2008).

A literature review reveals that limited theoretical and empirical studies have been carried out to systematically evaluate the success of eGovernment systems. In particular, only a limited number of studies have been carried out in the context of developing countries, Middle East countries, and in particular GCC. Therefore, the goal of this study is to enhance our understanding of factors that influence the success of eGovernment systems.

3. Research methodology

In our study, the qualitative data was collected using the semi-structured interview method. The participants in this study are all Saudi nationals. They have been encouraged to be honest in referring to their personal experiences, opinions, and insights about eGovernment systems in Saudi Arabia. The responses have been quantified to capture the frequency of different factors (Ghauri and Gronhaug, 2010). Responses to the interview questions will help to reshape DeLone and McLean's (2003) model; alternative models can also be deployed as constructs and measures for establishing a comprehensive framework to evaluate eGovernment systems success.

The main purpose is to elicit answers to a variety of questions related to the issues of developing a framework for evaluating eGovernment success. These questions seek demographic information,

attitudes, personal experiences, and opinions of the targeted interviewees towards eGovernment portals in Saudi Arabia.

The data have been collected from different interviewees who vary demographically and have different backgrounds and qualifications. These interviewees are all employees, ranging from normal internet users to advanced developers, and of different managerial levels. They all work in the private and public sectors in Saudi Arabia. The main issues that have been discussed in this exploratory study were the perception of citizens towards eGovernment in Saudi Arabia, and what factors are most important to the interviewees when they critically evaluate the eGovernment systems. The participants provided their insights regarding these issues and how they conceptualise the success of eGovernment.

4. Research design

This exploratory study intends to provide a better understanding about eGovernment in Saudi Arabia in general and to address what factors can be used to evaluate eGovernment systems success. Exploratory research can be conducted for different reasons: to better understand the problem, to examine if future research is feasible by exploring various aspects related to research in detail, and to further highlight the problem (Hart, 2006).

The interviewees are persons who live in Saudi Arabia and work in different positions in public or private sector organisations. These interviewees have fair knowledge about eGovernment in Saudi Arabia and they have experience of using electronic services of eGovernment systems.

The aim of this exploratory study is to investigate the citizens' perception about factors and measures affecting the success of eGovernment systems in Saudi Arabia. The following objectives were formed to achieve the aim of this study:

- To extract demographic information of interviewees.
- To better learn how well the eGovernment initiative program in Saudi Arabia is known by citizens.
- To elicit the impression of the interviewees towards eGovernment services and how they rate them (highly successful/ less successful), and why.
- To know what the factors of "eGovernment success" are from the perspective of the users.
- To learn how to measure the proposed dimensions of eGovernment success.
- To find out what advantages/ benefits users are expecting when using eGovernment portal services.
- How to make government portals beneficial and worthy of usage.
- How to measure user satisfaction when using eGovernment portal services, and how to enhance this satisfaction.

In order to achieve the above objectives, the following questions were proposed to elicit the opinions, personal experiences, and insights/ thoughts. Each question is related to one or more objective(s). Table 1 lists the questions and relevant objectives.

5. Data analysis and discussion

The following sections highlight the findings and interpretations based on respondents' answers. Qualitative data analysis software, NVivo 8.0, has been used to analyse the interview data. We analyse the data and discuss findings in the following sections.

5.1 Overview of the interviews

As described in Table 1, the interview questions were based on certain objectives set to achieve the aim of this study. The questions that were asked of the interviewees were translated into the Arabic language, the native language of all participants. Using the native language in interviews confirms clarity of understanding questions and ensures that accurate responses are received. The participants in this study agreed to be interviewed voluntarily, considering that their names will not be requested and their employers' details will not be published.

Table1: Interview questions related to the study objectives

Interview Question No.	Question	Objective/(s)
1,2,3 and 4	Age, degree, job category, and sector?	1
5	Do you have an idea when the Yesser programme (Saudi Arabian eGovernment initiative) was founded? Which commission did the Yesser programme report to?	2
6	What is the most successful eServices sector in Saudi Arabia (i.e. eGovernment, e-banking, e-commerce, e-learning)? Why is it a success?	3
7	How would you rate eGovernment portals in Saudi Arabia? (In a few words, what makes it highly successful or less successful?)	3
8	Can you give an example of one of the eGovernment portals in Saudi Arabia that you think is highly successful? Why?	4
9	Can you give an example of an eGovernment portal that you think is less successful? Why?	4
10	From personal experience and also your opinion, what are the factors that may lead to successful eGovernment portals in Saudi Arabia?	4, 5
11	As a citizen, what do you imagine that eGovernment can facilitate to you in the near future? What are the benefits you expect to gain?	6
12	Currently, do you prefer to use the available eGovernment services provided by government portals or to visit them in their offices? Why?	3
13	What things make you confident about and give you the incentive to re-use eGovernment portals?	7
14	How can the eGovernment services in Saudi Arabia enhance users' satisfaction?	8

5.2 Demographic information

Table 2 shows the interviewees' demographic information based on their answers to the first four interview questions. All the interviewees are Saudi nationals. They are all employees, working in various organisations. This will enrich our study with a wealth of information since these interviewees are all of the legal age to request eGovernment services and directly interact with the government via their portals.

Table 2: Demographic information of interviewees

Characteristic	Group	Percentage (n=49)
Age	20-29	28.57%
	30-39	40.90%
	40-49	18.37%
	50 years and more	8.16%
Qualification	Diploma	20.41%
	Bachelor	69.39%
	Master	10.20%
Job Category	Administrator	16.33%
	Budget Analyst	2.04%
	Financial Analyst	2.04%
	Engineer	14.29%
	IT Specialist	34.69%
	Teacher	4.08%
	Technician	2.04%
	Manager	24.49%
Sector	Private	42.86%
	Public	57.14%

5.3 eGovernment awareness in Saudi Arabia

Similar to other developing countries, Saudi Arabia established their national eGovernment programme in 2005 and named it "Yesser". "Yesser" is an Arabic word that means "to simply

facilitate". The main goal for this programme is to enhance the delivery of services and increase the participation of the public through the utilisation of ICT.

The interview findings showed that 86% had no idea of when the Yesser programme was introduced by the government to the public or to which government agency this programme belongs. The majority of this number replied that they did not know. A few of them gave incorrect answers or said they had some information but were not sure. This may imply that there was a lack of introduction of this programme via the local media to the public. This may also affect the knowledge of the public about the benefits and advantages of utilising eGovernment services. In addition, the Yesser programme may need to widely promote and advertise itself in cross-media advertisements.

One of our interviewees commented on the eGovernment programme in Saudi Arabia: "I have only an idea through one of my friends who is interested in the matters of eGovernment, but not via media or journalism". Introducing eGovernment services and their advantages to the public is an essential step for any eGovernment initiative to be successful. This should be part of the eGovernment strategy under the development of a marketing and communications plan (Lowery, 2001).

5.4 Perceptions towards Saudi eGovernment systems

Only 84% of respondents answered our question about rating eGovernment portals in Saudi Arabia. 43% of the participants expressed negative views towards eGovernment systems in Saudi Arabia. They commented that eGovernment portals are not good and are below the average of their expectations. 14% of respondents rated eGovernment systems as average, 12% rated them as good, 4% were neutral, 8.16% said that eGovernment portals vary in the level of development, and only 2.04% expressed a very positive view and said that they are very good.

In answer to the question about what makes Saudi eGovernment portals highly successful, participants gave many replies. Most of the frequent answers were related to completeness and communication. 29% of participants commented that eGovernment portals should include all services provided by government agencies. 22% pointed out that good information quality will lead to greater success of eGovernment portals in Saudi Arabia, and 20% said that ease of use is an important factor for greater success. In addition, providing interactive services and having good system quality were proposed by some other interviewees.

The Saudi Ministry of Interior was appointed by 33% of our participants as the most successful eGovernment portal. Participants stated different reasons for their selection. The delivery of a variety of eServices through the Ministry of Interior portal was one of the repeated answers given by the participants. According to one participant commenting about this reason, "They provide many eServices that you can receive where you sit in your home/ office".

On the contrary, opinions varied about the least successful eGovernment system. Many organisations were given as examples of less successful portals. However, it was agreed by 11% of participants that most eGovernment portals are less successful, and another 11% agreed that the Ministry of Civil Affairs is less successful than the others. Different reasons were given for the latter selection: ineffective eServices, clients needing to visit the office to receive the services, poor quality of feedback/ reply when interacting with this agency and poor system quality.

Despite the fact that many respondents expressed negative views, 73% of participants preferred to use the current available eGovernment services. The frequent reason for this preference was to save time and effort. Other reasons given were that the cost of receiving eServices is cheaper than receiving traditional services, users can apply from anywhere and avoid transportation congestion, and the possibility of corruption when visiting offices to receive services face-to-face can be avoided.

5.5 The best eServices provider in Saudi Arabia

It was found that 100% of interviewees nominated banks as the best eServices provider in Saudi Arabia. An indication for the banks' success was captured by this participant: "In Saudi Arabia, I would consider the banks to be the best in providing eServices. They provide most of their services online. The user does not need to visit the branch at any stage to complete the service. Banks' eServices are featured with good security and they assure their customers that no one will be able to impersonate their identities. However, Banks' eServices may need further development and improvements to

reach the level that some eServices can be 100% delivered online (e.g. pay regular invoices, transfer regularly fixed amounts of money automatically)". Another participant commented: "Banks are pioneers in providing eServices in Saudi Arabia. Their success has accumulated for more than ten years. Other sectors such as public sector have failed to provide eServices with the same good quality as the banks and as we may see and experience in other advanced countries".

5.6 Factors to evaluate eGovernment success

Participants demonstrated various opinions regarding the factors to evaluate the success of eGovernment systems. In response to question (10), participants explained the factors which may lead to successful eGovernment systems in Saudi Arabia.

It is noteworthy that interviewees provided their answers without distinguishing between dimensions, factors and measures as they have been identified in the literature. For example, "ease of use" is a measure of "system quality" (Petter et al., 2008). Information quality, system quality, and service quality, as the three quality dimensions of DeLone and MacLean's (2003) model, have been ranked highly by the participants. Moh'd Al-adaileh (2009) used user's technical capability, which is consistent with computer literacy, as one of the dimensions and found that it has a significant impact on the evaluation of IS success. Privacy and security issues are crucial and repeated issues that have been studied in eGovernment research (Belanger and Hiller, 2006). In the US, the eGovernment Act of 2002 considers the maintenance of security and privacy as important pillars of eGovernment (Lee et al., 2005). Availability and ease of use are two validated measures that belong to information quality and system quality accordingly (Sedera and Gable, 2004). All of these factors and measures will be considered in our future study when establishing a comprehensive framework for eGovernment evaluation. Table 3 lists the proposed factors that may result in eGovernment systems success.

Table 3: Factors to evaluate eGovernment systems success

No.	Factor	Frequency (n=49)
1	Good information quality	63.27%
2	Computer literacy	57.14%
3	Good system quality	55.10%
4	Maintaining security	48.98%
5	Maintaining privacy	46.94%
6	Good service quality	44.90%
7	Ease of use	30.61%
8	All services have to be delivered online	16.33%
9	Continuous update of content	12.24%
10	Receive the eGovernment service completely online	10.20%
11	Good feedback and quick response to users	10.20%
12	Transparency	8.16%
13	Continuous system upgrade	8.16%
14	Unified signing-up/ in for all government agencies	6.12%
15	Good website design	6.12%
16	Accessibility	6.12%
17	Availability	4.08%
18	Help should be provided interactively when receiving eGovernment services	4.08%
19	Technical support	4.08%
20	Dual language – native language and English	4.08%
21	Staff who develop/ support eGovernment services should have good experience	4.08%
22	Obtain the requirements of beneficiaries regularly	4.08%
23	Other factors	8.16%

5.7 Net benefits of using eGovernment

eGovernment systems, like any other type of IS, have certain impacts on users. Net benefits as one of the IS success dimensions was first introduced by DeLone and MacLean in 2003. They argue that, instead of complicating their proposed model in that year, combining all the net benefits into one

dimension was a good idea. Plenty of reasons were given by interviewees to express the benefit of using eGovernment systems. 69.39% of participants supported that using eGovernment systems will make their life easier, saving them time and money. One participant commented about the benefits of using eGovernment systems: "using eGovernment systems will enhance the quality of our life by saving us effort, time and money". 18.37% of respondents found it is an advantage when clients do not need to visit the public sector offices to receive services. One comment was: "the crucial thing is to enable clients to receive eServices completely without visiting public sector offices". 18.37% of interviewees believed that using eGovernment systems will mitigate the problem of traffic jams and will make the transportation systems less congested.

5.8 Factors affecting user satisfaction

Various reasons and aspects were given by our interviewees regarding user satisfaction. The factor which was mentioned most often is that all services provided by government agency have to be delivered online in the electronic portal. This means that users would prefer to receive services while they sit at home or in the office and they do not want to visit governmental offices. 39% of participants assured that delivering all services that belong to a particular government agency to their electronic portal on the web will lead to user satisfaction. One of the participants commented: "All the services have to be transformed to electronic form and have to be delivered to clients online". 27% nominated "ease of use" to be one of the factors that will result in user satisfaction.

24.49% mentioned that eServices have to be completed online throughout eGovernment portals. Precisely, they meant that users of eGovernment services should not be in a situation which requires them to visit the office to complete receipt of the service. According to one of the respondents, "The eGovernment service has to be completely achieved via the portal. The user should not at any stage need to visit the office. For instance, the delivery of national identification cards requires the user to visit the office of Department of Civil Affairs to receive it. However, this card can be posted by mail".

22.45% of participants believed that having interactive eServices will increase the satisfaction of users. Various interpretations of having interactive eServices were given by the interviewees. One participant interpreted interaction as: "increasing the number of staff to support the clients or developing an intelligent system to respond to clients requests and intelligently interact with them online". Another interviewee had different views about interaction: "There must be some means to interact with clients by sending them confirmations about the status of their requests. Clients should also be capable to trace the status of their requests online or by mobile phones". Interaction was also understood by one participant as receiving responses to inquiries and being able to send feedback to governmental agencies: "The eGovernment portal has to act as a governmental agency office. There should be interaction means to facilitate inquiry and feedback".

5.9 Factors affecting intention to use

Wu and Wang (2006) identify Intention to use as "a measure of the likelihood a person will employ the application". Intention to use is a significant dimension as well as a quality dimension since the latter affects attitudes of IS users (Wu and Wang, 2006). Participants gave different responses as to the reason for their intention to use eGovernment systems. Table 4 shows the factors that interviewees felt influenced their intention to re-use eGovernment services. It reveals that these factors are similar to the factors mentioned in Section 5.6, "Factors to Evaluate eGovernment Success". This means that the responses are consistent to some extent and there is a good level of agreement towards the applicability of using these factors to evaluate eGovernment success.

6. Conclusion

This research paper explored the main aspects and factors for evaluating eGovernment systems success. Findings from this exploratory study can help future researchers to develop a better understanding of the success of eGovernment systems. Many factors proposed by this study to influence the success of eGovernment systems converge with the core quality dimensions of DeLone and McLean's IS success model (2003). Information quality, system quality and service quality were among the top ten factors that affect eGovernment success, as nominated by respondents. In previous studies the IS success model of DeLone and McLean (2003) has proven to be a useful theoretical framework to help understand and explain IS success. This model has been examined in many empirical studies on IS success using various instruments which have proven to produce reliable results.

Table 4: Factors influencing the intention to re-use eGovernment services

No.	Factor	Frequency (n=49)
1	All eServices are available online. No need to visit the office to complete transactions	51.02%
2	Good service quality	30.61%
3	Ease of use	30.61%
4	Save time and effort	22.45%
5	Good information quality	14.29%
6	Good response to clients	12.24%
7	Good system quality	12.24%
8	Credibility in providing eServices	10.20%
9	Mechanisms to trace the status of requests	6.12%
10	Interaction	6.12%
11	Careful consideration of user requirements	6.12%
12	Security	6.12%
13	Others	8.16%

Other factors which were highly ranked by the participants were: computer literacy, security, privacy, ease of use, continuous update of contents, the online delivery of all services and the ability to complete eGovernment services online without the need to visit the government agency office at any stage of receiving services. These factors have been widely discussed in the literature surrounding IS and its application (i.e. e-commerce, e-learning, etc).

All participants regarded the online banking services as the best eServices that they interact with in Saudi Arabia. This does not necessary mean that online banking in Saudi Arabia has reached perfection. However, it may be worth conducting future research to investigate what makes online banking in Saudi Arabia the best e-service. Other e-service providers, such as e-commerce and e-learning, may be also considered, to investigate all the possible success dimensions that are applicable to eGovernment. The findings of such research into online banking and other IS applications may assist eGovernment researchers and practitioners to examine such factors in the context of eGovernment.

Despite negative views being expressed by 43% of participants towards eGovernment services in Saudi Arabia, 73% of participants still said they would prefer to receive eGovernment services rather than visit the government agency office to receive the service in a traditional way. Governments should exploit this thirst for eGovernment systems by enhancing online services, and could base the evaluation of these services on comprehensive frameworks such as the IS success model.

This study has other limitations. Firstly, the selection of participants was not random, as convenience sampling was used due to the time restrictions for collecting data, and thus the findings may not be representative. However, it is a good basis for future research. The production of more general findings would need a systematic sampling procedure with a larger sample. Secondly, the factors proposed in this study are related to a particular culture. Further cross-cultural research using samples from different GCC/ Middle East countries would be required for concrete generalisations of findings.

References

- Alriyadh Information Technology. 2010. *1000 Electronic Service Offered by the Saudi Portal for 126 Governmental Entity on the Internet* [Online]. Alriyadh Newspaper. Available: <http://www.alriyadh.com/2010/09/27/article562927.html> [Accessed 30 November 2011].
- Ameinfo. 2006. *Saudi Investment in EGovernment Tops Sar 3 Billion* [Online]. AMEinfo, The ultimate Middle East business resource. Available: <http://www.ameinfo.com/94409.html> [Accessed 25 November 2011].
- Belanger, F. & Hiller, J. S. 2006. A Framework for EGovernment: Privacy Implications. *Business Process Management Journal*, 12, pp. 48-60.
- Delone, W. H. & Mclean, E. R. 2003. The Delone and Mclean Model of Information Systems Success: A Ten-Year Update. *J. Manage. Inf. Syst.*, 19, pp. 9-30.
- Department Of Economic And Social Affairs 2010. *United Nations EGovernment Survey 2010: Leveraging EGovernment at a Time of Financial and Economic Crisis*, United Nations Pubns.
- Ghuri, G. & Gronhaug, K. 2010. *Research Methods in Business Studies*, Pearson.
- Hart, C. 2006. *Doing a Literature Review: Releasing the Social Science Research Imagination*, Sage P.47.
- Hu, Y., Xiao, J., Pang, J. & Xie, K. 2005. A Research on the Appraisal Framework of EGovernment Project Success. *Proceedings of the 7th international conference on Electronic commerce*. Xi'an, China: ACM.

- Hung, S.-Y., Chang, C.-M. & Yu, T.-J. 2006. Determinants of User Acceptance of the EGovernment Services: The Case of Online Tax Filing and Payment System. *Government Information Quarterly*, 23,pp. 97-122.
- Internet World Stats. 2010. *Saudi Arabia Internet Usage and Marketing Report* [Online]. Available: <http://www.internetworldstats.com/me/sa.htm> [Accessed 29 November 2011].
- Irani, Z., Love, P. E. D., Elliman, T., Jones, S. & Themistocleous, M. 2005. Evaluating EGovernment: Learning from the Experiences of Two UK Local Authorities. *Information Systems Journal*, 15,pp. 61-82.
- Irani, Z., Love, P. E. D. & Jones, S. 2008. Learning Lessons from Evaluating Egovernment: Reflective Case Experiences That Support Transformational Government. *The Journal of Strategic Information Systems*, 17,pp. 155-164.
- Lee, S. M., Tan, X. & Trimi, S. 2005. Current Practices of Leading EGovernment Countries. *Commun. ACM*, 48,pp. 99-104.
- Lowery, L. M. 2001. Developing a Successful EGovernment Strategy. *San Francisco, Department of Telecommunications & Information Services*.
- Moh'd Al-Adaileh, R. 2009. An Evaluation of Information Systems Success: A User Perspective-the Case of Jordan Telecom Group. *European Journal of Scientific Research*, 37,pp. 226-239.
- Petter, S., Delone, W. & Mclean, E. 2008. Measuring Information Systems Success: Models, Dimensions, Measures, and Interrelationships. *European Journal of Information Systems*, 17,pp. 236-263.
- Rai, A., Lang, S. S. & Welker, R. B. 2002. Assessing the Validity of IS Success Models: An Empirical Test and Theoretical Analysis. *Information Systems Research*, 13,pp. 50-69.
- Sedera, D. & Gable, G. G. Year. A Factor and Structural Equation Analysis of the Enterprise Systems Success Measurement Model. In: *Proceedings of the Twenty-Fifth International Conference on Information Systems*, 2004 Washington, DC, USA. Association for Information Systems, p449.
- Vintar, M. & Nograšek, J. 2010. How Much Can We Trust Different EGovernment Surveys? The Case of Slovenia. *Information Polity: The International Journal of Government & Democracy in the Information Age*, 15,pp. 199-213.
- Wu, J.-H. & Wang, Y.-M. 2006. Measuring Kms Success: A Respecification of the Delone and Mclean's Model. *Information & Management*, 43,pp. 728-739.

Platform as a Service API Ontology

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Abstract: Many organizations from the public and the private sector are planning to turn to Cloud Computing services, whose main benefits are flexibility, pay-per-use model and significant cost reduction. However, this new business paradigm for the provision of computing infrastructure has certain obstacles, including provider lock-in. When a client chooses a specific Cloud service provider, he also gets the provider's specific protocols, standards and tools, making a potential future migration complex and costly. Cloud Computing is still immature, with no firmly established standards governing all the aspects of its utilization. The migration issue can be overcome by using interoperable Cloud services. In this paper we focus on the platform as a service (PaaS) model of Cloud Computing. This model provides a complete computing platform needed to run applications over the Internet. Every PaaS provider (such as Google, Microsoft, Amazon and Salesforce) has specified its custom application programming interfaces (APIs). However, to achieve interoperability we need to develop a standardized set of APIs that constitute an interoperability platform. In this paper, we firstly present the key concepts and relevant related work from the existing literature. Thereafter we propose a novel PaaS API ontology to share a common understanding of the main concepts from providers' APIs. We used a prominent ontology development methodology to determine the domain and scope of our ontology, review similar existing ontologies, define the relevant classes and their hierarchy as well as to define the properties of classes and create their instances. The concepts in our ontology were derived from PaaS resources, remote Cloud functions specified in the API documentation of the most important PaaS solutions, existing Cloud ontologies, Cloud Computing models and standards for Semantic Web services. The aim of the proposed ontology is the description of PaaS resources and their operations. It was built using the Web Ontology Language (OWL) and the Protege tool. In the future, we plan to use this ontology to semantically annotate PaaS API operations and create a mechanism to determine and solve interoperability problems among two or more PaaS services provided by different vendors.

Keywords: platform as a service, interoperability, ontology, Cloud Computing

1. Introduction

Cloud Computing is primarily a new business paradigm whose main benefits are flexibility, pay-per-use model and significant cost reduction. The most comprehensive definition of Cloud Computing is that provided by NIST: "Cloud computing is a pay-per-use model for enabling available, convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications, services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" (in Linthicum 2009). Weinhardt et al. (2009) proposed a model to classify current Cloud services and pricing models. Their ontology consists of three layers: infrastructure as a service, platform as a service and application as a service. In our research, we focus on the platform as a service model. This model provides a complete computing platform needed to run applications over the Internet. However, there are some specific challenges that Cloud Computing involves: security and privacy, cloud provider control of the IT infrastructure, proprietary nature of the paradigm, and compliance issues. The most serious issue for many organisations is provider lock-in arising from the existence of specific protocols, standards and tools used by each Cloud service provider, which makes a potential future migration complex and costly. Lack of interoperability still presents a challenge to organizations interested in migrating their enterprise IT systems to the Cloud. In this paper, we propose a novel platform as a service (PaaS) API ontology to share a common understanding of the main concepts from providers' APIs. We plan to use this ontology to semantically annotate PaaS API operations and determine interoperability problems and their possible solutions among two or more PaaS services provided by different vendors. Ontologies are generally recognized as an essential tool for allowing communication, providing a semantically rich description and a common understanding of a specific domain. A great number of papers and ongoing research projects deal with ontologies for Cloud resources and services description. However, our ontology is more detailed than other approaches described in the literature and it is focused only on PaaS API resources and operations. The Semantic Web provides several modelling languages. In our paper we will use OWL 2, since this modelling language contains the concepts required for describing the functionalities of Cloud resources and API operations.

This paper proceeds as follows. First, in Section 2, we describe the related studies and ongoing research projects regarding Cloud Computing interoperability and Cloud resources and services

ontologies. In Section 3 we present the main steps in our PaaS API ontology development. Our conclusions are provided in the final section.

2. Interoperability and ontologies

Cloud Computing interoperability is a very active research topic that several ongoing research projects have been concerned with. The main objective of the FP7-funded Cloud4SOA project (Loutas et al. 2011) is to open up the Cloud market to small-medium European PaaS providers and treat the vendor lock-in problem. Cloud4SOA will semantically interconnect heterogeneous Platform as a Service (PaaS) solutions and facilitate the access of application developers to the PaaS offering that best matches their needs. Another FP7 project, mOSAIC, primarily aims at creating, promoting and exploiting an open-source Cloud API and platform targeted for designing and developing multi-Cloud-based applications. A full platform is expected to be finished in August 2012. The existence of standard APIs for programming Clouds can simplify the development process, increase the adoption of Cloud Computing services and enable the interoperability of data and services of different Cloud providers. The on-going FP7-funded Contrail project is aimed at designing an open source system for Cloud federations (Yegou, Artac, Temporale and Cascella 2011). The Contrail project key objectives are: to support the pay-per-use model, enable users to specify the quality of service requirements in the Service Level Agreements (SLAs) and to integrate elastic resource provisioning capabilities to the deployed applications. The FP7-funded Vision Cloud project is still at an early stage (Lorenz 2010). Vision Cloud will primarily be concerned with developing the architecture of a Cloud-based infrastructure to provide a scalable and flexible framework for optimised delivery of data-intensive storage services. Mohagheghi and Saether (2011) presented the achievements of REMICS, another on-going FP7 research project, in defining methodology and tools for model-driven migration of legacy applications to Cloud Computing. However, mentioned projects are not focused on commercial solutions for platform as a service and they do not plan to develop detailed PaaS API ontology.

There are also several published articles about Cloud Computing interoperability. Ajith and Maximilien (2009) described their own Altocumulus middleware to homogenize different Cloud solutions and the associated Cloud best practice model. Parameswaran and Chaddha (2009) claimed that there are two main Cloud Computing interoperability approaches. The first one is the unified Cloud interface, whose primary goal is to present an abstraction layer that is agnostic to any Cloud API. The second approach is an orchestration platform or layer to handle a federation of all kinds of Clouds. Merzky, Stamou and Jha (2009) demonstrated a proof-of-concept of application-level interoperability among different Clouds and Grids. Merzky, Stamou and Jha (2009) developed a range of Cloud adaptors for SAGA. Ranabahu and Sheth (2010) presented the usage of well established semantic technologies to overcome vendor lock-in issues in Cloud Computing. They distinguish four types of semantics for an application: data semantics (definitions of data structures, their relationships and restrictions), logic and process semantics (the business logic of the application), non-functional semantics (e.g. access control and logging) and system semantics (deployment descriptions and dependency management of the application). The reference architecture for semantically interoperable Clouds (RASIC) was proposed by Loutas et al. (2010). The architecture's main aim is to enable the design, deployment and execution of services on top of semantically interlinked Cloud Computing offerings. The model of a common Cloud API that consists of common concepts (image, instance, storage and network) was also defined in the aforementioned paper by Loutas et al. (2010). These initiatives and research efforts to address Cloud Computing interoperability mainly propose reference architectures or a simple proof-of-concept.

A great number of papers deal with ontologies for Cloud resources and services description. The first attempt to propose a Cloud ontology was presented by Youseff, Butrico and Da Silva (2008). In their paper the authors described an ontology which classifies Cloud services into five main layers: applications, software environments, software infrastructure, software kernel and hardware. Weinhardt et al. (2009) proposed a Cloud business ontology model to classify current Cloud services and their pricing models. This ontology consists of three layers: infrastructure, platform and application as a service. A formal catalogue representation of Cloud services was given in the paper by Deng et al. (2011), in which a range of Cloud services and their processes was modelled by means of ontological representation. The mOSAIC ontology concepts (Moscato et al. 2011) were identified by analyzing standards and proposals from the literature, while the ontology itself is aimed at semantic retrieval and composition of Cloud services. Bernstein and Vij (2010) presented their InterCloud Directories and Exchanges mediator to enable connectivity and collaboration among Cloud vendors. They defined their Cloud Computing resources ontology by means of the Resource

Description Framework (RDF). The main aim of RDF is to represent information about things (resources) that can be identified on the Web by using Web identifiers (Uniform Resource Identifiers or URIs). RDF uses a graph of nodes and arcs representing the resources, their properties and values (W3C 2004). A Cloud ontology which semantically defines the relationship among different Cloud services was proposed by Kang and Sim (2011). Their ontology is intended for determining the similarity among Cloud services. Dastjerdi, Tabatabaei and Buyya (2010) presented an architecture that uses ontology-based discovery to facilitate the deployment of virtual appliances on Cloud Computing services based on the users' definition of QoS requirements. Virtual appliances are sets of virtual machines including operating systems, needed configuration and ready-to-run applications. Ma, Schewe and Wang (2009) extended their model of Abstract State Services (ASSs) to a Cloud Computing paradigm. They proposed the Cloud formalism by federations of services and their description by means of ontology. These descriptions contain a technical description of services and keywords describing the application area and functionality of the annotated services.

Existing Cloud Computing ontologies are mostly general and detailed ontologies of each Cloud Computing layer (software as a service, platform as a service, infrastructure as a service) are still missing. This paper proposes a PaaS API ontology that will be used in the future to semantically annotate PaaS API operations and create a mechanism to determine and solve interoperability problems among two or more PaaS services provided by different vendors. The Semantic Web consists of a number of modelling languages that are organised in layers (Allemang and Hendler 2008). In our paper we will use OWL 2, since this modelling language contains the concepts required for describing the functionalities of Cloud resources and API operations. Web Ontology Language (OWL 2) is a logic-based language designed to represent rich and complex knowledge about things, groups of things, and relations among things. An ontology in OWL is "a set of precise descriptive statements about some part of the world (usually referred to as the domain of interest or the subject matter of the ontology)" (W3C 2009). Next section describes the PaaS API ontology development.

3. Cloud PaaS API ontology development

Bergam (2010) presented a brief review of the existing ontology development methodologies. Over the last twenty years a number of ontology development methods have been proposed. However, the pace of new methodology development has waned, which indicates that the process has reached the mature phase with limited improvement possibilities. Some of the leading methodologies are: Cyc, TOVE (Toronto Virtual Enterprise), IDEF5 (Integrated Definition for Ontology Description Capture Method), ONIONS (Ontologic Integration of Naive Sources), COINS (Context Interchange System), METHONTOLOGY, OTK (On-To-Knowledge), UPON (United Process for Ontologies) and Ontology Development 101. There is a general logical sharing of steps across most methodologies (from assessment to deployment, testing and improvement). An ontology development is an iterative approach through the entire lifecycle of the ontology. After we define an initial version of the ontology, we can evaluate it by using it in applications or methods. As a result, we will need to revise the initial ontology.

For the purpose of our research we selected the Ontology Development 101 methodology (Noy and McGuinness 2001). This methodology was devised at Stanford University, where the Protege tool (which we also used in our work) was developed as well. Developing an ontology includes defining classes in the ontology, arranging the classes in a taxonomic hierarchy, defining properties, describing allowed values for these properties and filling in the values for instances. The main steps in the ontology development process (Noy and McGuinness 2001) are: determination of the domain and scope of the ontology, reuse of existing ontologies, enumeration of important terms, definition of the classes and the class hierarchy, definition of the properties and creation of instances. In the following subsections we will explain each step of the methodology we used in the development of the ontology presented in this paper.

3.1 The domain and scope of the ontology

In this step we must limit the scope of the model. We determined representation of Cloud PaaS API resources and operations as the domain of our ontology. We intend to use this ontology to semantically annotate PaaS API operations and establish interoperability problems and their possible solutions among two or more PaaS services provided by different Cloud vendors. The information in the ontology should provide answers to following questions: What are the main resources of the

platform as a service model of Cloud Computing? What are the most important remote operations on PaaS resources?

3.2 Reuse of existing ontologies

Firstly we considered what other authors had done and checked if there was a possibility to refine and extend existing ontologies for the determined domain and scope. The most important previous work related to Cloud PaaS ontology is listed in section 2 of this paper. Some concepts from existing ontologies were reused in our ontology. There are several APIs that are used by existing PaaS services that we also analyzed. The most representative examples of PaaS APIs are discussed in Loutas et al. (2011). We also scrutinized the complete API references of Google App Engine and Salesforce.

3.3 Enumeration of important terms

A list of all important terms was written down in this step, without worrying about overlap among the concepts or considering whether the concepts were OWL classes or properties. Excel spreadsheets were used to list all relevant terms. The concepts in our ontology were derived from PaaS resources, remote Cloud functions specified in the API documentation of Google App Engine and Salesforce, aforementioned existing Cloud ontologies and standards for Semantic Web services such as OWL-S (Martin et al. 2004) and WSMO (Roman et al. 2007). OWL-S (Semantic Markup for Web Services) is the ontology of services that enable users and software agents to discover, invoke, compose, and monitor Web services (Martin et al. 2004). It has the three main parts: the service profile for advertising and discovering services (which specifies the intended purpose and functionalities of the service), the process model for a detailed description of a service's operation, and the grounding (which provides details on how to interoperate with a service). The Web Service Modelling Ontology (WSMO) is used for describing various aspects related to Semantic Web services (Roman et al. 2007) that is an extension of the Web Service Modelling Framework (WSMF). WSMO refines and extends this framework by developing the ontology for the core elements of Semantic Web services and the description language that consists of non-functional, functional, and behavioral aspects of a Web service.

3.4 Definition of the classes and the class hierarchy

From the list created in the previous step, the terms that describe independent objects were selected. These terms present classes in the developed ontology. In OWL classes are used to group individuals that have something in common and that represent sets of individuals (W3C 2009). A class can have subclasses that represent concepts that are more specific than the superclass, so the classes were organized into a hierarchical taxonomy. A combination of the top-down and bottom-up approaches was used to develop a class hierarchy. First salient concepts were defined, which were then generalized and specialised. For example, we started with a few top-level concepts such as *Operation*, and a few specific concepts, such as *RetrieveData*. We can then relate them to a middle-level concept, such as *DataOperation*. Then we generated all of the operation category classes, thereby generating a number of middle-level concepts. Figure 1 shows a part of the class hierarchy for the developed PaaS API ontology. This ontology was built by means of the Web Ontology Language (OWL) and the Protege tool.

Several OWL classes related to PaaS API resources were defined: Environment, Configuration, ProgrammingLanguage, Api, DataStorage, Service, ApplicationServer, PaaSProvider, Application, Queue, OperationException, Email, AccessController. Based on the complete API documentation of Google App Engine and Salesforce, seven categories of PaaS operations were described and defined by the following classes: PictureOperation, EmailOperation, AuthenticationOperation, QueueOperation, ServerOperation, DataOperation, EnvironmentOperation. The Google App Engine service enables the users to build and host Web applications on Google's infrastructure. The Salesforce Cloud platform is a similar service provided by Salesforce. Every class of PaaS operations category has a set of concrete subclasses. For example, Table 1 shows the subclasses of the DataOperation class along with their short description.

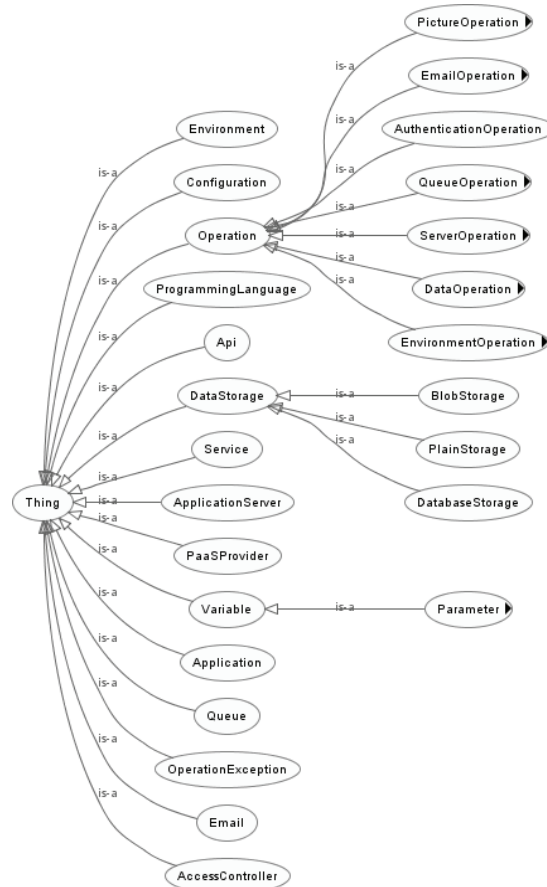


Figure 1: Section of the class hierarchy of the developed PaaS API ontology

Table 1: Data operation classes and their description

Data operation class	Description
CreateData	Adds one or more data elements.
DeleteData	Deletes one or more data elements.
UpdateData	Updates one or more existing data elements.
MergeData	Merges data of the same type.
QueryData	Executes a query and returns the data that matches the specified criteria.
RetrieveData	Retrieves one or more data elements based on the specified identifiers.
SearchData	Executes a text search of existing data.
GetDeletedData	Retrieves the identifiers of the recently deleted data.
GetUpdatedData	Retrieves the identifiers of the recently updated data.
BeginTransaction	Begins a transaction.
CommitTransaction	Commits the transaction.
RollbackTransaction	Rolls back the transaction.

The *Variable* class and its subclasses define input and output elements of the specified PaaS API operations.

In our future work we plan to review complete API references of other important PaaS providers (such as Microsoft, Amazon, Oracle and VMWare) and list other classes that will describe important remote PaaS operations defined in their Cloud offerings.

3.5 Definition of the properties

The properties of classes describe the internal structure of concepts. Properties specify how the instances of a class relate to other instances. Property cardinality defines how many values a property can have. Allowed classes for a property instance are called a range of a property. The classes to which a property is attached or classes which a property describes are called the domain of the property (Noy and McGuinness 2001). Instances can also be described by data values. For this purpose, OWL provides data type properties (W3C 2009) that relate instances to data values (instead

of relating them to other instances). A subset of defined properties, along with their corresponding domains and ranges of the PaaS API ontology presented in this paper, are shown in Table 2.

Table 2: Subset of defined properties in the developed ontology

Property	Domain	Range
hasDefault	Service	Environment
hasParameters	Operation	Input
hasResult	Operation	Output
isAccessedThrough	Application	AccessController
isDefinedIn	Operation	Api
isDeployedOn	Application	ApplicationServer
isDevelopedFor	Api	Service
isProvidedBy	Service	PaaSProvider
isSupportedBy	ProgrammingLanguage	Service
isThrown	OperationException	Operation
isUsedBy	Configuration	Environment

3.6 Filling in the values for instances

The last step in the methodology devised by Noy and McGuinness (2001) is creating individual instances of classes in the hierarchy, which was also applied in the Cloud PaaS ontology development. Defining an individual instance of a class requires choosing a class and creating an individual instance of that class. Figure 2 shows a list of individuals of the *Service* class. These individuals are real PaaS services provided by commercial vendors.

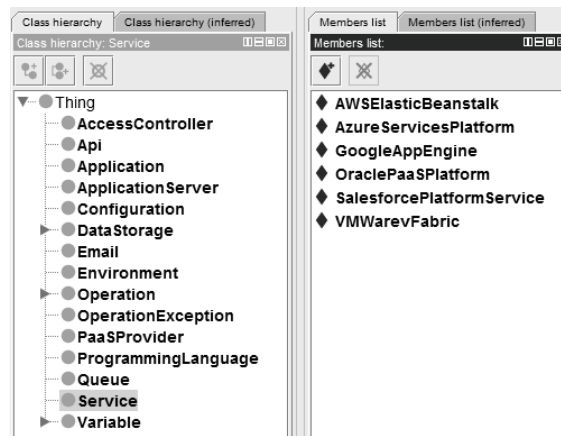


Figure 2: Members list of the *Service* class

We checked the logical consistency of the developed PaaS API ontology by means of the Pellet reasoner that checks hierarchies, domains, ranges, conflicting disjoint assertions and calculates the resulting inferred hierarchy and other properties.

4. Conclusion

In this paper, we have proposed a novel PaaS API ontology to share a common understanding of the main concepts from Cloud providers APIs. We used a prominent ontology development methodology (Noy and McGuinness 2001) to determine the domain and scope of our ontology, review similar existing ontologies, define the relevant classes and their hierarchy as well as to define the properties of classes and create their instances. This ontology describes the main resources of the platform as a service model and remote operations on PaaS resources. The concepts in our ontology were derived from PaaS resources, available remote Cloud functions specified in the current API documentation of Google App Engine and Salesforce, the existing Cloud ontologies mentioned in Section 2 and OWL-S standard (Martin et al. 2004). In our future work we plan to review the complete API references of other important PaaS providers (such as Microsoft, Amazon, Oracle and VMWare) and extend the ontology. Our ontology was implemented by means of the Web Ontology Language (OWL) and the Protege tool. A combination of the top-down and bottom-up approaches was used to develop the class hierarchy. We firstly defined salient concepts, which were subsequently generalized and specialised. Several OWL classes related to PaaS API resources (*Environment*, *Configuration*, *ProgrammingLanguage*, *Api*, *DataStorage*, *Service*, *ApplicationServer*, *PaaSProvider*, *Application*, *Queue*, *OperationException*, *Email*, *AccessController*) and operations were defined. In addition,

several categories of operations were defined: picture operations, e-mail operations, authentication operations, queue operations, server operations, data operations, environment operations. Such an approach made it possible to show the internal structure of concepts by defining properties of the classes. In the final step of ontology development individual instances of classes in the hierarchy were defined. Logical consistency of the developed ontology was checked by the Pellet reasoner.

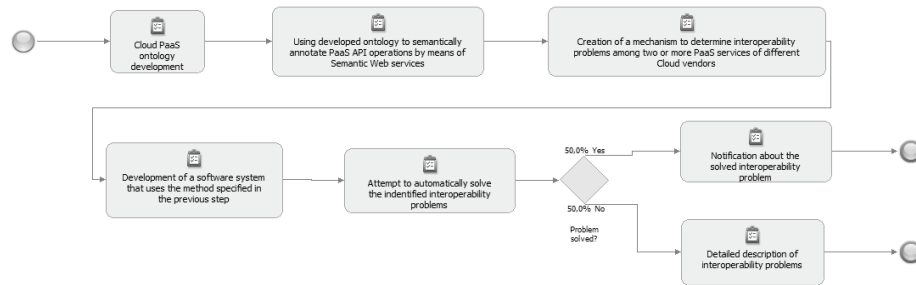


Figure 3: Outline of the planned steps in our future research

We plan to use the developed ontology to semantically annotate all PaaS API operations of major Cloud providers and create a mechanism to determine and solve interoperability problems among two or more PaaS services provided by different vendors. The quality of the developed ontology can only be tested by using it in applications that interoperate across Cloud boundaries, so we will develop a prototype of interoperable PaaS services that uses the ontology presented in this paper. Figure 3 outlines the basic planned steps in our future research.

References

- Ajith, R. and Maximilien, M. (2009) "A Best Practice Model for Cloud Middleware Systems", Proceedings of the Best Practices in Cloud Computing: Designing for the Cloud workshop in ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA), Orlando, pp 41-51.
- Allemang, D. and Hendler, J. (2008) Semantic Web for the Working Ontologist: Modeling in RDF, RDFS and OWL, Morgan Kaufmann Publishers, Boston.
- Bergam, M. (2010) "A Brief Survey of Ontology Development Methodologies", [online], <http://www.mkbergman.com/906/a-brief-survey-of-ontology-development-methodologies/>.
- Bernstein, D. and Vij, D. (2010) "Intercloud Directory and Exchange Protocol Detail Using XMPP and RDF", 2010 6th World Congress on Services (SERVICES-1), Miami, July, pp 431-438.
- Dastjerdi, A. V., Tabatabaei, S. G. H., and Buyya R. (2010) "An Effective Architecture for Automated Appliance Management System Applying Ontology-Based Cloud Discovery", 2010 10th IEEE/ACM International Conference on Cluster, Cloud and Grid Computing, Melbourne, May, pp 104-112.
- Deng, Y., Head, M. R., Kochut, A., Munson, J., Sailer, A., and Shaikh, H. (2011) "Introducing Semantics to Cloud Services Catalogs", 2011 IEEE International Conference on Services Computing, Washington, July, pp 24-31.
- Kang, J. and Sim, K. M. (2011) "Ontology and search engine for cloud computing system", 2011 International Conference on System Science and Engineering (ICSSE), Macao, June, pp 276-281.
- Linthicum, D. S. (2009) Cloud Computing and SOA Convergence in Your Enterprise: a step-by-step guide, Addison-Wesley, Boston.
- Lorenz, M. (2010) "Vision Cloud: The Fact Sheet", [online], <http://www.visioncloud.eu/content.php?s=30,47>
- Loutas, N. et al. (2011) "Cloud4SOA D1.1 Requirements Analysis Report", [online], <http://www.cloud4soa.eu/node/41>
- Loutas, N., Peristeras, V., Boura, T., Kamateri, E., Zeginis, D. (2010) "Towards a Reference Architecture for Semantically Interoperable Clouds", 2010 IEEE Second International Conference on Cloud Computing Technology and Science, Indianapolis, December, pp 143-150.
- Ma, H., Schewe, K.-D., and Wang, Q. (2009) "An Abstract Model for Service Provision, Search and Composition", APSCC 2009. Services Computing Conference, Singapore, December, pp 95-102.
- Martin, D. et al. (2004) "OWL-S: Semantic Markup for Web Services", [online], W3C, <http://www.w3.org/Submission/OWL-S/>.
- Merzky, A., Stamou, K., and Jha, S. (2009) "Application Level Interoperability between Clouds and Grids", Workshops at the Grid and Pervasive Computing Conference, Geneva, May, pp 143-150.
- Mohagheghi, P. and Saether, T. (2011) "Software Engineering Challenges for Migration to the Service Cloud Paradigm: Ongoing Work in the REMICS Project", 2011 IEEE World Congress on Services (SERVICES), Washington DC, July, pp 507-514.
- Moscato, F., Aversa, R., Di Martino, B., Fortis, T.-F. and Munteanu, V. (2011), "An Analysis of mOSAIC ontology for Cloud Resources annotation", Proceedings of the Federated Conference on Computer Science and Information Systems, Szczecin, pp 983-990.

- Noy, N.F., McGuinness, D.L. (2001) "Ontology Development 101: A Guide to Creating Your First Ontology", [online], <http://www-ksl.stanford.edu/people/dlm/papers/ontology-tutorial-noy-mcguinness.pdf>.
- Parameswaran, A. V., Chaddha, A. (2009) "Cloud Interoperability and Standardization", [online], <http://www.infosys.com/infosys-labs/publications/setlabs-briefings/Documents/cloud-interoperability-standardization.pdf>
- Petcu, D. et al. (2011) "D1.1 – Architectural design of mOSAIC's API and platform", [online], <http://www.mosaic-cloud.eu/dissemination/deliverables/FP7-256910-D1.1-1.0.pdf>
- Ranabahu, A. and Sheth, A. (2010) "Semantics Centric Solutions for Application and Data Portability in Cloud Computing", 2nd IEEE International Conference on Cloud Computing Technology and Science, Athens, pp 234-241.
- Roman, D. et al. (2007) "D2v1.4. Web Service Modeling Ontology (WSMO)", [online], <http://www.wsmo.org/TR/d2/v1.4/>.
- W3C (2004) "RDF Primer", [online], W3C, <http://www.w3.org/TR/2004/REC-rdf-primer-20040210/>.
- W3C (2009) "OWL 2 Web Ontology Language Primer", [online], W3C, <http://www.w3.org/TR/2009/REC-owl2-primer-20091027/>.
- Weinhardt, C., Anandasivam, A., Blau, B. and Stosser J. (2009) "Business Models in the Service World", IT Professional, Vol 11, No. 2, pp 28-33.
- Yegou, Y., Artac, M., Temporale, C., and Cascella R. (2011) "Contrail - First Specification of the System Architecture D10.1", [online], <http://contrail-project.eu/documents/18553/136157/D10.1.pdf>
- Youseff, L., Butrico, M. and Da Silva D. (2008) "Toward a Unified Ontology of Cloud Computing", GCE '08 Grid Computing Environments Workshop, Austin, November, pp 1-10.

What do we Know From the Literature on Public eServices?

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Abstract Public eServices are a broad and growing research field in which scholars and practitioners from different domains are involved. However, the increasing attention devoted to public eServices only partially captures the extreme variety of aspects and implications of the diffusion of information and communication technologies at all levels of public administrations. The paper aims to develop a meta-analysis of the literature on the delivery, diffusion, adoption and impact of public eServices and examines current research trends in terms of differences in methodologies, approaches and key indicators across five service categories: eGovernment, eEducation, eHealth, Infomobility and eProcurement. We examined 751 articles appeared in 2000-2010 in the top international academic journals listed in the SSCI-ISI. We highlight a significant heterogeneity in scientific production across service domains, indicators used, and affiliation of authors. We also show an increasing diffusion of quantitative methods applied to different research fields which still appears to be constrained by data limitations. The overall picture emerging from the analysis is one characterized by largely unexplored service domains as well as scarcely analyzed issues both across and within individual service categories. Thus many research opportunities seem to emerge and need to be exploited from different disciplinary perspectives in this field of analysis.

Keywords: bibliometrics; meta-analysis; public eServices

1. Introduction

We aim in this paper to analyze the pace and direction of research on public eServices over the past decade, and to identify key issues emerging from different streams of literature in this field. To pursue this set of objectives, we examined some 2,460 articles appeared in academic journals listed in the Social Science Citation Index (SSCI) of the Institute for Scientific Information (ISI) over the 2000-2010 period, as classified in the following fields: Communication, Economics, Education, Environmental Studies, Geography, Health Policy & Services, Information Science & Library Science, Law, Management, Planning & Development, Public Administration, Transportation and Urban Studies. Articles are classified according to the institutional affiliations of authors and co-authors, to the range of public eServices covered, and to the methodologies used. This overview should help identify research challenges and opportunities in the field.

The remainder of this paper is organized as follows. In the next section we briefly review relevant bibliometric studies which may help develop an appropriate framework for subsequent analysis of public eService literature. In section 3, 4 and 5 the research methodology used is outlined, and then the results obtained in the empirical research are analyzed. Finally, the main conclusions of this study are summarized and some questions on future trends in this area are highlighted for discussion.

2. Literature review

Over the past two decades, an extensive bibliometric literature has focused on such key methodological issues as the identification of the historical roots of a particular field of study (Bloomfield, 1979; Atkins, 1988), the prediction of future research trends (Löfstedt, 2005), the analysis of critical knowledge gaps (Webster and Watson, 2002).

These studies help discern the directions taken in a discipline, highlight possible inadequacies of analytical approaches, provide a crucial starting point for research, and greatly facilitate the enhancement of knowledge. In this direction Malone and Crowston (1994) provide an excellent example of a review work covering different areas like computer science, economics, operations research, organization theory, and biology. Löfstedt (2005) develops a map of some of the current research in the field of eGovernment and analyses how different aspects, methods and scientific approaches in the field are connected to each other, and this mirrors into extensive networks involving researchers from different research areas.

Thus, scholars focusing on eGovernment might have to rely on a variety of disciplinary backgrounds and their approaches may well differ depending on the starting point and on the problem domain chosen. This implies that constructing a review on Information Systems fields, and on Public eServices in particular, is a challenging process because we often need to draw on theories, methods and data from a variety of fields.

A critical issue is the quality of research as roughly captured by the impact factor of reviewed journals in which works appear (Plümper and Radaelli, 2004). Stalling and Ferris (1988) stated that highly rated journals were the most qualified locus of dissemination of academic research. Furthermore, they highlighted the excessive use of qualitative methods such as case studies and non-empirical research which might undermine the precision and objectivity of analyses. Although both quantitative and qualitative approaches contribute to knowledge accumulation, there is a clear need for more studies applying quantitative research methods rather than qualitative ones (Bailey, 1992).

Apart from the relatively numerous surveys on eGovernment (Grönlund and Andersons, 2006; Scholl, 2009; Grönlund, 2010), to the best of our knowledge there are very few works examining the literature on other public eServices. Our purpose is to fill in this gap and provide a thorough review of extant literature analyzing the development of the following public eService categories: eGovernment, eEducation, eHealth, Infomobility and eProcurement.

This work should thus yield a valuable overview of the current state of the art in this complex and multi-disciplinary research domain, and highlight methodological and analytical gaps to be filled in.

3. The selection of journals

While some bibliometrics studies focus on different research outputs, including doctoral dissertations, books or other sources of knowledge dissemination (Rice et al., 2002), we have preferred to restrict the analysis to academic journals (including e-journals), following a practice that is becoming more and more common in the literature (Braadbaart and Yusnandarshah, 2008).

As a starting point we used the Web of Science (the electronic version of the Social Sciences Citation Index) to identify articles in the leading journals that should be included in our review.

Because public eServices is an interdisciplinary field straddling multiple disciplines, our search was not circumscribed to journals classified by SSCI within the Information Systems discipline, but also extended the analysis to a number of other broad research fields. Table 1 lists all 56 research fields recorded in the Social Science Citation Index. In the same table we highlighted in bold characters the 14 fields which we deemed to be most relevant for a comprehensive review of extant publications on the development of public eServices.

Table 1: Total research fields in the Social Science Citation Index (SSCI - ISI)

Research field Name	1) Anthropology, 2) Area Studies, 3) Business, 4) Business - Finance, 5) Communication, 6) Criminology & Penology, 7) Demography, 8) Economics, 9) Education & Educational Research, 10) Education - Special, 11) Environmental Studies, 12) Ergonomics, 13) Ethics, 14) Ethnic Studies, 15) Family Studies, 16) Geography, 17) Gerontology, 18) Health Policy & Services, 19) History, 20) History & Philosophy Of Science, 21) History of Social Sciences, 22) Hospitality – Leisure – Sport & Tourism, 23) Industrial Relations & Labor, 24) Information Science & Library Science, 25) International Relations, 26) Law, 27) Linguistics, 28) Management, 29) Nursing, 30) Planning & Development, 31) Political Science, 32) Psychiatry, 33) Psychology - Applied, 34) Psychology – Biological, 35) Psychology – Clinical, 36) Psychology – Developmental, 37) Psychology – Educational, 38) Psychology – Experimental, 39) Psychology – 40) Mathematical, 41) Psychology – Multidisciplinary, 42) Psychology – Psychoanalysis, 43) Psychology – Social, 44) Public Administration, 45) Public - Environmental & Occupational Health, 46) Rehabilitation, 47) Social Issues, 48) Social Sciences – Biomedical, 49) Social Sciences – Interdisciplinary, 50) Social Sciences - Mathematical Methods, 51) Social Work, 52) Sociology, 53) Substance Abuse, 54) Transportation, 55) Urban Studies, 56) Women's Studies

For each of the 14 research fields identified in Table 1 we identified the top 30 journals as ranked by SSCI – ISI using objective criteria as the impact factor (Gordon, 1982), thus yielding a total of 408 periodic publications used as a basis for our research. Over the 2000-2010 period these journals published a total of 175,519 articles, which we scanned electronically by means of keywords, as illustrated in section 4 below (We conducted some random checks on journals not belonging to the 14

SSCI research fields selected from table 1, and ended up singling out a negligible number of articles which will eventually meet the scanning criteria described in section 4¹.

4. Search model and keyword selection

According to Webster and Watson (2002) "a systematic search should ensure that you accumulate a relatively complete census of relevant literature". To this end we conducted an iterative search process based on standard on-line library facilities (The on - line library services at the University of Urbino, Italy, were used as the main search platform). In particular, 11 leading journal databases accessible on-line were used to electronically scan journal articles published by the 408 periodic publications identified.

To identify relevant public eServices articles, a keyword search throughout full texts of the whole population of articles was conducted. Keywords included are the following: "e-government", "electronic government", "e-health", "electronic health", "health information systems", "e-education", "e-learning", "ICT in Schools", "transport information systems", "infomobility", "e-procurement", "electronic procurement".

The 2,460 articles selected through the procedure described above were further scanned to identify those publications that addressed issues relating to the adoption, impact, diffusion and delivery of public eServices, and separated them from those focused on implementation, technological development, modeling, and re-engineering aspects of public eServices. To do this, following a standard methodology (Plümper and Radaelli, 2004; Hartley and Kostoff, 2003), the title, abstract and keywords of the articles were examined.

Articles relating to the first set of research issues (adoption, impact, diffusion and delivery) were identified by checking whether in each of the publications selected up to this stage there existed one or more specific keywords, including inter alia the following: adoption and diffusion, benchmarking, social inclusion, readiness, front office, back office, on line availability/delivery, user participation, procurement strategies, logistics, intelligent transportation systems, intelligent/sustainable transportation, open learning environments/processes, internet-based learning, health services, local public health.

Following the same procedure, we identified articles relating to the second set of research issues (implementation, development and re-engineering) by checking whether in each of the articles selected up to this stage there existed one or more specific keywords, including inter alia the following: application repository, automation, B2B, business process modeling, G2G, ICT/IT architecture, information systems, infrastructure, interoperability, language technology/processing, ontologies, semantic web standards/technologies, service development, service oriented architecture, systems engineering, testing methodologies.

Taking into account the objectives of the research, we decided to focus our attention on the articles we identified as related to the first set of research issues (751 out of 2,460 = 29.53%), and did not consider at all the other articles that were mainly related to the second set of research issues (1,709 out of 2,460 = 70.47%). In fact, as suggested by Löfstedt (2005) in a similar context, the latter set of articles can be expected to be concerned exclusively or primarily with technical aspects, which are by and large beyond the scope of this review work.

Table 2 classifies the 751 articles on public-services published in the last ten years, as obtained from this scanning procedure, according to the main research fields they focus on. The most commonly covered fields are: Public Administration (41.9%) and Information and Library Systems (28.9%); while the least covered are: Transportation/Environmental and Urban Studies (5.1%), Education and

¹ We checked some research fields related to the 14 examined and we observed that there are several overlapping: Management with Business 33,33% (10 journals out of 30 total), Public Administration with Political Science 6,6% (2 journals out of 30 total), Public Environmental and Occupational Health with Health Policy & Services 13,3% (4 journals out of 30 total), Public Administration with Social Sciences – Interdisciplinary 6,6% (2 journals out of 30 total) Thereafter, we conducted some checks on the two journals with the highest impact factor in the research fields related (Business, Political Science, Public Environmental and Occupational Health, Social Sciences – Interdisciplinary) and we didn't find any article which meets the scanning criteria described in section 4.

Educational Research (4.8%), Management (2.8%)². Works on eGovernment and Infomobility have appeared in journals covering the widest range of research domains (four research fields out of six are involved). Hence they seem to have attracted scholars originating from the largest variety of disciplines.

Table 2: Articles on public eServices found in each SSCI - ISI research field (2000-2010)

Research field	Number and percentage of articles					
	total	eGovernment	eEducation	eHealth	Infomobility	eProcurement
Management	21 (2.8%)	10 (2.4%)	0	0	3 (6.3%)	8 (12.1%)
Information and Library Systems	217 (28.9%)	158 (37.5%)	2 (4.4%)	45 (26.3%)	6 (12.5%)	6 (9.1%)
Public Administration	315 (41.9%)	251 (59.6%)	9 (20.0%)	2 (1.2%)	1 (2.1%)	52 (78.8%)
Education and Educational Research	36 (4.8%)	2 (0.5%)	34 (75.6%)	0	0	0
Health Policy and Services	124 (16.5%)	0	0	124 (72.5%)	0	0
Transportation/Environmental and Urban Studies	38 (5.1%)	0	0	0	38 (79.2%)	0
Total	751 (100%)	421 (100%)	45 (100%)	171 (100%)	48 (100%)	66 (100%)

5. Empirical analysis

We found a strong heterogeneity in the availability of published articles on public eServices across different research domains (Table 3): eGovernment gathers more than half of all publications (56.06%) followed by a lower percentage from the eHealth domain (22.77%). Remaining domains (eEducation, Infomobility and eProcurement) gather less than 10% of total articles.

Given that our sample focuses on articles appeared in top journals, the average impact factor is obviously high (1.84). However, there are significant differences across service platforms, with journal impact factor spanning from 1.5 in the case of eEducation to more than 2 in the case of eHealth and eProcurement.

Table 3: General information on reviewed literature by public eService platform analyzed (2000-2010)

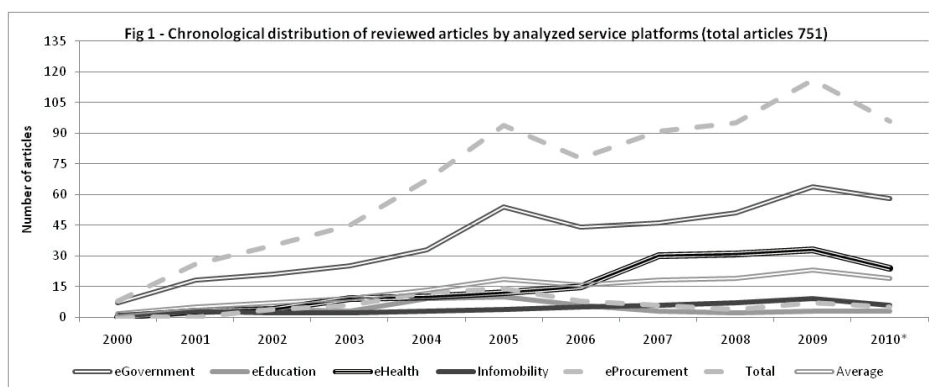
	Total	eGovernment	eEducation	eHealth	Infomobility	eProcurement
Total articles	751	421	45	171	48	66
Percentages	100.00	56.06	5.99	22.77	6.39	8.79
Average impact factor	1.84	1.85	1.56	2.04	1.73	2.02
Average number of co-authors	3.03	3.10	4.30	3.40	2.50	1.84

Figure 1 shows that the number of published articles steadily increased over the last ten years revealing a growing attention to public eServices field among researchers, with works on eGovernment platform/domain exhibiting the highest growth rates.

In Table 4 we see that the largest share of research studies on public eServices published in high impact journals is authored by scholars affiliated to European research institutions (43.54%), particularly those based in following countries: Belgium, Denmark, Finland, Germany, Greece, Italy, Spain, Sweden, The Netherlands and UK. Next, for numerical importance (35.15%) are researchers affiliated to institutions of North and South America. Scholars from institutions in Africa account for a very low share of total publications in this field (1.86%). Moreover, it is not unusual to see collaborations among researchers from universities located in different geographical areas. European researchers are the most involved in works on public eServices in collaboration with researchers from

² We combined three fields that had affinities (Environmental Studies, Transportation and Urban Studies) and we did not consider the research fields which did not publish any article on public eServices according to our scanning criteria described in section 4 (Communication, Economics, Education – Special, Geography, Law, Planning & Development). Thus, the final list of research fields changes from 14 to 6.

other continents (e.g. Europe + North and South America: 4.93%; Europe + Asia/Australia: 1.07%; etc).



*The survey considers only the first half of 2010

Figure 1: Chronological distribution of reviewed articles by analyzed service platforms (total articles 751)

Table 4: Geographical distribution of articles on public eServices, by institutional affiliation of authors and co-authors (absolute and percentage values)

	Total	eGovernment	eEducation	eHealth	Infomobility	eProcurement
Europe	327 (43.54%)	175 (41.57%)	24 (53.33%)	87 (50.88%)	17 (35.42%)	24 (36.36%)
North and South America*	264 (35.15%)	151 (35.87%)	12 (26.67%)	57 (33.33%)	8 (16.67%)	36 (54.55%)
Asia/Australia	80 (10.65%)	46 (10.93%)	6 (13.33%)	18 (10.53%)	10 (20.83%)	0
Africa	14 (1.86%)	2 (0.48%)	3 (6.67%)	9 (5.26%)	0	0
Europe + North and South America	37 (4.93%)	25 (5.94%)	0	0	6 (12.50%)	6 (9.09%)
Europe + North and South America + Africa	6 (0.80%)	6 (1.43%)	0	0	0	0
Europe + Asia/Australia	8 (1.07%)	5 (1.19%)	0	0	3 (6.25%)	0
Europe + Africa	3 (0.40%)	3 (0.71%)	0	0	0	0
North and South America + Africa	12 (1.60%)	8 (1.90%)	0	0	4 (8.33%)	0
Total	751 (100%)	421 (100%)	45 (100%)	171 (100%)	48 (100%)	66 (100%)
*USA, Canada and Latin America						

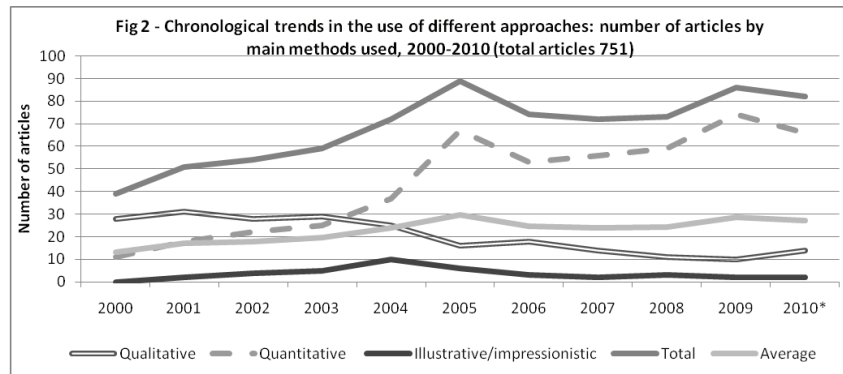
As illustrated in table 5, research on public eServices involves a heterogeneous academic community, with the greatest share of scholars belonging to departments of Law/Public Administration (34.35%) followed by Computer Science/Information Systems (25.70%), and by Health/life Sciences (16.51%). Table 5 also shows that researchers with different backgrounds specialise in different public eService platforms. For example, scholars affiliated to departments of Computer Science/Information System focus on eGovernment, while those belonging to departments of Communication/Education sciences pay greater attention to eEducation, those from institutions active in life Sciences specialise in research on eHealth, and those from departments of Environment/Geographical Studies focus on Infomobility. Scholars from departments of Law/Public Administration and of Economics/Management are active in research on both eGovernment and eProcurement. Public eServices issues are also examined from multi-disciplinary perspectives. Altogether articles authored by scholars with different academic backgrounds add up to less than 15% of the overall number of published works we surveyed. This relatively low percentage might reflect actual difficulties encountered by scholars in combining distant scientific approaches and methods (Bruce et al., 2004). However, one should mention, that scholars from departments of computer science/information systems are considerably

involved in interdisciplinary works, especially in collaboration with researchers in such disciplines as Health/life sciences and Law/Public Administration sciences.

Table 5: Distribution of articles by academic affiliation of authors and by service platforms (absolute and percentage values)

	Total	eGovernment	eEducation	eHealth	Infomobility	eProcurement
Economics/Management	7 (0.93%)	4 (0.95%)	0	0	0	3 (4.55%)
Computer Science/Information System	193 (25.70%)	193 (45.84%)	0	0	0	0
Law/Public Administration	258 (34.35%)	206 (48.93%)	0	0	0	52 (78.79%)
Statistics	0	0	0	0	0	0
Communication/Education Studies	34 (4.53%)	0	34 (75.56%)	0	0	0
Health/life Sciences	124 (16.51%)	0	0	124 (72.51%)	0	0
Environment/Geographical Studies	32 (4.26%)	0	0	0	32 (66.67%)	0
Economics/Management + Computer Science/Information System	6 (0.80%)	6 (1.43%)	0	0	0	0
Economics/Management + Law/Public Administration	5 (0.67%)	0	0	0	0	5 (7.58%)
Economics/Management + Environment/Geographical Studies	3 (0.40%)	0	0	0	3 (6.25%)	0
Computer Science/Information System + Law/Public Administration	18 (2.40%)	6 (1.43%)	0	0	6 (12.50%)	6 (9.09%)
Computer Science/Information System + Communication/Education Studies	4 (0.53%)	2 (0.48%)	2 (4.44%)	0	0	0
Computer Science/Information System + Health/life Sciences	45 (5.59%)	0	0	45 (26.32%)	0	0
Computer Science/Information System + Environment/Geographical Studies	6 (0.80%)	0	0	0	6 (12.50%)	0
Law/Public Administration + Communication/Education Studies	9 (1.20%)	0	9 (20.0%)	0	0	0
Law/Public Administration + Health/life Sciences	2 (0.27%)	0	0	2 (1.17%)	0	0
Law/Public Administration + Environment/Geographical Studies	1 (0.13%)	0	0	0	1 (2.08%)	0
Statistics + Communication/Education Studies	4 (0.53%)	4 (0.95%)	0	0	0	0
Total	751 (100%)	421 (100%)	45 (100%)	171 (100%)	48 (100%)	66 (100%)

As mentioned in section 2, many authors have highlighted a relative scarcity of works applying quantitative research methods to the analysis of public eServices. Figure 2 illustrates a significant increase in the number of articles using quantitative methods as the main analytical tools, which have become the largest share of published works appearing in top journals after year 2004. This trend seems to be consolidating over time, with the number of studies using mostly qualitative methods being stable since 2005, thus representing a lower and lower share of total publications. We also tried to separate studies which do not rely on sound evidence, no matter whether analyzed with quantitative or qualitative methods, which we dubbed as “illustrative/impressionistic”, and found that their presence in top journals has been clearly diminishing in the second half of the decade, possibly reflecting that applied research on public eServices is gradually reaching a greater maturity. Moreover, researches using quantitative methods produce the largest number of published works spanning all platforms of public eServices, except for infomobility where illustrative/impressionistic approaches prevail and quantitative approaches are not used. By contrast, quantitative methods are much more used in studies on eGovernment as compared to other platforms.



*The survey considers only the first half of 2010

Figure 2: Chronological trends in the use of different approaches: Number of articles by main methods used, 2000-2010 (total articles 751)

Table 6 illustrates the variety of statistical methods used in quantitative studies. Apart from descriptive statistics, the most commonly used are multivariate techniques, in particular correlations and factorial analyses. A lower albeit growing number of studies carry out conditional distribution analyses spanning from partial least-squares regressions to panel-data techniques, multiple regression analysis, linear regressions and binary logistic regressions. In terms of individual platforms, the latter set of methods seem to be more diffused in studies on eHealth, eGovernment and eProcurement. Univariate and multivariate statistics dominate in published works on eGovernment followed by eHealth and eEducation.

Table 6: Distribution of articles by data treatment-collect techniques and by service platforms (absolute and percentage values)

	Total	eGovernment	eEducation	eHealth	Infomobility	eProcurement
Univariate and multivariate statistics	375 (76.84%)	251 (80.97%)	34 (100%)	68 (62.96%)	0	22 (61.11%)
Conditional distribution analyses	113 (23.16%)	59 (19.03%)	0	40 (37.04%)	0	14 (38.89%)
Total*	488 (100%)	310 (100%)	34 (100%)	108 (100%)	0	36 (100%)
Web-search	236 (33.15%)	216 (52.43%)	3 (6.98%)	15 (8.77%)	0	2 (3.03%)
Telephone interviews	210 (29.49%)	100 (24.27%)	12 (27.91%)	70 (40.94%)	6 (30%)	22 (33.33%)
Face-to-face interviews	135 (18.96%)	30 (7.28%)	9 (20.93%)	52 (30.41%)	14 (70%)	30 (45.45%)
Questionnaire	83 (11.66%)	24 (5.83%)	17 (39.53%)	30 (17.54%)	0	12 (18.18%)
Web-search + Telephone interviews	35 (4.92%)	35 (8.50%)	0	0	0	0
Web-search + questionnaire	13 (1.83%)	7 (1.70%)	2 (4.65%)	4 (2.34%)	0	0

Total**	712 (100%)	412 (100%)	43 (100%)	171 (100%)	20 (100%)	66 (100%)
* Articles using only quantitative methods were considered; ** Articles using illustrative/impressionistic methods were not considered.						

Five main classes of indicators can be singled out in the eService literature (Grönlund and Andersson, 2006; Snijkers et al., 2007; Dwivedi, 2009): input indicators, output indicators, usage indicators, impact indicators and contextual indicators, let us discuss them in some details.

Input indicators measure the resources that countries have invested in public eServices (e.g. public IT spending per capita or as a percentage of GDP). Our research shows two results (Table 7): first, this type of indicators is not present in any platform if taken individually but only when considered jointly with the output indicators; second, service platforms that take over both indicators are those of eGovernment and eHealth, but with different absolute intensities (much higher for eGovernment).

Output indicators measure the on line availability and interactivity of public eServices delivered. Delivery is one of the most salient issues considered in studies on public eServices (21.04% of all recorded articles deal with this aspect), while only a few works analyze processes of service upgrading and the integration between back-office and front office services.

Most published works on eGovernment devote attention to front office services and particularly to the type of on line services currently being offered, the level of accessibility, usability and security of eServices. These studies suggest that a considerable heterogeneity exists across countries, regions and cities in the delivery of on-line public services. A few articles focus on back-office services, while slightly more than 10% of total publications in this field take into account both front office and back office solutions (technology and organizational aspects).

In the Infomobility platform articles, mainly based on descriptive statistics and case studies, focus on the delivery of intelligent transport services facilitating efficient and sustainable mobility such as the introduction of electronic travel guide devices, on-line scheduling, ticketing, reservation services and travel information systems. As far as back office services are concerned, three issues dominate: the existence of datasets on public transportation (e.g. integrating information on schedules, tariffs and ticketing), the degree of integration of infomobility services, the standardisation and interoperability of data-sources and integrated Bus operating systems.

Table 7 shows that a few studies have looked at the delivery and availability of eProcurement services. Researchers concentrated their attention mainly on one or more stages of the procurement process such as: Web-based information dissemination, eTendering, eMarketplace, eBidding and eReverse/Auctions. On the back office side we have identified several key themes such as: systems integration, security and authentication and process re-engineering. The diffusion of these elements is examined based on descriptive statistics or regression analysis.

Usage indicators provide a good monitoring tool for public sector to design eService diffusion strategies. Our results show that usage indicators are present in studies on eGovernment, eEducation, eProcurement and eHealth (Table 7). In the case of the first platform usage indicators are mainly focused on: the accessibility of eGovernment sites; the characteristics of citizens using ICTs to communicate with public administrations; demand side determinants of eGovernment diffusion; the utilisation and effectiveness of information posted on public web sites; barriers to eService development and potential effects of the digital divide on eGovernment adoption; demographic characteristics of population as a factor affecting the use of eServices and factors affecting their adoption.

In the other platforms (eEducation and eHealth) articles use less sophisticated analytical approaches, but in some cases they do refer to existing theories. In the case of eHealth platform, articles focus on factors affecting the adoption of specific services. It is observed that their adoption is not as rapid as expected, since positive returns depend on different factors ranging from implementation challenges to the evolution of legislative and procurement processes, and to the perceptions of the expected positive results among all involved stakeholders. More specifically, some articles focus on the adoption of Electronic Health Records. Some of the articles focusing on the role of users in the development of e-Health formalize probabilistic models of patients' survival.

Studies on eEducation have highlighted that progress in the use of ICT in education and training has been very uneven across and within countries especially in terms of e-maturity. Training in ICT usage has entered students' curricula in many countries, and has become a fundamental tool for teaching and learning across a wide range of subject areas. In other countries however, ICT adoption in education institutions is at an early stage: it has enhanced learning processes and favored the diffusion of eLearning practices (ICT enabled learning), but no great improvements in learning and teaching can be observed yet. Moreover, there are many studies describing how the use of ICT can favour the development new competencies and learning abilities. On the other hand, many studies have also identified barriers to ICT uptake in schools.

As far as eProcurement is concerned, the vast majority of the reviewed articles focus on single factors affecting the adoption of these services, e.g. the number of private suppliers participating in a public on-line bidding event. Only a few papers surveyed contained statistical tests of specific relationships between variables. Most studies in our sample did not rely on any discernable theory.

Impact indicators capture the actual satisfaction of end users, or more generally how public eServices affect their well-being. Impact indicators are present in about one fifth of all the reviewed articles (20.77%), slightly less than works using output indicators (21.04%) and much less than studies focusing on usage indicators (38.88%). Nevertheless this relative scarcity of publications addressing the impact of eServices largely reflects the fact that articles on eGovernment, which are the largest share of all reviewed works, rarely focus on these issues. By contrast, impact indicators represent an important fraction of published works in the other eService platforms, and particularly in the case of Infomobility, eHealth and eEducation.

With reference to the latter platform (eEducation), some articles examine the impact of ICT investment on learning and teaching. Although, it is difficult to establish a causal relationship between computers and educational outcomes, a few studies have attempted to do so, and there is some evidence that investment in ICT impacts on learner performance, on learning and on teaching. At the same time, some articles identify activities that enable teachers to save time and to increase their own productivity, especially in preparing and updating daily lessons and devising new methods of student evaluation.

As for eHealth, some articles have developed cost–benefit analyses based on case studies. Specific efforts were made to analyze the direct and investment costs associated with the development and implementation of web services, and to estimate the expected benefits in terms of quality, access and operational efficiency of health care. These studies also involved sensitivity analyses to benefits, costs and productivity effects associated to alternative utilization scenarios.

As regards Infomobility, studies on the impact of ICT on transportation services are mostly based on impressionistic evidence. The dominant view is that the diffusion of infomobility is associated with the breakdown of trade barriers, and with the development of new patterns of travel. Key aspects analyzed in these works are: (1) changes in mobility behavior; (2) the role of ICT in the structural transformation of cities and urban systems; and (3) the impact of intelligent transport systems in facilitating efficient and sustainable mobility.

Studies on eProcurement are mainly concerned with efficiency improvements associated with these services, due to lower transaction costs and shrinking idle times, to the higher speed of procurement processes, and improved management of information. Other reviewed articles focus on the benefits that could be generated by the eProcurement deployment such as: faster ordering, wider choice of vendors, greater control over procurement spending and better employee compliance, more accessible Internet alternatives for buyers, less paperwork and simplified administrative procedures, and re-engineered procurement workflows.

The context or environment indicators measure some of the preconditions for a successful implementation of public eServices. They mostly have to do with ICT infrastructure, ICT skills, and with institutional conditions, e.g. in terms of trust and legal environment. As observed in the case of input indicators, also **context indicators** are not present in any platform if taken individually but only when considered jointly with other indicators (output and usage indicators). From this perspective, one may observe that **output and context indicators** play a role in analyses of eGovernment and eEducation, but with different intensities.

Table 7: Key indicators used in the articles viewed by service platforms (absolute and percentage values)

	Total	eGovernment	eEducation	eHealth	Infomobility	eProcurement
Input indicator	0	0	0	0	0	0
Output indicator	158 (21.04%)	122 (28.98%)	0	0	18 (37.50%)	18 (27.27%)
Usage indicator	292 (38.88%)	181 (42.99%)	18 (40.00%)	65 (38.01%)	0	28 (42.42%)
Impact indicator	156 (20.77%)	12 (2.85%)	15 (33.33%)	79 (46.20%)	30 (62.50%)	20 (30.30%)
Context indicator	0	0	0	0	0	0
Input + Output indicators	37 (4.93%)	27 (6.41%)	0	10 (5.85%)	0	0
Output + Context indicators	50 (6.66%)	42 (9.98%)	8 (17.78%)	0	0	0
Usage + Context indicators	34 (4.53%)	21 (4.99%)	4 (8.89%)	9 (5.26%)	0	0
Usage + Impact indicators	24 (3.20%)	16 (3.80%)	0	8 (4.68%)	0	0
Total	751 (100%)	421 (100%)	45 (100%)	171 (100%)	48 (100%)	66 (100%)

A considerable attention is paid to front office issues (amount of on line service delivery), while back office analysis (improvement, re-engineering and Informatization of processes needed to deliver front office services) is neglected and left behind. One reason is the difficulty of measuring back office activities: many technical and organizational elements should be taken into account to capture this aspect of eService development. Moreover, measurement is complicated by the heterogeneity of back office requirements for any given level of front office service delivery. Our results confirm this trend (Table 8) except for eEducation and eHealth, where back office issues dominate, and Infomobility where analyses of front office services and of combinations of front and back office issues have an approximate equal share of articles. What is more worrisome is that, in the case of eGovernment which is the most investigated platform, the largest share of articles focus on front office issues, completely disregarding the complementarities with back office issues.

Table 8: Distribution of articles by main emphasis of analysis on back - office or front - office issues of public eServices (absolute and percentage values)

	Total	eGovernment	eEducation	eHealth	Infomobility	eProcurement
Front	408 (54.33%)	321 (76.25%)	9 (20.00%)	36 (21.05%)	0	42 (63.64%)
Back	241 (32.09%)	43 (10.21%)	27 (60.00%)	117 (68.42%)	30 (62.50%)	24 (36.36%)
Front and Back	102 (13.58%)	57 (13.54%)	9 (20.00%)	18 (10.53%)	18 (37.50%)	0
Total	751 (100%)	421 (100%)	45 (100%)	171 (100%)	48 (100%)	66 (100%)

6. Conclusions

This paper reviewed 751 refereed journal articles which we found to be dealing with public eServices, and examined them along several key dimensions, including time distribution of published works, affiliations of authors, themes investigated, geographic focus and research methods.

The results highlighted that, in the last decade, there has been a rapid growth in the volume of research output in this field. Although the interest raised by public eServices mirrors into the notable increase of articles published in leading journals with international impact, it remains that research in some domains is still at a very initial stage.

While a remarkable attention has been focused on eGovernment, virtually none of the reviewed articles analyze more than one of the following five domains: Infomobility, eEducation, eHealth, eProcurement and eGovernment.

Most researchers have their institutional affiliations either in Europe or in American countries. Moreover researchers in this field seldom publish in collaboration with colleagues from universities located in different geographical and disciplinary areas.

A large fraction of scholars carrying out research on public eServices are specialized in Law/Public Administration, Computer Science/Information System, although articles written by authors from areas such as Health/Life, Economics/Management and Communication/Education disciplines are also to be found.

The heterogeneity of academic backgrounds also translates into a diversity and richness of methodological approaches across researchers. Our results show that researches conducted are more quantitative than qualitative. In some circumstances, a combination of different statistical techniques is used to explore correlations and causal relations between key variables, spanning from multivariate techniques to regressions.

Some recommendations emerge from the analysis. Stronger links between researchers active in different geographical areas and countries would be desirable. More research should be devoted to comparing different public eService platforms, implying joint efforts in data collection and a knowledge accumulation.

References

- Atkins, S. E. (1988), Subject trends in library and information science research 1975- 1984, *Library Trends*, 36(4), pp. 633-658.
- Bailey, M.T. (1992), Do Physicists Use Case Studies? Thoughts on Public Administration Research, *Public Administration Review*, 52(1), pp. 47-55.
- Bloomfield, M. (1979), Quantitative Study of the publishing characteristics of Librarians, *Drexel Library Quarterly*, 15, pp. 25-47.
- Braadbaart, O., Yusnandarshah, B. (2008), Public Sector benchmarking: a survey of scientific articles, 1990-2005, *International Review of Administrative Sciences*, 74(3), pp. 421-433.
- Bruce, A., Lyall, C., Tait, J., Williams, R. (2004), Interdisciplinary integration in Europe: the case of the fifth framework programme, *Futures*, 36(4), pp. 457-470.
- Dwivedi, Y.K. (2009), An analysis of e-Government research published in *Transforming Government: People, Process and Policy (TGPPP)*, *Transforming Government: People, Process and Policy*, 1(3), pp. 7-15.
- Gordon, M. D. (1982), Citation Ranking versus Subjective Evaluation in the Determination of Journal Hierarchies in the Social Sciences, *Journal of the American Society for Information Science*, vol. 33(1), pp. 55-57.
- Grönlund, Å., (2010), Ten Years of E-Government: The End of History and New Beginning, *Lecture Notes in Computer Science*, vol. 6228, pp. 13-24.
- Grönlund, Å., Andersson, A. (2006), e-Gov Research Quality Improvements Since 2003: More Rigor, but Research (Perhaps) Redefined, *Lecture Notes in Computer Science*, vol. 4084, pp. 1-13.
- Hartley, J., Kostoff, D.N. (2003), How useful are "key words" in scientific journals?, *Journal of Information Science*, 29(5), pp. 433-438.
- Houston, D.J., Delevan, S.M. (1990), Public Administration Research: An Assessment of Journal Publications, *Public Administration Review*, 50(6), pp. 674-681.
- Löfstedt, U. (2005), E-Government – Assessment of current research and some proposals for future direction, *International Journal of Public Information Systems*, 1(1), pp. 39-52.
- Malone, T. W., Crowston, K. (1994), The Interdisciplinary Study of Coordination, *ACM Computing Surveys*, 26(1), pp. 87-119.
- Plümper, T., Radaelli, C.M. (2004), Publish or perish? Publications and citations of Italian political scientists in international political science journals, 1990-2002, *Journal of European Public Policy*, 11(6), pp. 1112-1127.
- Rice, T.W., McCormick, J.M., Bergmann, B.D. (2002), Graduate training, current affiliation and publishing books in political science, *Public Science and Politics*, 35(4), pp. 751-755.
- Scholl, H.J. (2009), Profiling the EG Research Community and Its Core, *Lecture Notes in Computer Science*, vol. 5693, pp. 1-12.
- Snijders, K., Rotthier, S., Janssen D. (2007), Critical Review of e-Government Benchmarking Studies. In Griffin, D., Trevorrow, P., Halpin, E. (Eds.) *Developments in e-Government. A critical Analysis*, IOS Press, Amsterdam.
- Stallings, R.A., Ferris, J.M. (1988), Public Administration Research: Work in PAR, 1940-1984, *Public Administration Review*, 48(1), pp. 580-585.
- Webster, J., Watson, R.T. (2002), Analyzing the past to prepare for the future: Writing a Literature Review, *MIS Quarterly*, vol. 26(2), pp. 13-23.

From Technology Diffusion to Social use: The Case of the eID Card in Spain

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Abstract: This paper describes Spanish governmental promotion of the national electronic identification card (eID) and its use by citizens since its inception in 2006. Here, we highlight the paradox regarding the high diffusion, but limited use, of the eID card in Spain, above all to complete electronic transactions with public sector agencies. This paper reviews a series of explanations about the possible causes of the abovementioned paradox. Theoretically, we focus on how the political science perspective, and especially new institutional theory, can help explain the development of digital identity policy and/or help address many of the questions raised in this paper. Methodologically, this work provides insights from a case study (on the Spanish eID card) using qualitative and quantitative data derived from various sources, and includes an analysis of official statistics about the use and diffusion of the eID in Spain. We conclude by offering an assessment on the Spanish government's initiatives to encourage the utilization of the eID card that allows it to be compared with other international cases.

Keywords: promotion, use, eID card, Spain, citizens

1. Introduction

In recent years public administrations have progressively employed information and communication technologies (ICTs) as a tool to facilitate and improve the management of their activities, the delivery of their services, and their relations with citizens and the private sector. Among other factors, these measures have been the consequence of processes of modernization of public administrations, the transposition of regulations from the European Union (in the European sphere) and the development of technological tools oriented in a specific way towards the improvement of electronic government (eGovernment), and the Information Society (IS). This paper centers on the study of one of these tools, the electronic identity card (eID), in Spain. The aim of this work is to analyze the level of diffusion in Spain of this key instrument for the consolidation of eGovernment, as well as the implications of the chosen model for the policy of Spanish digital identity, taking neoinstitutionalism and the governance as a theoretical reference point.

This paper therefore seeks to contribute to the study of the policies of digital identity at a comparative level, using the Spanish case. Various studies at international level have already analyzed the growing role of the policies of digital identity for the promotion of the IS in different contexts (Kubicek and Torsten, 2010; Lips et al., 2010; Kubicek, 2010). In particular, the general aim is to undertake an analysis of the public promotion of the eID and its social use from its inception in 2006 to date. In this way, we seek to demonstrate the paradox that exists between the success of the policy of digital identity in Spain, as regards the promotion and issuing of the eID, while at the same time highlighting the fact that it is little used by citizens. From a methodological point of view, this case study is grounded in the analysis of secondary data available on the eID in Spain, within an ongoing research project about the policy of digital identity of the Spanish government.

In this context, this work offers suggestions as to the possible causes that might explain this paradox, by employing the approach of neoinstitutionalism. This theoretical focus, especially in its cognitive/sociological version (March and Olsen, 1989; Peters, 2005), goes beyond personal and rational factors to consider the power of the institutions, their cultural aspects and their history, in order to explain the phenomenon of technological diffusion such as represents the case of the eID. From the historic perspective of neoinstitutionalism, one can argue that ideas and perceptions have a decisive role in the formation of public policies (Pierson, 2000). In this sense, in the comparative sphere, various studies about the evolution of the eID in different member states of the EU (Austria, Belgium, Denmark, Estonia, Finland, Germany and Sweden) display a high level of path dependency (Kubicek and Noack, 2010), with changes based upon their historic context (Backhouse, 2010). When developments in the eIDs begin, it is rare that it is from a completely new starting point, but rather that

they are the consequence of the incrementalism that is gradually constructed around the previous technological infrastructure, in their regulation and cultural norms. In this same vein, governance theory is also important to explain the Spanish digital identity policy. Here, the context of use and the actors involved not only affect the outcome of the process on innovation, but they ultimately shape its final design as well (Aibar 2001, Fountain, 2005). Thus, governance is linked to the so-called network policies. Under this approach, governance is perceived in a dynamic way, seeking to understand how public and private actors control economic activities and produce the desired outcome (Pierre y Peters, 2000: 23).

The paper is structured as follows. The next section briefly outlines the development and evolution of the policy of digital identity in Spain, detailing the most recent predecessors to the eID, its technical characteristics and key aspects of its diffusion. Following this assessment, quantitative data are provided about the level of diffusion and the uses of the eID in Spain. Next, a discussion of the data is presented, highlighting possible explanations for the existing paradox between the widespread availability of the eID in Spain, and its low level of social utilization. In conclusion the most significant findings of this paper are reviewed, and possible paths for future research on this question are highlighted.

2. General aspects of the digital identity policy in Spain and the eID

Any improvement to the eID requires an understanding of the origins of this technological device in the Spanish case and its evolution as an autonomous project within the Spanish policy of digital identity. The eID had its beginnings in 1998 under the Police Directorate, *Dirección General de la Policía* (DGP) (Ministry of the Interior) (Heichlinger and Gallego, 2010). This was the first step that continued in 2000, when the Ministry of Science and Technology asked for a full report on initiatives of eGovernment carried out by the DGP. This report made reference for the first time to the possibility of creating an electronic eID. In 2000, the eID was included in the Info Plan XXI and, therefore, entered officially onto the public agenda as a priority of the Spanish government due to the promotion of the IS (Arteaga, 2011; Criado, 2009; Heichlinger and Gallego, 2010; Mason, 2008). In fact, the Spanish government gave the eID the status of an emblematic project, as it is a transversal and essential action for the consolidation of various areas of the new digital society, and above all, eGovernment (Criado *et al.* 2003).

From 2004 onwards a second phase of the project began that was linked to the change in government that occurred after the elections in March that year. From this date forwards, despite the fact that the project continued to be under the responsibility of the DGP, Ministry of the Interior, the new First Vicepresident, María Teresa Fernández de la Vega, took the political lead and decisively promoted the eID (Heichlinger and Gallego, 2010). This meant that in January 2005, the DGP opened a tender for the provision of the technical teams of digital identification, and a short time afterwards the Ministry of the Interior and the Ministry of Industry, Tourism and Trade signed an agreement of financial and technical cooperation delineating the contribution of each ministry, with the purpose of financing the first stage in the implementation of the project.

The tender (with a total value of 11,982,000€) was awarded in July 2005 to a private consortium composed of telecommunications and information technologies companies (Indra, Telefónica and Software AG). Next the Royal Decree 1553/2005, of 23rd December, was approved, which regulated the issuing of the national identity document and its certificates of electronic signature, that governs the functioning of the eID in Spain. The social diffusion of the physical device began in March 2006, with a successful pilot project in Burgos, and six months later spread to other regions. Within very little time the device was available in one hundred per cent of provinces. (Arteaga, 2011).

More recently, the Spanish government has developed diverse initiatives and projects to promote the use of the eID. Within this field Arteaga and Criado (2011) have highlighted the importance of the Advance Plan '*Plan Avanza*' 2, with its program 'Public Digital Services', consisting of a financing line endowed with almost 186€ million (in 2009). Within the same program, special emphasis has been given to the support of local entities and to the development of the functionalities of the eID (ONTSI, 2010). Furthermore Advance Plan 2 has sought to boost the use of digital identity in the sphere of public administrations as a means of cooperation within the public sector and increase the degree of awareness, training and sensitization of the citizens, as well as businesses and other public administrations, in matters of ITC security. In complement, the 'Action plan of the Secretary of State for Telecommunications and for the Information Society' has aimed to promote the use of the eID

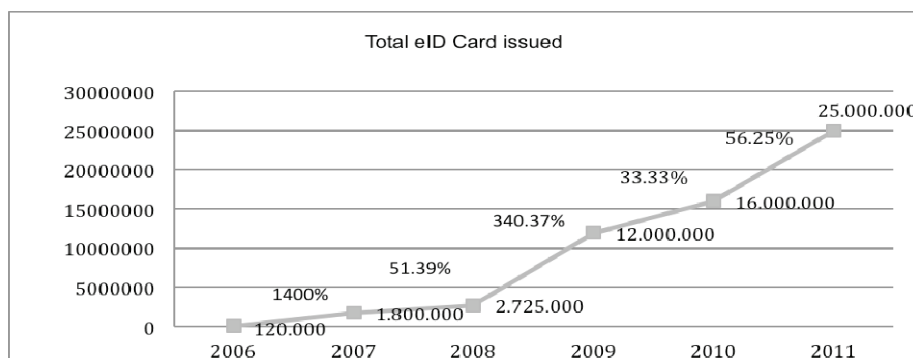
between citizens and business collectives. For that reason advertising campaigns have included training, dynamization and demonstration sessions, free distribution of 800,000 eID readers and four million information leaflets, as well as the creation of a specific webpage aimed at promoting awareness and use (www.usatudni.es) (INTECO, 2009). The governance theory may help to understand the social use of the eID Card in Spain, namely the sharing, exchanging and association between the government, the private sector, the society and the array of actors, who can contribute with their resources, competences, skills, products and experience, in order to achieve the expected outcome aimed to increase the social use of the eID Card in Spain.

3. Empirical analysis: The paradox between the eIDs issued and their effective use by citizens

This section offers data that permit us to compare the public promotion of the eID, with its effective use by citizens. In first place, the qualitative analysis is based on information obtained from secondary sources such as bibliography, press articles, research and publications about this theme that are available on the Internet. In second place, the quantitative study consists in the analysis of sources published by the Ministry of the Interior from 2006 (the period in which the pilot test of eID was initiated) until today. Data about the use of the eID is drawn from the National Institute of Statistics (*Instituto Nacional de Estadística*, INE), the Observatory of Security of Information (*Observatorio de la Seguridad de la Información*, INTECO), the National Observatory of Telecommunications and the Information Society (*Observatorio Nacional de las Telecomunicaciones y de la Sociedad de la Información*, ONTSI), The Observatory of the Quality of Public Services of the State Agency of Public Policies and the Quality of Services (*Observatorio de la Calidad de los Servicios Públicos de la Agencia Estatal de Evaluación de las Políticas Públicas y la Calidad de los Servicios* AEVAL), as well as the Fundación Telefónica. All these institutions make available data of interest that enable us to analyze questions in depth, such as the number and evolution of eID's issued, the level of use and the types of activities for those who use them, as well as the reasons for citizens not using the device.

3.1 eID's issued in Spain

The first question to raise relates to the number and evolution of eID's issued in Spain. In this sense, from 2006, until today, the Ministry of the Interior has published quarterly on its web portal (www.dnielectronico.es) the total number of eID's issued, in their press releases, (Arteaga and Criado, 2011). Figure 1 shows these figures displayed by year.



Source: Own elaboration from press releases found at portal: www.dnielectronico.es

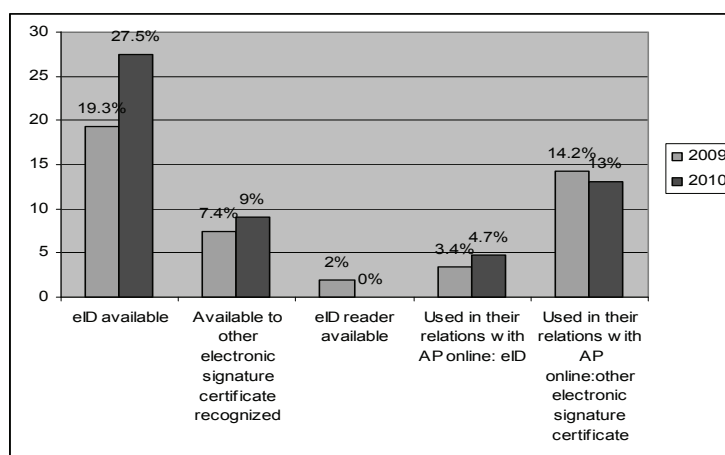
Figure 1: eID's issued annually by the National Police in Spain (and percentage of annual growth in %) 2006-2011

A glance at Figure 1 confirms the diffusion curve of this technological innovation in the Spanish case. One particular point to emphasize is the fact that more than 25 million of these devices of digital identity have been issued in six years, which represents more than four million eID's annually. However, the percentage increases over the previous years has not been homogenous, as can be seen in Figure 1. The Graph shows that the percentage increases in 2009 and 2011 in relation to the previous years are particularly notable, with more than nine million documents being issued in both cases. At the same time, if one takes into account the total Spanish population (that is over 46 million), this implies that the process of diffusion of the eID's can be found in the high part of the curve in the form an 's', in a way that one may forecast that in little time, diffusion will be near 100% of the population.

From a comparative perspective, this signifies that Spain is one of the most developed countries regarding the rate of diffusion of the eID in the international context. This conclusion has been clear since the publication of the United Nations E-Government Survey 2010, that places Spain in ninth position at world level regarding the development of eGovernment. Among other reasons, Spain has that position because of the opportunities available to citizens to realize full electronic transactions with public administrations. This position is above other countries that are more economically developed, such as France, Japan and Germany (Fundación Telefónica, 2011: 60). Therefore, in the light of the available data and the time that has passed since the launching of the project, one can describe the level of penetration of this technological innovation as a success story in Spanish society.

3.2 Analysis of the use of the eID in Spain

The second point to consider in this section refers to the social uses of the eID in Spain, an aspect that traditionally has not usually been considered when interpreting the policies of digital identity and, more specifically, evaluating the success of the spread of the eID within a country. In the Spanish case, the Survey about 'Equipment and Use of Information and Communication Technologies in Homes' of the INE, that has been undertaken since 2002, has included, in an innovative way since 2009, a series of questions about the eID that facilitates the analysis of its use by Spaniards. The survey contains the following questions: 55. Do you have an electronic eID?; 55.1 Have you used it in your relations with the public administrations through the Internet?; 56. Do you have some other certificate of electronic signature that is recognized?; and 56.1 Have you used it in your relations with the public administrations through the Internet? (INE, 2009, 2010). The results of the surveys undertaken in 2009 and 2010 are shown in Figure 2.



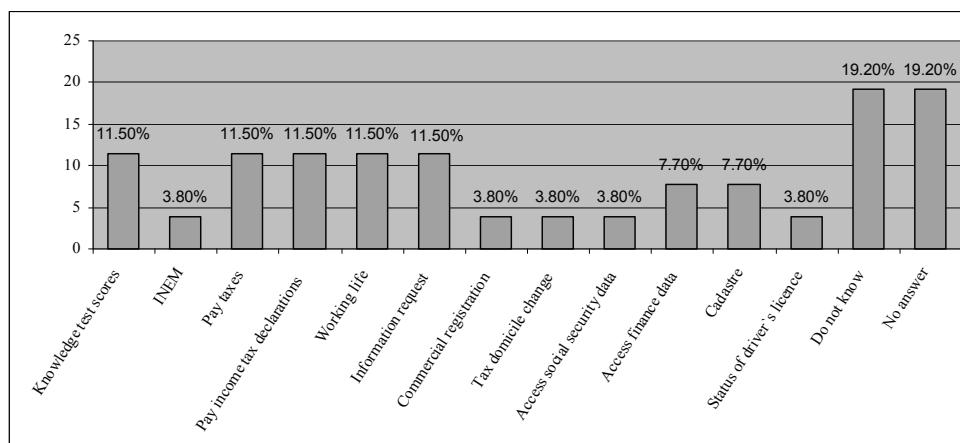
Source: INE 2009 and 2010.

Figure 2: Use of the eID and other certificates of recognized electronic signatures (2009-2010)

The data presented in Figure 2 are particularly illustrative of the use that Spaniards make of their eID, in general, and more specifically, in the relations with the public administrations. In the first case, the scarcity of the availability of eID readers means that its utilization by citizens is very limited. We have already highlighted above that the utilization of the Spanish eID requires a special reader that must be connected to the user's computer, something that it appears very few Spaniards do. In second place, it is clear that those individuals who make transactions with the public administrations through the Internet prefer, in general, another type of certificate of electronic transfer that is recognized and issued by other authorized entities (e.g. CAMERFIRMA, CERES, etc.), than their own eID. In any case, the rate of use of these different devices is falling when one considers the two observations undertaken in 2009 and 2010.

In second place, we have mentioned the need to know the degree of use of the eID in electronic relations with Spanish public administrations. In this regard, the barometer of the CIS (Nº 2794) of March 2009 characterized the principal uses realized by the Spaniards of the eID in their relations with the public administrations by electronic means, as can be seen in Figure 3. Here it is clear that the greatest use of the eID (11.5%) takes place in the payment of taxes; income tax; in applications for work; the request for information; and the obtainment of exam qualifications. This is followed by, access to data from the Tax Agency and Cadastre (7.7%). Finally, a lower percentage (3.8%) use it to

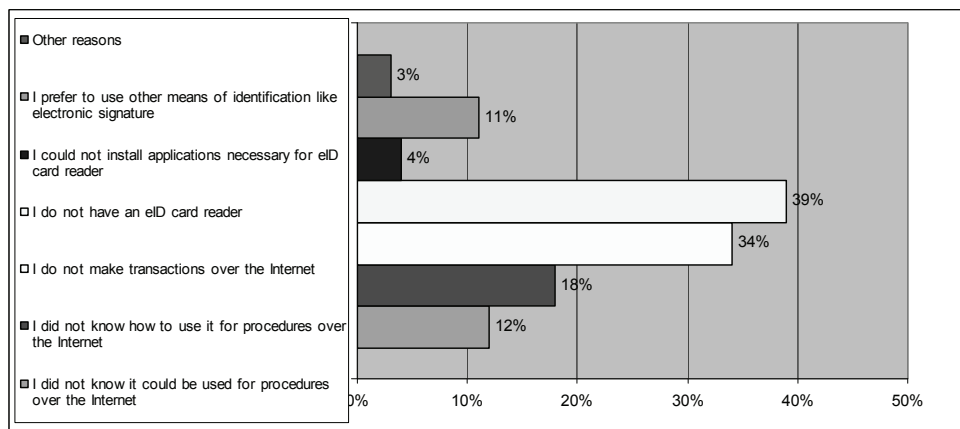
undertake tasks with National Employment Service, applications to the commercial register, changes of tax domicile, access to social security data, and to learn about their points situation on their driving licence.



Source: Advance on study results N° 2794. Barometer of the CIS (March, 2009).

Figure 3: Types of electronic transactions with the Public Administration using the eID card

Finally, data is presented relating to the reasons for Spaniards *not* using the eID. Some of these reasons are mentioned in the responses to the questions about citizen attitudes towards eGovernment, especially towards the eID, within the Third Report of June 2011 by the Observatory of the Quality of Public Services of the AEVAL (AEVAL, 2011). The data from this report makes it clear that although 70% of Spanish citizens report awareness of the eID, the percentage of people who use it to carry out, for example, banking tasks or their own electronic administration is still very low (see Figure 4). Similarly the report (AEVAL, 2011) emphasizes that the main reason for not utilizing the eID in tasks with the public administrations is because they do not have an eID reader (39%). The second reason is the non-realization of tasks through the Internet with public administrations (34%); and the remaining reasons are not knowing how to use it to undertake procedures by Internet (12%), the preference for other means of identification such as electronic signature (11%), and the problems in the installation of the applications necessary for its utilization (4%).



Source: AEVAL 2011 (from Estudio 2840 of 2010, AEVAL & CIS. Question: What is the reason for not having used your electronic eID in tasks with the Administration? Valid percentages)

Figure 4: Reason for non-use of the eID to undertake electronic transactions with the Administration

The CIS survey also impacts on other questions of interest. On the one hand, the data show a considerable number of citizens who are not aware of the existence of the eID and who do not have it (26%), as well as a percentage greater than 40% who know about it, but do not have it. The survey also reflects differences in the awareness of the eID among sociodemographic groups. Specifically, one can observe differences according to age, social class, and level of studies, but not by gender or size of municipality. Finally, among other aspects to bear in mind regarding the non-use of the eID, the 51% of citizens who know the device argue that they have not read, heard or seen any publicity

campaign that has been aimed at informing them about electronic tasks and procedures that they can undertake (AEVAL, 2011).

4. Discussion

This section offers a brief discussion of the data presented and seeks to go deeper into the paradox between the diffusion and the use of the eID in Spain, taking into account the approach of neoinstitutionalism. To begin, regarding the diffusion of the technological device, it has been shown that since 2006 the number of documents issued has grown significantly, until the figure has reached 25 million. The pattern of growth that this technological innovation has experienced has been in the form of an 's' in a way that makes it forecastable to say that within a short time the moment of saturation in which the intensity of the diffusion will reduce in a notable form until it will stabilize at around 100% of the Spanish population. In sum, from this initial perspective, one can conclude that the diffusion of the eID has been a success in the policy of digital identity in Spain.

The speed of the diffusion of the eID in Spain can be put down to various factors. In first place, it is necessary to emphasize that the procedure of application and the issuing of the device to citizens was practically free. In second place, another decisive aspect is the existence from the year 1944 of an obligatory national identity card, that was widely accepted by citizens as an instrument of personal identification. In contrast to other countries, Spain has never had a social debate about the implications for privacy and the security of the existence of the eID. In third place, one can also highlight the rapid transposition of European Union rules on this issue. This quick application has facilitated the provision of European funds, and has thereby alleviated the heavy investment of economic resources, material and human, by the Spanish government. Finally, the effort of the central government in the promotion and issuing of the eID has also been of key importance to help position the country at the vanguard of applications and services of eGovernment and the IS.

Together with this, one must also note the low level of use of the eID among citizens, that has not corresponded with the success of diffusion of the device. This paradox may be driven by distinct reasons of a social, technical and procedural type that act as inhibitors to the generalized use of this new identification tool (Arteaga and Criado, 2011). This point will be developed at a deeper level in future works, but here we can already point to some ideas derived from the analysis undertaken.

In first place, from the social point of view, the generalized acceptance of the eID as an identification device, contrasts with the low level of training and knowledge of citizens about the advantages of use of the new technologies and the presence of the digital divide; although this gap is increasingly declining. In second place, from a technical standpoint, the use of the eID is complex for citizens, who require a basic knowledge of computers. In third place, from a procedural point of view, the process to use the eID is not simple. In general, citizens have to undertake various attempts before achieving effective use, given that there are problems with the electronic certificates of the digital administrations sites and that constant security alerts appear that, with frequency, make the process difficult (Isigma, 2010).

This lack of adjustment between the availability of the eID device and its utilization by citizens can be analyzed from the theoretical perspective of neoinstitutionalism. Although it will be left for future studies to develop this perspective in more detail, one can state that the absence of fit, that at times is produced between the formal institutions and the functioning of public policies, is one of the key spheres of interest for neoinstitutionalism, and also governance theory may help to a better understanding. The gap between the aims of public policy and the results achieved may be due to, for example, conflict with the predominant values in society (although it may be at an informal level) or tension being produced between different reference contexts (for example, a lack of fit between institutional frameworks and institutional guidelines) (Meyer and Rowan, 1977: 357 and ss.). In other words, the policy of digital identity in Spain seems to have been led by the rapid diffusion of eID devices, although this has fitted badly with a society that has been unprepared for its use.

5. Conclusions

This paper has undertaken an analysis of the policy of electronic identity in Spain, taking as an object of analysis the Spanish eID. The theoretical starting point has been the approach of neoinstitutionalism and its relation with the diffusion of technological innovations of the public administrations. In this way this work has gone deeper into the development and evolution of the policy of digital identity in Spain, detailing the most recent predecessors to the eID, its technical

characteristics and key aspects of its diffusion. The landmarks in that process have been clearly outlined, particularly the key moment of the issuing of the first electronic identity cards in 2006. In any case, the ideas that can be found behind the policy of the eID in Spain were already consolidated years before. Statistical data on the diffusion and use of the eID in Spain has also been presented. The conclusion here is that the broad 'lack of fit' between the rapid and widespread provision of this device and its rare and limited level of social use, means reconsidering the conclusion of success of the policy of digital identification, as an exclusive result of the number of documents issued. In the discussion some of the causes of the success of the diffusion of the eID in Spain have been made clear, as well as the inhibitors of its social use. This paper has then linked the study of these processes with the policies of digital identity with the neoinstitutionalist and governance theory.

This paper has not exhausted the study of the policies of digital identity in Spain, nor its potential for comparison with other cases at international level. Firstly, the successful implantation of the eID in Spain continues being uncertain and there is a long road ahead to travel. Therefore, one of the challenges in the future for both administrators and politicians, will consist in: raising awareness and offering citizens all existing services in an electronic format, diffusing its advantages, and improving confidence in eGovernment. Similarly the existence of a single digital identity document has become a prerequisite for interoperability within public administrations in the European sphere. In this framework, the European consortium STORK has already begun a development initiative (Secure Identity Across Borders Linked). The consortium is made up of 13 member countries (plus Iceland) that are working together so that the eID nationals can be used across the whole of the European Union. This project has emphasized the study of the policies of digital identity from an empirical point of view. This is generating the need for studies at a comparative level of the eID in various countries, and the Spanish case is part of that process. This paper hopes to have contributed to promote that exchange, bearing in mind the importance of factors that go beyond the legal and technological aspects in the process of the deployment of policies of digital identity, in general, and the implementation of the eID, in particular.

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References

- AEVAL (2011) 3th Report: The Public Administration in the opinion of citizens: Satisfaction with services, spending assessment, reliance on public employees and attitudes towards e-government. June 2011. Observatory of the Quality of Public Services. Ministry of Territorial Policy and Public Administration.
- Arteaga, Sor (2011) "Approach to the digital identity politics in Spain: analysis of the eID Card use by citizens". Number 11A2. II International Congress on Government Administration and Public Policy. Madrid, Spain GIGAPP. Available at: <http://www.gigapp.org/es/acceso-ponencias> Consultation date: 7/11/2011
- Arteaga, Sor y CRIADO, J. Ignacio (2011) "Public Promotion and Social Use of the Spanish eID Card". ICEGOV2011, September 26–28, 2011, Tallinn, Estonia. ACM 9781450307468 p.385-386
- Backhouse, James (2010). Identity in the Information Society. Vol.3, number 1, 1-3. Doi: 10.1007/s12394-010-0065-8.
- CIS (2009). Centre of Sociological Research. Advance on study results N° 2794, Barometer March, 2009. Available at http://datos.cis.es/pdf/Es2794mar_A.pdf Consultation date: 27/04/2011
- Criado J. Ignacio (2009). *Between utopian dreams and visions pessimistic: the Internet and Information Technologies and Communication in the Modernization of Public Administrations*. Madrid: National Institute of Public Administration (INAP).
- Criado, J. Ignacio. (2010). "The Politics of eGovernment in Spain: between recent innovations and old inertias". Comparative E-government: An Examination of E-Government Across Countries, ed. Ch. Reddick. Nueva York: Springer, 1st Edition, pp. 275-295.
- FUNDACIÓN TELEFÓNICA (2011). *The Information Society in Spain 2010*. Editorial Ariel. Available at: http://e-libros.fundacion.telefonica.com/sie10/aplicacion_sie.html Consultation date: 01/11/2011
- Heichlinger, A. & Gallego, P. (2010). "A new e-ID card and online authentication in Spain". In Special Issue: *The Diversity of National e-IDs in Europe: Lessons From Comparative Research* Edited by H. Kubicek Guest. Springer. Available at: <http://www.springerlink.com/index/317530p411w00453.pdf>
- ISIGMA (2010). How overcome barriers for the eID card use? Data of publication: 22/06/2010. Available at <http://blog.isigma.es/2010/06/22/la-carrera-de-los-110-metros-dni-electronico/> Consultation date: 11/02/2011
- INE (2010). *Survey on Equipment and Use of Information and Communication Technologies in Households 2010* (ICT-H'10). Available at <http://www.ine.es>. Consultation date: 11/02/2011

- INTECO (2009) Report of the 10 th wave of the *Study on Information Security and e-Trust in Spanish households*. INTECO.
- INTECO (2010) Report of the 14 th wave of the *Study on Information Security and e-Trust in Spanish households*. INTECO.
- Kubicek, Herbert (2010) "Introduction: conceptual framework for research design to analysis of national eID card management comparativy system in selected European countries. Identity in the Information Society", Special Issue, 2010. Doi: 10.1007/s12394-010-0052-0.
- Kubicek, Herbert & Torsten, Noack (2010). "Different Countries, Different paths extended comparison of the introduction of eID cards in eight European Countries". 2010. Doi: 10.1007/s12394-010-0063-x.
- Lips, M., Taylor, J. & Organ, J. (2010). "Identity management in e-Government service provision". In Nixon, P; Koutrakou, V. and Rawal, R. *Undertanding E-Government in Europe*. Routledge. 2010.
- March, J. G., & Olsen, J. P. (1989). *Rediscovering Institutions: the Organizational Basis of Politics*. New York: Free Press.
- Mason, S. (2007). *Electronic Signatures in Law*. 2 ed. Haywards Heath: Tottel.
- Meyer, John W., y Brian Rowan. (1977). "Institutionalized Organizations: Formal Structure as Mith and Ceremony". *American Journal of Sociology* 83 (2):340-363.
- ONTSI (2010). *La Sociedad en red 2009. Informe anual*. Edición 2010. ONTSI.
- Peters, B. G. (2005). *The New Institutionalism. Institutional Theory in Political Science*. 2.ed. London: Continuum.
- Pierson, P. (2000). The Limits of Design: Explaining Institutional Origins and Change. *Governance: An International Journal of Policy and Administration* 13 (4), 475-499.

Data Mining Solutions for Local Municipalities

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Abstract: This study proposes data mining solutions for local municipalities to make their decision support mechanism easier. The purpose of this study is to get intelligent solutions related to local government services from past data and to estimate the future activities. It covers socio-cultural analyses, income/expense analyses, infrastructure analyses, fraud detection analyses, simplification, verification and similarity analyses. Proposed system is based on service oriented architecture. The purposes of this project are; to give information about current state, to facilitate decision making for future activities, to increase income and decrease expense, to supply easy and correct data input to the system and to supply easier document tracking system. Seventeen scenarios were created initially. These scenarios are; Staff Analyzing, Classifying Citizens According to Real Estate Tax, Distribution of Citizens delaying Real Estate Tax, Income Operations Analyzing, Fuel Oil Analyzing, Electricity Consumption Analyzing, Cash Desk Analyzing, Distribution of Corporate Foundation, Moveable Material Analyzing, Logs Analyzing, Water Notice Analyzing, User Accounts Analyzing, Accountancy Analyzing, Employee Analyzing, Estimation of Wages, Citizen Analyzing and Corporate Foundation Analyzing. Service Oriented Architecture (SOA) is used as software architecture. Five services - Association Rule Mining Web Service (ARMWS), Outlier Detection Analysis Web Service (ODAWS), Classification Web Service (CWS), Clustering Web Service (ClustWS) and Data Preparation Web Service (DPWS) - were created. 7 scenarios used ARMWS, 3 scenarios used ODAWS, 2 scenarios used CWS and ClustWS is used by 5 scenarios.

Keywords: data mining, applications of local government, structure and urban informatics, service oriented architecture, knowledge management

1. Introduction

Data mining is the process of extracting hidden patterns from large datasets in human understandable structure. Data mining has ability to tell important things that you didn't know or what is going to happen next. The main data mining methods are classification, clustering, outlier detection analysis and association rule learning.

Current municipal management information systems support just execution of operational processes and creation of standard reports. New method and techniques that include data mining should be used to utilize retrospective knowledge, to develop solutions which are close to human intelligence and to make prediction for the future.

Data mining solutions for local municipalities provide that local municipalities can discover hidden patterns, relationships, changes, irregularities, and rules from large datasets. Local municipalities can perform their decision making process more rational, more accurate and faster. Local government personnel can discover knowledge without having any theoretic information about data mining, by using developed business intelligence software.

The need to business intelligence increases. The more increase in data in Local Municipalities, the more need to the data mining. Increase in the prevalence of use of municipal management information systems and formation of huge data heaps that ordinary analyses are inadequate for, increases business intelligence need at municipal sector.

It simplifies the way to give information to the local government about current status and to make decision for the future. The usage of new technologies at municipal sector will become widespread. Additionally, it contributes to the national economy with income/expense, wastage and abuse analyses at local municipalities.

This study proposes to get intelligent solutions related to local government services from past data and to estimate the future activities with OMIS-DM (OLGU Management Information System-Data Mining). The aim of this study is to facilitate decision making for future activities and to give information about current situation of the local municipalities.

2. Related works

In recent years, some studies that data mining has been applied for municipalities have been done. Poles and Margonari (2009) developed a data mining tool which is called modeFrontier for Italian municipalities. Syväjärvi et. al. (2009) had aimed to the direction of data mining and information and communication technology (ICT). Ahmadvand et. al. (2010) applied a data mining framework on the database of Tehran municipality. Andrienko et. Al. (1999) proposed to combine applications of techniques of knowledge discovery in databases (KDD) with various methods of interactive classification of spatial objects supported by map displays. Seth and Thill's (2008) analysis of New York City calls into question some assumptions about the functional form of spatial relationships that underlie many modelling and statistical techniques. Solomon et. al. (2006) demonstrated how the use of data mining analysis can be used to evaluate how well cameras that monitor red-light-signal controlled intersections improve traffic safety by reducing fatalities. Minseok and Wil (2008) presented new process mining techniques but also use existing techniques in an innovative manner. Their approach had been implemented in the context of the ProM framework and has been applied in various case studies. They demonstrated the applicability of their techniques by analyzing the logs of a municipality in the Netherlands. Guoqing et. al. (2009) presented a research effort undertaken to explore the applicability of data mining and knowledge discovery (DMKD) in combination with Geographic Information System (GIS) technology to pavement management to better decide maintenance strategies, set rehabilitation priorities, and make investment decisions.

3. Service Oriented Architecture (SOA)

The base of SOA is partitioning the application layer into services and using them on servers. In this study five services are created to supply SOA based data mining solutions for local municipalities. The main reasons that make us choose SOA are; reusability, interoperability, scalability, flexibility and low cost. Web services are created generically. That means all services can work with all kind of dataset.

Data Preparation Web Service (DPWS): This web service is created to prepare data that comes from OMIS for data mining algorithms. Includes 4 child processes. These are; Data Integration, Data Reduction, Data Preprocessing and Data Transformation.

Association Rule Mining Web Service (ARMWS): This service is used to discover hidden relationships from large datasets. FP-Growth (Han et al., 2000) algorithm is used in this service.

Outlier Detection Analysis Web Service (ODAWS): Outliers are detected via this service. Local Outlier Factor (LOF) (Breunig et al., 2000) algorithm is used.

Classification Web Service (CWS): Classification operations are performed through this web service. Bayes (Thomas Bayes, 18th Century) and C4.5 (Quinlan, 1993) algorithms are used.

Clustering Web Service (ClustWS): This web service is used for clustering. KMeans++ (Arthur and Vassilvitskii, 2007) algorithm is used.

4. System architecture

Data mining solutions for Local Municipalities works integrated with OLGU Management Information System (OMIS (OYBS-MIS)), and it is called OMIS-DM(OYBS-DM) as shown in Figure 1.

- Data from OMIS are sent to the Data Preparation Web Service
- After data preparation operation, data that is ready for data mining, is collected in the Data Warehouse
- This data is used in data mining web services according to scenarios.
- Results of data mining are saved in database server.

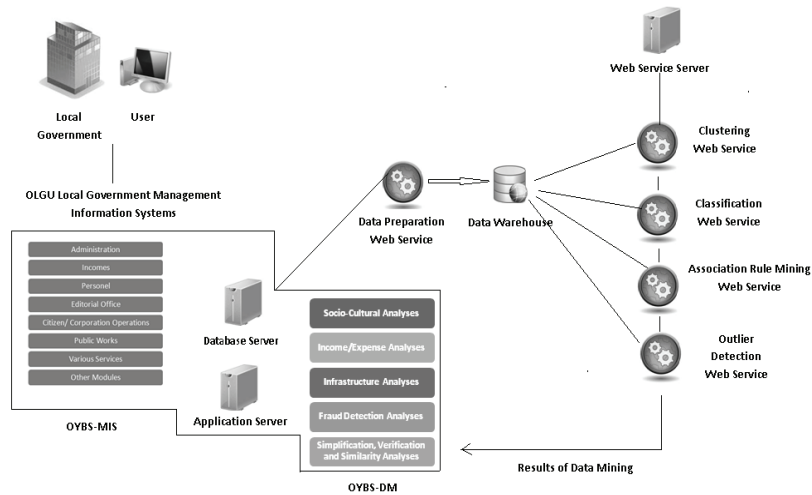


Figure 1: Deployment diagram

5. Scenarios

5.1 Socio-cultural analyses

These kinds of analyses are created to analyze citizens, corporate foundations like bank, company, cooperative and municipal employee.

Employee Analyzing

The purpose of this scenario is to cluster local government employees according to number of their children, age, duration of working, the number of days that employee didn't work and education status.

This scenario is important to make common decisions about municipal employees. For example municipal or department manager may want to warn employees who have big number of non working days by sending mails to this cluster or manager may want to make advance payments to employees whose duration of working bigger then 10 years and number of children bigger than 3 but have small non working days. In this situation manager is able to find this cluster easily. Also correlation between employee's attributes can be found via this scenario.

Clustering service is used for this scenario.

Citizen Analyzing

Citizens can be profiled according to their demographic properties, so local management decisions can be made suitable to these profiles.

These profiles can be useful for election campaigns, promotions and charity events. For example according to our sample analyses 56,8% of Karşıyaka (county of Izmir, Turkey) citizens are married, ages are between 65 – 80 and female. In this situation we can see that promotions which focussed on youths should not be done in this area. Or this area is not suitable for education charity events. If the mayor wants to perform election campaign then mayor should create strategies for majority to make satisfy citizens. For example new hiking trails may be more suitable than new tennis courts for these citizens.

This scenario uses Association Rule Mining service.

Staff Analyzing

Local government staff can be profiled according to their demographic properties, so local management decisions can be made suitable to these profiles. Association Rule Mining service is used for this scenario.

Corporate Foundation Analyzing

The aim of this scenario is to cluster corporate foundations according to their annual payments. This scenario can be useful to find corporate foundations which pay duties regularly. For example if municipal wants to serve some kind of services to the foundations then municipal may choose foundations which pay duties regularly, to reward them. Or corporate foundation cluster which do not pay duties regularly can be find easily by using this scenario and they can be warned. This scenario uses Clustering service.

5.2 Income/expense analyses

These analyses include payment of duty like real estate, environmental and expense of moveable material logs analyses.

Moveable Material Analyzing

The aim of this scenario is to find material-year-supplier-amount relations. This scenario may be used to facilitate moveable material input process. For example according to analyze, if 53% of logs 150.01.04.01 and 150.01.01.03 moveable codes are used together then, if user enters 150.01.04.01 code then 150.01.01.03 code will be showed on the screen automatically. This scenario will facilitate and accelerate input operations.

Association Rule Mining service is used by this scenario.

Estimation of Wages

User can estimate wages of employees by analyzing previous employee records through this scenario. To make prediction, age of employees, duration of working as years, education level, job and wage are used. This scenario is useful to provide fairness. Because there will be concrete assessment criteria to determine wages.

Classification service is used for this scenario.

Classifying Citizens According to Real Estate Tax

The main aim of this scenario is to classify citizens according to their real estate tax payments and so tax payments of next term or year can be estimated. According to this estimation some precautions can be supplied.

This scenario uses classification service.

Distribution of Citizens Delaying Real Estate Tax

The purpose of this scenario is to find distribution of the citizens who delay the real estate tax payment, on the map. Sample analyze result is shown in Figure 2. According to this figure it can be seen that green pin symbolizes citizens who pay the highest taxes. If we scan the map in Figure 2, then we can see that green pin is at Mavişehir District.

This scenario uses Clustering service.

Income Operations Analyzing

The main aim of this scenario is to explore which types (MS, BİL, A, D, ...) of which income operations (real estate, water, environmental cleaning etc.) are done frequently by which users on which months. This scenario is useful to prevent wrong operations. For example according to analyze 27% of rules are User Name="Ali Yılmaz" and Income Type Code = "Real Estate Tax". If this user does any

operation which Income Type Code="Sanitation Tax" then system will warn him about operation. This prevents possible wrong operations.

This scenario uses Association Rule Mining service.

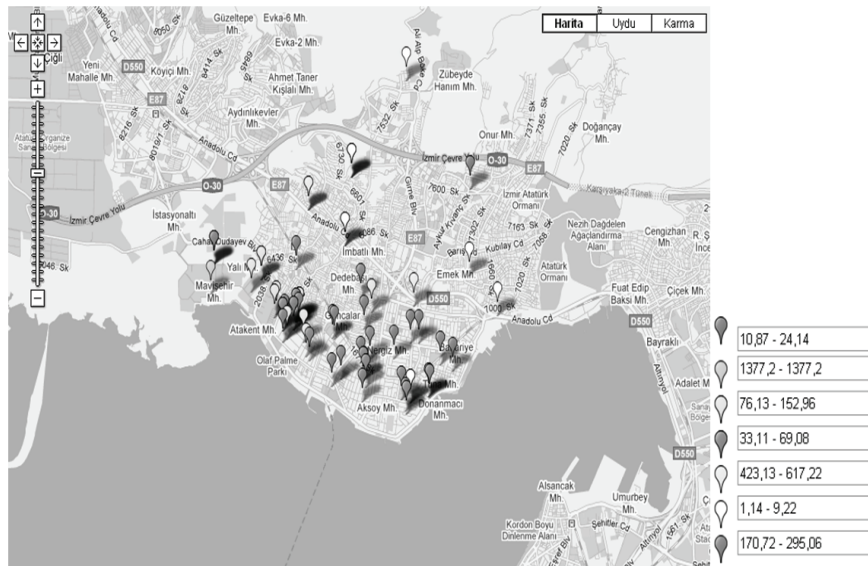


Figure 2: Distribution of citizens

5.3 Infrastructure analyses

These kinds of analyses are created to analyze water and electricity consumptions and distribution of corporate foundation according to their depts.

Water Notice Analyzing

This scenario's purpose is to cluster citizens according to their water consumption. This scenario can be useful when municipal authority wants to warn citizens who consume water higher than limit.

This scenario uses Clustering service.

Electricity Consumption Analyzing

Aim of this scenario is to detect outliers by analyzing electrical consumptions. Example analyze result is shown at Table 1. As it can be seen from the table, the highest consumption was done in August in 2007. Also, the least consumption was done in May in 2009. Reasons of these situations can be searched according to analysis result.

Table 1: Electricity consumption analyzing

Month	Year	Total
5	2009	35,94414
1	2009	1981,184
12	2009	3620,022
8	2007	4075,097

This scenario uses Outlier Detection service.

Distribution of Corporate Foundation

The purpose of this scenario is to view corporate on the map by clustering them according to their depts. This scenario is similar to “Distribution of Citizens Delaying Real Estate Tax” scenario.

This scenario uses Clustering service.

5.4 Fraud detection analyses

Cancellation operations at cash desks, personnel performances and fuel oil analyses belong to this kind of analyzing.

Logs Analyzing

The main aim of this scenario is to determine who performs which transactions on which computer, on which days on which tables. This scenario can be useful for table update or transportation operations. For example if the minimum support value of “Table Name=“Income”, Time=“08.00-12.00” and Day=“Wednesday”” rule is 46% then we can realize that on Wednesday at 08.00-12.00 critical operations should not be applied on “Income” table, this can cause a big problem. Because generally personnel work on this table on Wednesday between 08.00 and 12.00.

Possible abnormalities can be caught by using pre-created general user profile information.

This scenario uses Association Rule Mining service.

Fuel Oil Analyzing

Outliers can be detected by analyzing fuel oil consumptions through this scenario. Benefit of this scenario is similar to “Electricity Consumption Analyzing” scenario. Table 2 shows sample Fuel Oil Analyzing result.

Table 2: Fuel oil analyzing

Month	Year	Total (TL)
9	2008	87976,56
7	2009	95000,128
12	2009	98520,022

This scenario uses Outlier Detection service.

Cash Desk Analyzing

The goal of this scenario is to analyze cash desk operations that are performed by cashier and to detect outliers. Table 3 shows sample result of analysis. As shown below, the collector whose ID is 13 deletes records that belong to Ahmet Kaleli 73 times. This is not normal. This situation should be asked collector.

Table 3: Cash desk analyzing

Collector ID	Number of Deletion	Name	Surname
13	73	AHMET	KALELİ

This scenario uses Outlier Detection service.

5.5 Simplification, verification and similarity analyses

These analyses include User Account and Accountancy Analyses.

User Account Analyzing

The purpose of this scenario is to profile user accounts. According to this scenario answer of which user generally when studies question can be found. For example “User Name=“Ali Yıldırım” Start Time=“08.00-12.00” Session Duration=“4 Hours”” rule is found with 57% minimum support. In this situation for example we can conclude that extra works should not be demanded from “Ali Yıldırım” between 08.00 and 12.00. Because he works dense at these hours.

This scenario uses Association Rule Mining service.

Accountancy Analyzing

The main aim of this scenario is to detect which accounts are entered together. So, accounts will be viewed on the screen automatically. This provides easy information entrance.

This scenario uses Association Rule Mining service.

6. Application

OMIS-DM was developed by using Visual Studio .Net 2010 platform. Silverlight technology is used for interfaces.

Local government personnel can use OMIS-DM without having any theoretic information about data mining via user friendly interfaces. User can do analyzes just by pressing a button. User can save analysis results or print results as a report.

User can add new scenarios by using “new scenarios” screen by defining queries, data preparation operations and data mining technique.

All data preparation operations are done in the background automatically. For example if a scenario uses clustering web service then normalization operation is done without showing on the screen.

Classification Module

General view of classification screens are shown in Figure 3. Results are shown in grid view and tree view. User can do estimation operation at the bottom of the screen.

Classification screens are divided into 3 parts. First part includes grid view. All details of results are shown at this part. If-then rules that are acquired from decision tree are listed with proportion details in grid view. Second part is allocated to show decision tree by using tree view. For example; according to example that is shown in Figure 3, if age>80 then probability of timely real estate tax payment is ≤ 20 . User can see this result by looking at the tree view.

Third part is created to make prediction. User enters values of necessary attributes, and then makes prediction by pressing only one button. If user wants to classify more than one record, then user loads related file by using other button.

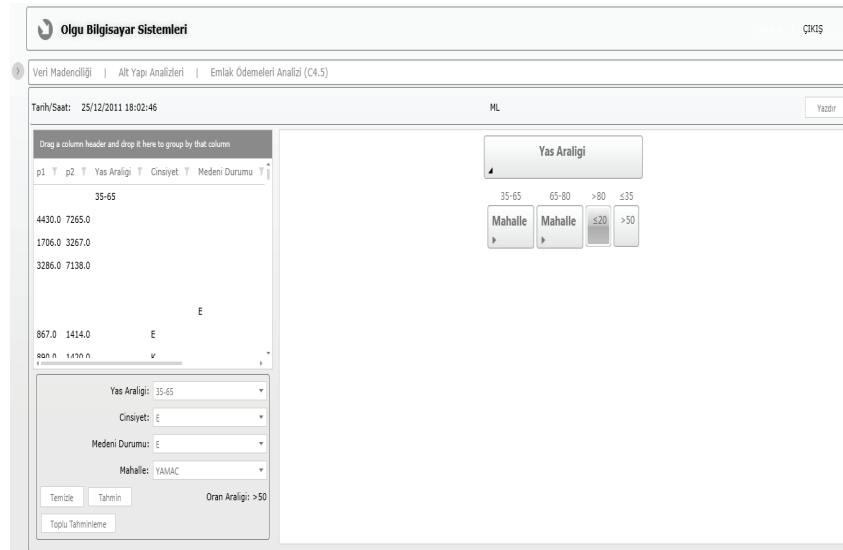


Figure 3: Classification screen

Clustering Module

Clustering results are shown on the map. Each colour symbolizes different clusters. Firstly, records are clustered, and then, they are shown on the map according to their addresses as shown in Figure 4.

User can make comment about citizens just by looking at the map. In the example shown in Figure 4, citizens are clustered according to their real estate payments by using “Distribution of Citizens Delaying Real Estate Tax” scenario. For example while purple and pink pins are intensive at the coastline, blue pins are intensive at upcountry. So, reasons of that situation can be searched and suitable solutions can be found.

Detailed results are shown in grid view as well.

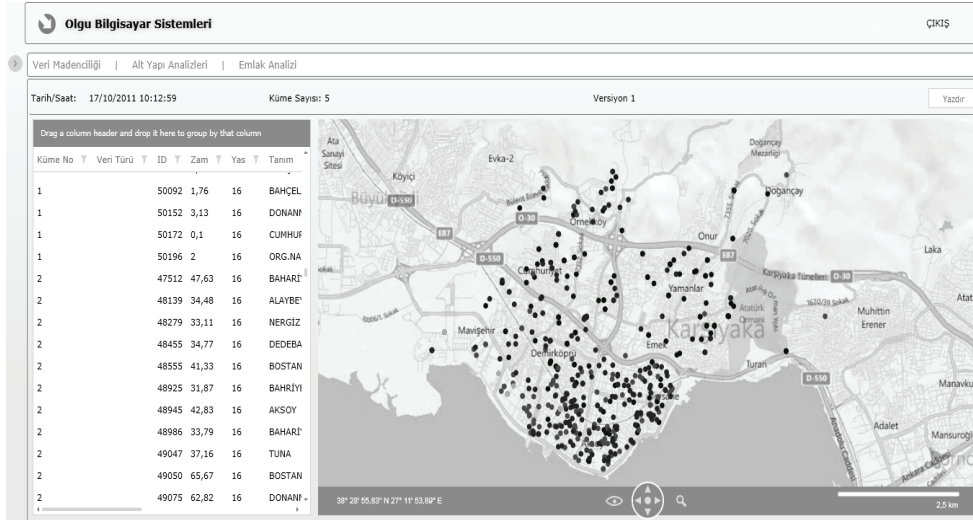


Figure 4: Clustering screen

Outlier Detection Module

Results of scenarios that use Outlier Detection service are shown on the screen like in Figure 5. In this example Electricity Consumption Analyzing scenario results are shown in Figure 5. Outlier value of outliers is “1”, while others are “0”. Results are shown with month and year details. As shown in Figure 5, there are outliers in electricity consumption on October 2009, and on December 2007 for related local government. While there is so much electricity consumption on October 2009, this consumption is so small on December 2007.

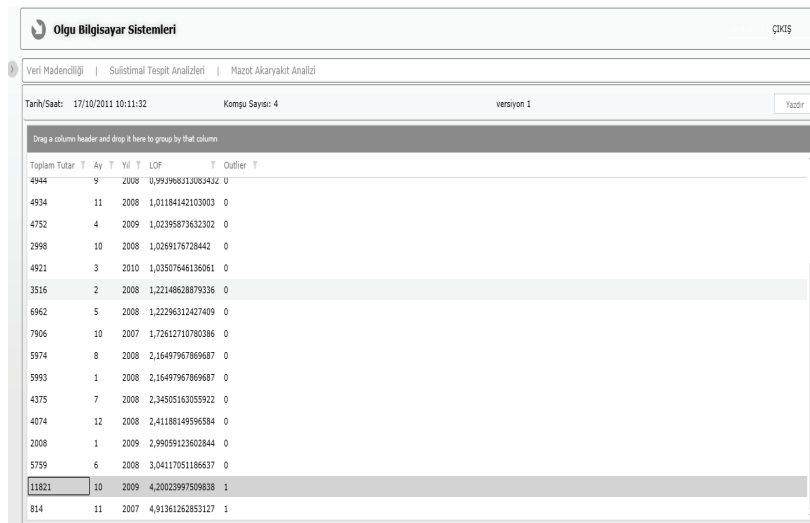


Figure 5: Outlier detection screen

Association Rule Mining Module

The results of scenarios that use Association Rule Mining service are shown with a grid view and a bar chart as in Figure 6.

Association Rule Mining screens are divided into 2 parts. First part includes grid view. Relations are shown with support and number values. There is a bar chart in the second part of the screen. This chart shows relations between items. In the example that is shown in Figure 6, “600A” account code was selected at the top of the graphic. And then account codes that work with 600A are shown at the chart with ratio values.

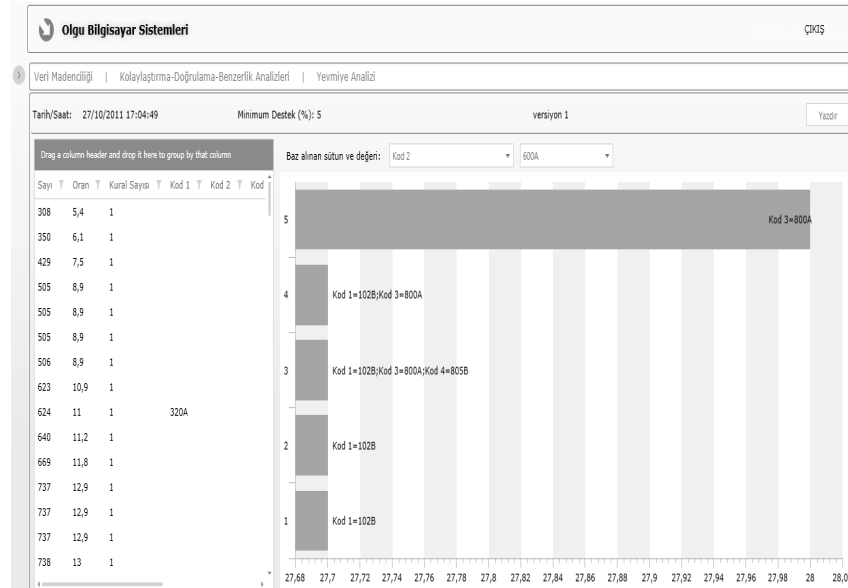


Figure 6: Association rule mining screen

7. Conclusion

Data mining solutions for local municipalities provide that local municipalities can discover hidden patterns, relationships, changes, irregularities, and rules from large datasets. This study proposes a system called OMIS-DM that covers socio-cultural analyses, income/expense analyses, infrastructure analyses, fraud detection analyses and simplification, verification and similarity analyses based on SOA.

Seventeen scenarios were created through municipal employees' various requirements. All scenarios were designed to provide easy usage and detailed reporting. Municipal staff can perform analyses by using only one button and interpret analyses' results easily. Various graphics were used at user interface to provide easy reporting.

Local governments can perform their decision making process more rational, more accurate and faster through OMIS-DM and local government personnel can discover knowledge without having any theoretic information about data mining, by using developed business intelligence software OMIS-DM.

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References

- Aggarwal, C., Sun, Z. and Yu P. (2002) 'Fast Algorithms for Online Generation of Profile Association Rules', *IEEE Trans. Knowl. Data Eng.*, vol. 14, no. 5, pp. 1017-1028.
- Ahmadvand, A.M., Bidgoli, B.M. and Akhondzadeh, E. (2010) 'A Hybrid Data Mining Model for Effective Citizen Relationship Management: A Case Study on Tehran Municipality', *e-Education, e-Business, e-Management, and e-Learning*, 2010 IC4E '10. International Conference on, Sanya.
- Andrienko, G.L. and Andrienko, N.V. (1999) 'Data mining with C4.5 and interactive cartographic visualization', *User Interfaces to Data Intensive Systems, 1999. Proceedings.*
- Arthur, D. and Vassilvitskii, S. (2007) 'K-means++ : the advantages of careful seeding', *Proceedings of the eighteenth annual ACM-SIAM symposium on Discrete algorithms*, pp. 1027-1035

- Bayes, T. (18th Century) 'An Essay Towards Solving a Problem in the Doctrine of Chances'.
- Breunig, M.M., Kriegel, H., Ng, R.T. and Sander, J. (2000) 'LOF: Identifying Density-based Local Outliers', *ACM SIGMOD Record* 29:93.
- Han, J., Pei, H. and Yin, Y. (2000) 'Mining Frequent Patterns without Candidate Generation. In: Proc. Conf. on the Management of Data', (*SIGMOD'00, Dallas, TX*), *ACM Press, New York, NY, USA*.
- OLGU Computer Systems (2009) <http://www.olgu.com.tr/>
- Poles, S. and Margonari, M. (2009) 'A modeFRONTIER Application: Data Mining the Italian Municipalities', *Newletter EnginSoft*, vol. 6, no. 2, pp. 31-37.
- Solomon, S., Nguyen, H., Liebowitz, J. and Agresti W. (2006) 'Using data mining to improve traffic safety programs', *Industrial Management & Data Systems*, vol. 106, no. 5, pp. 621-643.
- Song, M. and van der Aalst, W. M.P. (2008) 'Towards comprehensive support for organizational mining', *Elsevier Decision Support Systems*, vol. 46, no. 1, pp. 300-317.
- Spielman, S.E. and Thill, J. (2007) 'Social area analysis, data mining and GIS', *Elsevier Computers, Environment and Urban Systems*, vol. 32, no. 2, pp. 110 – 122.
- Syväjärvi, A., Stenvall, J., Laitinen, I. and Harisalo, R. (2009) 'Information Management as Function of Data Mining and ICT in City Government', *EGPA 2009, Malta*.
- Quinlan, J.R. (1996) *C 4.5: Programs for Machine Learning*, Morgan Kaufmann Publishers.
- Zhou, G., Wang, L., Wang, D. and Reichle, S. (2010) 'Integration of GIS and Data Mining Technology to Enhance the Pavement Management Decision Making', *Journal of Transportation Engineering*, vol. 136, no. 4, pp. 332-341.

New Challenge to Fulfill e-Procurement Promises

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Abstract: Worldwide public e-procurement has been linked to a myriad of promises, but in practice, it has achieved little. Even though, there is a tendency in the literature to document relative successes more than failures, partial implementations or unaccomplished objectives, there are a series of factors that can be garnered that are important to the success or failure of these initiatives. Our research, however, shows that to date all of this research has failed to recognize that e-procurement is a disruptive innovation, based on also disruptive technologies. Recognition of this fact has serious strategic and organizational implications predicted by the literature. Empirical evidence suggests the relevance of recognizing and factoring in its implications as a key success factor.

Keywords: e-procurement, eGovernance, disruptive innovation, innovation management, networked society, interoperability, public administration challenges, public service management

1. Introduction

In the networked society, as citizens become savvy consumers of services through digital media, they expect a similar experience when it comes to public services. However, the literature and the evidence show that the State has lagged behind in the adoption of new technologies. This trend could be explained by the incremental nature of the State innovation adoption model and its characteristic risk aversion. This is compounded by the complexity and implementation time of technology projects that often exceed the capacity and permanence of government officials.

These limitations contrast with the growing number of countries and regions pursuing some form of eGovernment to develop and deliver high quality, seamless and integrated public services, to redefine and improve their government-constituency relationships, and to provide a better support for local, national or international development (Grant and Chau 2006). In this quest e-procurement is among the first government wide projects that are undertaken by governments in search for quick economic and political gains. Its importance lies in the fact that it necessarily crosses many institutional barriers and the silo mentality of many public managers.

The documentation of e-procurement implementations and experiences has been based primarily on relative successes rather than its failures or unmet promises. Our literature review reveals a list of important success factors. It also reveals that to date, all sources found failed to recognize that e-procurement is a disruptive innovation and such innovations have serious implications in the organizational design of such initiatives.

This paper seeks to underscore the relationship between e-procurement implementation and the consequences of a disruptive innovation. This is vital to a more complete understanding of why some efforts have been more successful than others. Empirical evidence suggests that this distinction has greater relevance since successful cases tend to coincide with organizational arrangements and the strategy to be followed by organizations that choose to adopt disruptive innovations. This could well explain literature gaps regarding the role of innovation adoption theory in the implementation strategy and in the organizational design of e-procurement national services.

This is pertinent globally. Efforts are being made across the planet to implement eGovernment and, although e-procurement has been one of the initial components in this incursion, it is still an early implementation. It is also important for administrations fostering e-procurement projects because most recent technological changes, although even more disruptive, when well designed and managed, substantially increase the probability of achieving their promises. In fact, they may become the technical and administrative foundation for subsequent eGovernment projects.

2. Research question

What are the design criteria required to maximize the possibility of a successful public e-procurement strategy in view of its disruptive nature and the fundamental role it must play contributing in building the foundation for eGovernment development?

3. Methodology

We reviewed the available published empirical evidence, starting with the literature on general concepts and descriptions of public e-procurement. From this we were able to: 1) list the most common e-procurement promises and benefits, and 2) rank the ones considered key success factors for implementation.

We then reviewed cases documenting e-procurement implementation in countries or regions. The literature showed that many of the promises had not been met and that some of those implementations had been cut short or aborted.

We identified the characteristics and phases affecting e-procurement platform adoption and implementation by analyzing international experiences. At the same time, an extensive review of the literature on innovation adoption gave the characteristics and conditions defining a disruptive innovation. We then examined where the characteristics and conditions converged.

While a gap exists in the literature because until now the two concepts had not been linked, we were able to obtain a sample of e-procurement models and implementation experiences in 39 countries that had been documented earlier and made available online. Finally, in order to see if what are considered advanced platforms and e-procurement models obeyed arrangements, conditions and procedures normally used to implement a disruptive innovation, we classified the countries using two criteria: 1) technical maturity of the platform, according to the practices implemented (Moon 2005); and 2) organizational and institutional arrangements used for implementation.

4. The context: Governance in the interconnected society

The rhythm and scope of IT in the past century was different from that in this century. In the past, governments progressed at a slower pace when adopting new technologies. Public Administration has an aversion to risk that alters decision-making, trend that is deepened by incentive systems, traditional decision-making patterns, account rendering mechanisms, hierarchal and rigid organizational structures, roles, motivation, size, resources, communication processes, institutional values and more (Moon 2005) (Berry and Berry 1999).

Incrementalism in the adoption of new technologies is inherent to the nature of the public sector, keeping governments below the technology adoption curve (Lindblom 1959). When technology was oriented towards automation (Rogers 1995), this was consistent with the incrementalist nature of governments.

Recent evolution enables very different forms of public sector organization (Dunleavy, et al. 2005) (Fernández-i-Marín 2011)(Margetts 2009)(Suk Kim 2007). At the very time when citizens expect more from the State, the current scenario is undergoing a complex transition. The State must live side by side with information age implications, with the inevitable Internet media that enables and reconfigures the distribution of power of several actors and with a growing number of interconnected citizens. New disruptive technologies -social media, collaborative platforms, cloud computing- enable the development and diffusion of new disruptive models to provide services. Therefore, it carries with it the need to incorporate the knowledge and the tools for designing and managing innovation into the abilities and skills set of public leaders and administrators.

5. E-procurement on the road to eGovernment

Diverse political, economic and social aspects converge on the subject of public acquisitions or State purchasing (K. Thai 2001) (Tether 1977). Good governance depends on compliance with the basic principles of transparency, integrity and account rendering (Wittig 2003) (Rasheed 2004). These are strong reasons to ensure management regulated under the multiple processes, regulations and contractual systems. However, this dynamic approach results in a paradox contrary to efficiency, effectiveness and savings and therefore against the objectives mentioned.

In view of its magnitude, complexity and impact, e-procurement is one of the first projects that governments seek to implement with regard to eGovernment (OECD 2003)(OECD 2004)(KSCeG 2003), rallying support on the basis of its attractive promises. The literature has consistently pointed to these promises:

- Ease of access to government information
- Elimination of entrance barriers
- Increased levels of transparency
- Increased efficiency in the governmental sector
- Better use of public resources
- Cost savings in data collection, transfer and transmission.
- Cost savings in goods and services purchased
- User/citizen focused online services
- Technological Integration

The literature shows that e-procurement has been approached from several dimensions. Beyond the conceptual aspects, the promises, rhetoric and documentation of early implementation cases, the subject has also been studied from the technological or information systems dimension (Panayiotou, Gayialis and Tatsiopoulou 2004) (Kishor, Guy and Sajeev 2006) and from the management or strategic dimension (Coulthard and Castleman 2001)(Rajkumar 2001). Attempts have also been made to measure its economic impact and benefits in multiple areas. Nevertheless, the latter is not relevant in terms of the success of future implementations, nor will it affect the direction towards integration and digitalization. Will it perhaps fail to evolve consistently with regard to public purchasing or will it forestall going in a direction other than the prevailing eGovernment logic? Besides the savings derived from e-procurement, given technological advances; its strategic value lies in paving the way for the creation of the interoperability platform required for the next electronic government developments. This extends from information architecture and software service rendering models, to service governance and the platform itself.

Our research question is not a trivial issue. Across the globe, investment and efforts have been significant, but many initiatives remained merely partial solutions or were aborted. Nor have adoption and diffusion processes between purchasing institutions and supplier companies progressed as anticipated. There is a need to improve our knowledge of what it takes to avoid failure in such an important endeavor. We have compiled the factors most frequently quoted by bibliographical sources and listed them by their frequency in Table 1.

Table 1: Ranking of success factors quoted in the literature

Success Factor	Literature
Explicit diffusion and change management strategy	[4][16][1][3][11][15][7][14]
Strategic management / Service and management orientation	[16][5][13][11][15][12][8]
Flexibility/capacity to incorporate all types of buyers/suppliers	[4][16][3][11][15][14][2]
System interoperability and integration	[4][16][5][6][7][12][2]
State capacity to adopt innovations	[10][8][19][11][7][12]
Leadership and political support	[16][8][19][3][7][14]
Security and control	[16][15][7][12][2]
Data and code standardization	[4][16][6][15][7]
Trained human resources: Hiring, development and retaining talent	[4][1][8][9][13]
Handling relationships with institutions/suppliers	[13][3][15][14]
Process re-engineering	[4][16][7][12]
Robust technological platform	[4][15][12][2]
Performance measurements/benchmarks	[4][16][12]
Expertise in public purchasing /Inclusion of best practices	[4][10][16]
End user training	[16][11][4]
Scalability potential /incorporation of new services	[10][7][14]
Legal Framework	[10][15]
Coverage/Internet access	[13]

Source: (Al-Moalla and Li 2010)=1, (Barahona, Elizondo and Jiménez 2009)=2, (Chan and Lee 2003)=3, (Commonwealth of Australia 2005)=4, (Croom and Brandon-Jones 2009)=5, (DeNardis

2010)=6, (Engström, Wallström and Salehi-Sangari 2009)=7, (Ha and Coghill 2006)=8, (Hyoung Lim 2010)=9, (Moon 2005)=10, (Pires and Stanton 2005)=11, (Rahim 2008)=12, (Reddick 2004)=13, (Teo, Lin and Lai 2009)=14, (UN ESCAP 2006)=15, (Vaidya, Callender and Sajeew 2009)=16

Table 1 shows that little consideration is given to the government's capacity for innovation or to adopt innovations. In addition, there is little evidence compiled on the role of an organizational arrangement coherent with the type of innovation being implemented. Furthermore, there is no evidence on the particular subject of disruptive innovation.

We claim that there is a conceptual vacuum: the literature does not refer to the fact that e-procurement implementation in the public sector corresponds to the implementation of a disruptive technology. Consequently, has not been able to consider what the appropriate organizational arrangement should be.

6. Disruption in public procurement

E-procurement is an innovation and, as such, requires management (Somasundaram and Damsgaard 2005)(Govindarajan and Trimble 2010). To manage innovations, it is fundamental to differentiate between the types of innovation. Future decisions that may be vital to the success of the implementation depend on understanding the type of innovation (Trott 2011).

Sustained innovations have a constantly improving track record within a typical level of competition. Organizations are continually improving their products or services in response to customer demands. This dynamic approach is predictable and can guaranty success because needs remain stable over time (Bower and Christensen 1995)(C. M. Christensen 1997).

Disruptive innovations do not constitute an improvement in the performance of an existing product or service. This is true because instead of maintaining a constantly improving track record, disruptive innovations tend to disrupt this track record, generating a product or service radically different from the one being offered (Bower and Christensen 1995)(OECD 2005).

We claim that advanced e-procurement complies with the characteristics and conditions of a disruptive innovation.

Disruptive technologies are associated with disruptive business models that enter the market in the form of Innovative products or services. These types of technologies disrupt the relationship of the organization with its clients and suppliers and disrupt financial arrangements for its current market and technology (C. M. Christensen 1997)(Paap and Katz 2004).

A national platform for advanced e-procurement will relocate most of the technical knowledge from procurement experts, administrative lawyers and institutions to the platform itself, lowering the entrance barriers for small suppliers previously unable to participate in this market. It will also make possible to small public organizations to be as effective as the big ones.

Modern technology makes it possible to have a unique database of products under a global product classification (GPC)¹. This allows the platform to consolidate purchases as well as allowing new forms of offering and bidding. This creates ways of doing business with the government in a totally different fashion with a whole new and bigger set of participants, with a radically different cost structure.

It is also allows for a unique national registry of providers and products, which automatically creates a national base of suppliers, as opposed to a small set of vendors willing to register for a small subset of institutions. This creates a competitive marketplace of unparalleled transparency. See Table 2.

It is difficult for an already established organization to respond effectively to a disruptive innovation (this difficulty is greater for public organizations). Ordinarily, organizations delegate the implementation of a new project to a department, internal area, or work team created for that purpose. No matter the arrangement, these teams must be able to fit the project into the organizational culture, values, processes, structures and resources. These elements were designed for tasks directly related

¹ GPC gives buyers and sellers a common language to group products the same way globally to ensure effective data synchronization in the Global Data Synchronisation Network (GDSN). Source: <http://www.gs1.org/gdsn/gpc>

to core business. A disruptive technology under these conditions is doomed to fail (C. M. Christensen 1997) (Christensen and Overdorf 2000) (Charitou and Markides 2003) (Thomond, Herzberg and Lettice 2003).

Table 2: Rationale on the compliance of e-procurement with the characteristics and conditions of disruptive innovation

Characteristics of a Disruptive Innovation	E-procurement rationale
Initially there is no demand for them, the client base is small and may be costly	Supplier's perspective: Big sellers already know how to operate the traditional system and its cost and complexity act as an entrance barrier. Most small and medium enterprises (SME) do not regard public institutions as their potential client and are not willing to invest time and money in learning since it is complex, expensive and usually perceived as non-transparent. Buyer's perspective: most will argue that they are somewhat unique and will argue that it is better to keep the processes internally controlled.
Initially they are not attractive to the company's best clients	For those already selling, all existing hurdles act as a protection against new entrants. For large buyers, the lack of an effective efficient national system has led them to set up their own systems and they will distrust any attempt to do something on a national scale that will eliminate the system they use.
At some level they exceed the current abilities of traditional clients	Without an advanced e-procurement system, sellers have significant knowledge of administrative contracts. They know "who is who" to influence their purchasing bids and awards and they have on-site professional bidders who are experts "navigating" the system and dealing with all the red tape. An advanced e-procurement system incorporates the technical and legal know-how in its electronic code (software), evaluations are mechanized and the face to face contact between buyers and sellers tends to disappear.
They are at a new level of competition	If the barrier involving purchasing through manual or fragmented systems is lowered, then new competitors will arrive. Locally, smaller companies adopting the tool due to lower costs and simplicity, but also it will facilitate international bidders as well.
The meaning of quality and improvement are different for each model	It will go from a legalistic system, which mostly controls compliance with regulations, to one that is focused on customer service and running a robust technological platform under concepts such as service level agreements.
They address potential sectors/clients that under the prevailing logic would not have access to the product or service	The advanced e-procurement system facilitates joint purchases. It also makes it easier for several small organizations to use the system to participate in larger bidding rounds without joint coordination. More small bidders can participate in small and large purchases.
Initial profit margins may be small	This is not as clear for the State, but the objections to the project often involve cost benefit reasons, favoring versions of e-procurement that simply use Internet to upload and download pdf's, without any real change in the business model. It is not until the system is fully online and horizontally integrated; enabling radical new forms of State purchasing that e-procurement promises are finally met.

Source: **Characteristics of a Disruptive Innovation** prepared based on (Christensen, Johnson and Rigby 2002)(Bower and Christensen 1995)(C. M. Christensen 1997)(Christensen and Overdorf 2000)(Charitou and Markides 2003)

Disruptive innovations require a new set of resources, processes and values. They must face significant hardship to overcome challenges based on an organization that develops the product or serves the market while threatened by this disruption (Govindarajan and Trimble 2005), for example:

- Don't underestimate the potential of these disruptive innovations because of their immaturity
- Changes in the company's relationship with its clients and suppliers.
- Marketing: attempt by the Innovative vendor for adoption by market.
- Definition of product performance on the disruptive market is totally opposed to the improvements required to triumph under the traditional competition model.

- Beware of excessive precautions and dependence of the incremental innovation, to the detriment of transforming or disruptive innovations.
- During booms, do not get carried away by the good times and believe unnecessarily in the growth of new sources of innovation.

This means that a viable introduction of a new product or service based on a disruptive technology makes the case for a new and independent organization with other values and skills, not threatened by the new possibility of how to do things, and that does not see the possible market in the same way as the threatened entity. It does not keep anything from the one it is replacing. At the highest level, it may have a contact or two that facilitate the use of some resources; but the new one “forgets” how the original one did things and how it saw its clients. Otherwise, there is a risk that the new organization will remain immersed in the assumptions, values and decisions of the parent company (Mintzberg 1979)(C. M. Christensen 1997)(Slater and Mohr 2006).

Public entities, by their very nature, are less flexible when making structural changes. In view of this, just as in e-procurement efforts, the adoption, implementation and diffusion of a disruptive innovation within a public organization is more prone to non-compliance or failure, than the success and satisfaction of interested parties. This leaves few options for the public entity that must implement disruptive innovations: 1. Not do anything and ignore the imminent disruption (focus on normal operations), 2. Adopt the innovation but create a separate division or organization (Paap and Katz 2004) (Christensen, Raynor and Anthony 2003)(Markides 2006)(Sandberg 2002)(Carayannis, Gonzalez and Wetter 2003).

The new organization in the case of advanced e-procurement, will focused on promoting its adoption, operating the platform, developing new products on the basis of its technical and organizational interoperability abilities and developing and controlling new higher standards of service. These are not the usual abilities of governments and one should expect that those closer to this goal have been developed by independent public agencies or organizations. Therefore, we looked for empirical evidence to see if practice was consistent with our claim.

7. Results

Research was done on the empirical evidence available in the literature. We studied 39 countries with nationwide e-procurement implementations. We classified the countries using two dimensions: 1. Level of technical maturity of the platform according to the practices implemented (Moon 2005), consequently, simple e-procurement practices consist of those systems that have Web-based information dissemination and electronic ordering and automated procurement systems. While advanced e-procurement practices consist of those platforms that permit suppliers to bid online and conduct reverse auctions. And 2. Their organizational design: implementation conducted from the internal structure of the controlling institution (usually a Ministry of Finance) or implementation conducted from an external entity or agency (that may or may not be subject to the controlling institution).

Our results are organized in a Cartesian plane. The X-axis refers to the technical dimension and the Y-axis to the organizational dimension. The empirical observation supports our claim as it clearly shows that those in advanced stages are developed and managed by an independent agency. See Figure 1.

8. Discussion

Our research findings have important implications for public policy, public management, electronic government and the theory of disruptive innovations. Given its disruptive nature, national state-wide e-procurement should be done by an independent new agency with resources, processes and values different from those of the incumbent procurement officers.

In a broader sense, new technologies that enable service oriented information architectures, centralized management of giant secure databases instantly accessible from any part of the world, ubiquitous access to the Internet, nearly universal access through mobile devices by citizens and companies of any size, and technical and semantic interoperability create the possibility of generating disruptive innovations to produce not only better public services, but also new services or reach segments not adequately addressed to date or not addressed at all. In other words, our observations

regarding the risks of not considering the disruptive character of national electronic public purchasing can be generalized for other government electronic initiatives.



Source: prepared based on (European Commission Internal Market Directorate-General 2010) (IDB 2008) (Lim, Kim and Lee 2008) (Shin and Sub Park 2004) (Korea Information Technology Promotion Agency 2007) (ESCAP, Service and Bank 2006) (IPZS 2004) (Commonwealth of Australia 2005) (Bof and Previtali 2010)

Figure 1: Location of e-procurement Implementation efforts, by the technical maturity level of the technological platform and by the organizational arrangement used by the entity or agency in charge

Cognitively, these new tools for public management are very difficult for many leaders to assimilate. This is particularly true for those brought up during the 1980's under the influence of New Public Management theories based mainly on the idea of decentralization and competition between public agencies and between public agencies and the private sector as a mechanism to improve efficiency. A successful implementation of e-procurement may provide a demonstrative effect to facilitate the adoption of these new ideas.

At the highest level of decision making this results should help decision makers to decide on an organizational design that allows an independent agency to run e-procurement services based on the latest technologies that facilitate interoperability and horizontal integration, whose leaders and management are true innovators that are not only technologically savvy, but also have the managerial sophistication, culture and values to run it based on service level agreements.

On the other hand, it also provides a framework to understand the arguments of those opposing such organizational arrangement. It is not only a matter of losing power, if implemented accordingly with the ideas and evidence presented in this paper, they will not be part of the new organization. Critique and resistance will also come from other public officials who are familiar with a context of incremental innovation, where the idea of small steps and little internal confrontation prevails. With regard to the theory of disruptive innovations, our work extends this concept to the public sector where few studies have been conducted and the topic of public purchasing is discussed for the first time in this study. Our findings suggest the validity of using this theory in the public procurement realm.

The Next Step

Continue this work in at least two directions. One possibility is to increase the number of initiatives studied to cover a larger number of countries. Another possible direction is to document a sufficient

number of cases of national e-procurement with special emphasis on organizational and leadership aspects for a more detailed determination of the obstacles and advances derived from the organizational model selected.

References

- Al-Moalla, Abdulrahman, and Dong Li. "Organisational Issues with Electronic Government Procurement: A Case Study of the UAE." *EJISDC* 3, no. 41 (2010): 1-18.
- Barahona, Juan Carlos, Andrey M. Elizondo, and Gustavo Jiménez. "Hacia un modelo de compras electrónicas costarricense." CLACDS - STGD, 2009.
- Berry, R. S., and W. Berry. *Innovation and Diffusion Models in Policy Research*. In P. Sabatier (Ed.), *Theories of the Policy Process* (pp. 169-200). Boulder, CO: Westview., 1999.
- Bof, Francesco, and Pietro Previtali. "National models of public (e)-procurement in Europe." *Journal of eGovernment Studies and Best Practices* (IBIMA Publishing), 2010.
- Bower, J., and C Christensen. "Disruptive Technologies: Catching the Wave." *Harvard Business Review*, 1995.
- Carayannis, Elias G., Edgar Gonzalez, and John Wetter. "The Nature and Dynamics of Discontinuous and Disruptive Innovations from a Learning and Knowledge Management Perspective." In *The International Handbook on Innovation*, by Larisa V. Shavinina. Elsevier Science Ltd., 2003.
- Chan, Joyce K. Y., and Matthew K. O. Lee. "SME E-procurement Adoption in Hong Kong - The Roles of Power, Trust and Value." *Proceedings of the Thirty-Sixth Hawaii International Conference on System Sciences, IEEE*. 2003.
- Charitou, Constantinos D., and Constantinos C. Markides. "Responses to Disruptives Strategic Innovation." *MIT Sloan. Management Review.*, 2003.
- Christensen, Clayton M. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Harvard Business School Press, 1997.
- Christensen, Clayton M., Mark W. Johnson, and Darrell K. Rigby. "Foundations for growth: how to identify and build disruptive new business." *MIT Sloan. Management Review*, 2002.
- Christensen, Clayton M., Michael E. Raynor, and Scott D. Anthony. "Six Keys to Building New Markets by Unleashing Disruptive Innovation." *Harvard Business Review*, March 2003.
- Christensen, M. Clayton, and Michael Overdorf. *Meeting the challenge of disruptive change*. Harvard Business Review, 2000.
- Commonwealth of Australia. *Case Studies on E-procurement Implementations: Italy, New South Wales, New Zealand, Scotland, Western Australia*. Commonwealth of Australia, 2005.
- Coulthard, D., and T. Castleman. "Electronic Procurement in Government: More Complicated Than Just Good Business." *9th European Conference On Information Systems (Ecis2001)*. Bled, Slovenia, 2001. 999-1009.
- Croom, Simon, and Alistair Brandon-Jones. "Key Issues in E-procurement: Procurement Implementation and Operation in the Public Sector." Chap. Chapter 21 in *International Book of Public Procurement*, by Khi V. (Ed.) Thai. 2009.
- DeNardis, Laura. "EGovernance Policies for Interoperability and Open Standards." *Policy & Internet* 2, no. 3 (2010).
- Dunleavy, Patrick, Helen Margetts, Simon Bastow, and Jane Tinkler. "New public management is dead: long live digital era governance." Edited by EDS and London School of Economics and Political Science. *Public Policy & Services* (EDS Innovation Research Programme: Discussion paper series) N° 4 (2005).
- Engström, Anne, Åsa Wallström, and Esmail Salehi-Sangari. "Implementation of Public e-procurement in Swedish Government Entities." *Proceedings of the International Multiconference on Computer Science and Information Technology*. 2009. 315 – 319.
- ESCAP, United Nations, Public Procurement Service, and Asian Development Bank. *E-procurement*. United Nations publication, 2006.
- European Comission Internal Market Directorate-General. "Study on the evaluation of the Action Plan for the implementacion of the legal framework for electronic procurement (Phase II): Country Profiles." Brussels, 2010.
- Fernández-i-Marín, Xavier. "The impact of eGovernment promotion in Europe: Internet dependance and critical mass." *Policy & Internet* 3, no. 4 (2011).
- Govindarajan, V., and C. Trimble. *10 Rules for Strategic Innovators: From Ideas to Execution*. Boston, Massachusetts: Harvard University Press, 2005.
- Govindarajan, Vijay, and Chris Trimble. *Te other side of innovation: Solving the excution challenge*. Harvard Business Review Press, 2010.
- Grant, Gerald, and Derek Chau. "Developing a Generic Framework for e-G." In *Advanced Topics in Global Information Management*, by Gordon Hunter, 393. London: Idea Group, 2006.
- Ha, Huong, and Ken Coghill. "EGovernment in Sinapore - A Swot and Pest Analysis." *Asia - Pacific Social Science Review*, 2006.
- Hyoung Lim, Joon. "Digital Divides in Urban EGovernment in South Korea: Exploring Differences in Municipalities' Use of the Internet for Environmental Governance." 2, no. 3 (2010).
- IDB. *Evaluación del Sistema Nacional de Compras y Contrataciones Públicas*. Santiago de Chile: Banco Interamericano de Desarrollo, Gobierno de Chile, 2008.
- IPZS. *Public Procurement in Europe*. Istituto Poligrafico e Zecca Dello Stato, Presidenza del Consiglio dei Ministri - Secretariato Generale - Dipartimento per le Risorse Umane e Strumentali, 2004.

- Kishor, Vaidya, Callender Guy, and Sajeev. "Critical factors that influence e-procurement implementation success in the public sector." (Journal of Public Procurement) 6, no. 1 & 3 (2006): 70-99.
- Korea Information Technology Promotion Agency. "Korea's eGovernment - Best Practice." Seoul, South Korea, 2007. 18.
- KSCeG. "Korea's eGovernment. Completion of eGovernment Framework." Special Committee on eGovernment, Korea, 2003.
- Lim, Gyoo Gun, Renee B. Kim, and Han Bae Lee. "Public e-procurement: The Korean On-Line E-procurement System (KONEPS)." *3rd International Public Procurement Conference Proceedings*. 2008.
- Lindblom, C. "The Science of "Muddling Through."." *PublicAdministration Review* 29 (1) (1959): 79-88.
- Margetts, Hellen Z. "The Internet and Public Policy." *Policy & Internet* 1, no. 1 (2009).
- Markides, Constantinos. "Disruptive Innovation: In Need of Better Theory." *The Journal of Product Management Innovation* 23 (2006): 19 - 25.
- Mintzberg, H. *The Structuring of Organization*. Prentice Hall, 1979.
- Moon, M. Jae. "E-procurement management in state governments: diffusion of e-procurement practices and its determinants." *Journal of Public Procurement* 5, no. 1 (2005): 54-72.
- OECD. *EGovernment in Finland*. eGovernment Studies, OECD, OECD Publishing, 2004.
- . *Oslo Manual: Guidelines for collecting and interpreting innovation data*. Third Edition. OECD and EUROSTAT, 2005.
- OECD. *The e-Government imperative*. eGovernment Studies, OECD, OECD Publications Service, 2003.
- Paap, Jay, and Ralph Katz. "Predicting the "Unpredictable": Anticipating Disruptive Innovation." *Research - Technology Management*, 2004.
- Panayiotou, N. A., S.P. Gayialis, and Tatsiopoulou. "An E-procurement System for Governmental Purchasing." *International Journal For Production Economics* (90:1) (2004): 79-102.
- Pires, Guilherme D., and John Stanton. "A Research Framework for the Electronic Procurement Adoption Process: Drawing form Australian Evidence." *Journal of Global Business and Technology* 1, no. 2 (2005).
- Rahim, Md Mahbubur. "Identifying Factors Affecting Acceptance of E-procurement Systems: An Initial Qualitative Study at an Australian City Council." *Communications of the IBIMA*, 2008.
- Rajkumar, T. M. "E-procurement: Business and Technical Issues." *Information Systems Management* (18:4) (2001): 52-62.
- Rasheed, H.S. "Capital Access Barriers to Public Procurement Performance: The Moderating Effects of Ethnicity, Gender and Education." *Journal of Developmental Entrepreneurship* 9 (2) (2004): 22-43.
- Reddick, Christopher G. "The Growth of E-procurement in American State Governments: A Model and Empirical Evidence." *Journal of Public Procurement* 4, no. 2 (2004): 151-176.
- Rogers, E. *Diffusion of Innovations*. 4th. New York: The Free Press, 1995.
- Sandberg, Birgitta. "Creating the market for disruptive innovation: Market proactiveness at the launch stage." *Journal of Targeting, Measurement and Analysis for Marketing* 11, no. 2 (September 2002): 184-196.
- Shin, Geon-Cheol, and Myung Sub Park. "Leaning form the Award-Winning Korean Public Procurement Service." *89th Annual International Supply Management Conference*. 2004.
- Slater, Stanley F., and Jakki J. Mohr. "Successful Development and Commercialization of Technological Innovation: Insights Based on Strategy Type." *The journal of Product Innovation Management* 23, no. 1 (January 2006).
- Somasundaram, R, and J. Damsgaard. "Policy recommendations for electronic public procurement." *The Electronic Journal of eGovernment* 3(3) (2005): 147-156.
- Suk Kim, Pan. "Emerging challenges to the public capacity in the era of evolving public administration: toward collaborative public management." *Asian Journal of Political Science*, 2007.
- Teo, Thompson S.H., Sijie Lin, and Kee-hung Lai. "Adopters and non-adopters of e-procurement in Singapore: An empirical study." *Omega* 37 (2009): 972-987.
- Tether, I. *Government Procurement and Operations*. Cambridge, MA: Ballinger Publishing Company, 1977.
- Thai, K.V. "Public Procurement Re-examined." *Journal of Public Procurement* 1 (1) (2001): 9-50.
- Thomond, Pete, Torsten Herzberg, and Fiona Lettice. "Disruptive Innovation: Removing the Innovators' Dilemma." *British Academy of Management 2003 Conference Proceedings*. 2003.
- Trott, Paul. *Innovation Management and New Product Development*. 4th Edition. Prentice Hall, 2011.
- UN ESCAP. *E-procurement*. Public Procurement Service, ADB Institute, United Nations publication, 2006.
- Vaidya, Kishor, Guy C. Callender, and A.S.M. Sajeev. "Facilitators of Public E-procurement: Lessons learned from the U.K., U.S., and Australian Initiatives." Chap. Chapter 23 in *International Handbook of Public Procurement*, by Khi V. (ed.) Thai. 2009.
- Wittig, W. A. *Public Procurement and the Development Agenda*. Geneva, Switzerland: International Trade Centre, 2003.

From Policy-Making to Community Building: A Survey On 19 Experiences of eParticipation

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Abstract: This paper analyses the results of a survey on 19 experiences of eParticipation. It focuses on the different uses of technological tools regarding the communication needs of citizen participation processes. First, it offers an analytical framework of ICT tools and functionalities, in the context of eParticipation processes. Second, it presents empirical evidence from a comparative perspective. Third, it draws some lessons from the cases analyzed and also reflects upon some theoretical aspects of eParticipation.

Keywords: eParticipation, citizens, communication, ICT tools

1. Introduction

Liberal democracies face a crisis of legitimacy of representative political institutions. Traditional citizen participation and political membership rates decline linked to a negative perception of the political sphere and its institutions (Pharr and Putnam, 2000). Political indifference does not mean, however, that citizens are more depoliticised. Citizens participate in politics through new, non-traditional and non-institutional mechanisms, and the consolidation of the Information Society has definitively incorporated Information and Communication Technologies (ICT) into political processes (Jacobs et al., 2009).

eParticipation, defined as the use of ICT to promote citizen participation in the political sphere, is often regarded as an opportunity to tackle the legitimacy crisis of representative democracies, fostering transparency, making better collective political decisions and facilitating the inclusion of citizens in the political process (Macintosh et al., 2009). On the other hand, institutional actors can be reluctant to these changes because eParticipation can cause a loss of control in agenda setting and communication channels.

The impact of ICT has been a recurring debate since their beginnings. On the one hand, the cyberoptimistic approach highlights the positive effects improving democratic practice, both quantitative (more citizens could take part politically) and qualitative (ICT facilitate deliberation and the adoption of the best collective decisions). On the other hand, cyberpessimistic theories question the capacity of ICT to facilitate the political participation of citizens, as digital participants are the minority who already participate offline (Negroponte, 1995; Rheingold, 1993, Becker et al, 2006). Beyond some normative bias and technological determinism implicit in these two approaches, a realistic position contends that ICT offer an opportunity for citizens to participate in politics, but also that traditional political actors and institutions continue to have a relevant role. So-called Politics 2.0 would imply greater capacity for participation for stakeholders, multiple dissemination channels and information broadcasters, and a certain loss of control for traditional actors (Peña-López, 2011; Sunstein, 2007). These elements become particularly important at the local level, where information can play on equal terms with supralocal spheres and traditional mass media, which can explain the growth of Citizen Participation 2.0.

The research presented here analyses the uses of technological tools in 19 experiences of eParticipation. It aims to explore the different uses of technological tools and to find evidence about the relation between communication needs and the use of particular technological tools. Moreover, while the study of the relationships between ICT and politics (and specifically on eParticipation) is often focused on single case studies, the research presented here includes a wide range of experiences that offers the possibility of a descriptive quantitative analysis (Ward and Gibson, 2009).

The structure of the paper is as follows. First, it presents the analytical framework used here introducing on the one hand the communication stages of participation processes and on the other hand the taxonomy of technological tools upon which the experiences analysed in the research are classified. Second, it presents the results of the analysis of the cases combining a quantitative and a qualitative approach. Finally, the paper reflects upon an ideal-type distinction found in the cases

analysed that can shed light upon further lines of research and also to the debates about the goals and outcomes of eParticipation processes.

2. Analytical framework of Participation 2.0: Communicative moments and technological tools

Arnstein (1969) proposed a model that has become a reference for the analysis of citizen participation which included a number of stages: manipulation, therapy (or “educating” citizens to have a positive attitude towards participation), informing, consultation, placation (or reducing conflict), partnership (direct involvement of citizens in decision-making), delegated power and, finally, citizen control. Derived from this model we find later evolutions such as the International Association for Public Participation (IAP2, 2007), Tambouris et al. (2007) the OECD model (2001) Lukensmeyer & Torres (2006), or Macintosh & Whyte (2008). As noted by Macintosh, the seminal contribution of Arnstein has influenced the contextual framework that must be considered when promoting a citizen participation process, such as certain stages of participation, its depth, the role and the actors that take part in the process or the moment when citizen participation occurs in the cycle of public policies. In this study we will also emphasize other relevant aspects such as the rules of participation, the technological tools and the communication process of the participation project, which give rise to what we can call “moments of participation”.

2.1 Moments of participation

The communicative environment in which citizen participation promoted by public institutions takes place has been barely analysed. Any participation experience implies the existence of a more or less formalised communication process between the institution promoting the process and the citizens. Generally, four elementary stages can be identified in all citizen participation processes (Rubio, 2008): mobilisation, development, closure and monitoring. These stages have specific communication needs.

Mobilisation requires communication planning aimed at the implication of potential participants in the project. Depending on whether it is aimed at citizens in general or a specific target group (for example, young adults), the channels of communication will be different. The main objective of this stage is to give credibility and visibility to the participation process. Information must be provided to citizens regarding the reasons and importance of the participation process, and the expected results or benefits -individual or collective- of the participation. The information must define organisational aspects such as who participate, when, the issue and through which mechanisms.

During the *development* of the process, communication must provide significant (and accessible) information about the issue under discussion and the dynamics of the process itself (progress made, characteristics of the contributions, etc.). However, the fundamental part of this moment is the content of effective participation, how these contents are gathered by the promoting institution and how will respond to them (or if they are disseminated among the participants to establish a deliberation process). Communication may vary depending on the depth of the participation process, according to whether the intention of the process is to provide information to citizens, make a consultation, involve them to provide input for decision-making, request their direct collaboration in the decision-making process or empower them to take the political decision collectively.

At the *closure* stage, communication basically focuses on providing feedback to citizens' contributions identifying how they have influenced the final collective decision. As in the previous stages, the characteristics of the participation process will condition the communication parameters established between the public institution and citizens.

During *monitoring*, communication must focus on the usefulness of the participation process. To the extent that the process aims to achieve measurable objectives through indicators, the moment of assessment may go beyond the gathering of subjective impressions of the participants. Thus, it must inform the citizens how their participation has influenced the success of the process.

2.2 Participation tools

ICT are used throughout the participation process, but it is possible to discriminate between the different technological tools and applications depending on their communication objective and their

directionality. Based upon previous works (Dalakiouridou et al., 2009; DEMO-net), we have built a classification of the most common technological tools available following this twofold criteria. Regarding their communication objective, tools can be particularly suitable for one-to-one communication, one-to-many communication or many-to-many communication. Regarding directionality, we find suitable tools for unidirectional or bidirectional communication, while a third group is characterised under this approach by allowing hybrid uses. Beyond other attributes (price, skills needed for their use, etc.), the use of ICT in each of the moments of the participation process basically depends on the type of communication that is to be established with the citizens who take part in this process. Table 1 classifies the tools as a result of the crossover of the qualitative and quantitative approach:

Table 1: Classification of tools

	Unidirectional	Asymmetric bidirectional	Symmetric bidirectional	Hybrid
One-to-one			MMS SMS	
One-to-many	Aggregator (1) Shared documents (2)	Surveys / Consultations (3) Events / Agenda (4) Websites / Content managers (5) Collection of signatures(6)		
Many-to-many		Blog (7) Photography (8) eCommerce platforms Podcast / Sound Webcasting / Screencasting (9) Video (10)	Collaborative documents (11) Forum (12) Collaborative management of projects Map / IMS (13) Social marking Virtual reality / 3D worlds Teleconference Wiki (14) Professional Network Social Network / Virtual Community (15) Chat (16)	
Hybrid			E-mail (17) Games Nanoblog (18) Simulations (19) Electronic vote (20)	Campaign Management Mashup
Numbers in brackets indicate examples of the use of the tool: (1) Today I Decide, (2) London Safety Plan, (3) North Western Ontario, (4) Croydon, (5) Harringay, (6) Cidade democratica, (7) Harringay, (8) Linköping, (9) Mental Health Strategy, (10) San Francisco , (11) Mental Health Strategy, (12) Talk Swindon, (13) Ask Bristol, (14) New Zealand, (15) San Francisco, (16) Nordpol, (17) Talk Swindon, (18) FEED, (19) Trikala. This is not to say that only one single tool has been identified for each case, as most of them use more than one tool.				

3. Analysis

The cases chosen represent good and innovative practices in the use of technological tools and the procedure itself. Data sources included banks of good practices and other internationally recognised experiences such as ePractice, DEMO-net, PeP-Net, Momentum, or People and Participation. Cases were incorporated from different countries such as Brazil, Canada, New Zealand, Estonia, Sweden, Greece or England. The research had a particular concern about local participation but the experiences analysed not only belong to this level of administration as the focus of the study is on how ICT can bridge the gap between citizens and representative institutions at a general level.

The research technique used is contents analysis, a methodology that enables valid inferences from contents or communication data such as the characteristics of the sender or the public it addresses, beyond a simple descriptive document analysis, and combined a qualitative and qualitative approach (Weber, 1985; Krippendorff, 1990). The cases were classified following a scheme that included *target* (general or specific), *scope* (territorial or not), *issue* (general participation or a particular policy area) *tools* (technological resources), and *moment* (of communication). A datasheet was drawn up with

these categories for each of the 19 cases and analyzed following the quantitative/qualitative distinction.

A first exploratory analysis showed how two out of three cases are conceived as general citizen participation processes. Among those with a specific theme, there are a large number of cases linked to young people (which have a double dimension: issue and target group) and to the various areas of town-planning. The quantitative analysis presented in the next section focuses on which tools are used in the participation experiences and, particularly, with what purpose. Secondly, the qualitative analysis focuses on the use and performance of citizen participation processes, presented as seven 'learning lessons'.

3.1 Quantitative analysis

The analysis of the participation experiences found 20 different tools, and usually different applications are available for each tool (that is, a blog is a tool while Blogger or WordPress are applications). The most frequently used tools in the cases analysed are surveys/consultations (used in 9 of the 19 participation experiences), forums (in 8 experiences), and social networks (in 6). On the contrary, five tools have been applied only in a single case: simulation, chat, collaborative documents, calendars and blogs. The uses show a progressive incorporation of advanced technologies rather than innovative uses. In fact, the most frequent tools are typical of the first stage of the Internet (38 uses), although Web 2.0 tools have acquired a significant use too (29 uses). Only one of the experiences, *Federated eParticipation Systems for Cross-Societal Project*, introduces third generation Internet tools (so-called semantic or intelligent Web). The tools used in the 19 international were classified following the distinction between type of communication and directionality:

Table 2: Frequency use by types of tools

	Unidirectional	Asymmetric bidirectional	Symmetric bidirectional	Total (horizontal)
One-to-many	8	23		31
Many-to-many		7	23	30
Hybrid			6	6
Total (vertical)	8	30	29	Total (67)

Bearing in mind the criterion of the type of communication, one-to-many (31) and many-to-many communication (30) tools -which are more typical of Web 2.0- are numerically similar. On the contrary, there are few tools enabling hybrid communication (both one-to-many and many-to-many). With regard to the direction of communication, the most frequent tools allow for bidirectionality (59). Within these tools, the distribution is quite similar between asymmetrical (such as surveys, agenda or webcast) and symmetrical communication between users (forum, wiki, social network, etc.). From this perspective, two sub-groups can be identified: tools enabling one-to-many communication with asymmetric bidirectionality; and tools enabling many-to-many communication with symmetric bidirectionality. Rather unsurprisingly, the analysis suggests a widespread use of bidirectional tools between the organisation promoting the participation initiative and the target public. This points to an emerging trend: from participation based on a vertical style of communication, aimed at providing information to citizens, towards a more horizontal model, open to participants' opinions and demands.

Finally, table 3 shows -with horizontal percentages- that the use of tools is more intensive in the mobilisation and particularly the implementation stages. 16 out of 20 tools have been used during the moment of mobilisation of the participation initiative and 19 during the moment of implementation. The number of tools applied during the closure and monitoring stages of the citizen participation initiatives is 7 and 8, respectively. Therefore, the cases examined have used technological tools for two main purposes: first, to inform about the citizen participation initiatives and to obtain the involvement of the target public; and second, to execute or implement the participation initiatives.

Four large groups can be identified based upon this analysis depending on the number of moments in which they are used. The first group includes tools that are only applied in one moment of the participation process: blogs, collaborative documents, shared documents and simulation. Moreover,

most of them appear only in one participation experience, that is, these are scarcely used specific tools for one moment in the participation process (implementation or development).

Table 3: Use of by participation moments (horizontal %).

Tool	Moment 1 Mobilisation	Moment 2 Development	Moment 3 Closure	Moment 4 Monitoring
Aggregator	40%	20%	20%	20%
Blog	100%			
Collaborative document		100%		
Shared document		100%		
Electronic vote	20%	40%	20%	20%
Survey/Consultation		45%	55%	
Events/Agenda	40%	60%		
Forum	23.1%	61.5%	7.7%	7.7%
Photography	33.3%	33.3%		33.4%
Map	33.3%	66.6%		
Nanoblog	50%	50%		
Websites	55.5%	11.1%	33.3%	
Petitions	28.6%	42.8%	14.3%	14.3%
Simulation		100%		
Video	66.6%	33.3%		
Electronic vote		50%	50%	
Webcast	50%	25%		25%
Table 3 (Cont.) Tool	Moment 1 Mobilisation	Moment 2 Development	Moment 3 Closure	Moment 4 Monitoring
Wiki	25%	75%		
Social Network	63.6%	18.2%		18.2%
Chat	33.3%	33.3%		33.3%

To better understand the use of these tools it is worth referring to some of the cases. For instance, the *London Safety Plan* Project aims to define a plan of action for the London Fire Department, while the City of Trikala (Greece) aims to create a new methodology of eParticipation, including the use of shared documents to guide the citizen consultation and debates contemplated in the different projects. Something similar could be said regarding the use of the collaborative document tool in the *Mental Health Strategy for Canada* project, an initiative that aims to share ideas for policy agenda setting for which, among other tools, a space is used where users can send their opinions and experiences, in order to help the rest reach their own opinion on the issue.

The second group is formed by six tools that are usually concentrated in two moments of the participation process. Survey/consultation is used in the implementation and closure stages, while events/agenda, map, nanoblog, video and wiki are used in the mobilisation and development stages.

Survey/consultation deserves specific attention, as it is the most frequently used as it performs an important function when demanding citizens' opinions and preferences in relation with the specific themes, such as the definition of priorities and new ideas in the health policy for the Ontario province (*Share Your Story, Shape Your Care*) or the discussion of matters of political interest (*Talk Swindon*). Surveys are also used in the closure stage of the participation process, particularly to determine which of the presented alternatives is preferred by the users, as in *Ask Bristol* or in the *Scottish Youth Parliament*, where the survey of young people also works as a kind of vote on the different proposals to be incorporated in the *Youth Manifesto*. As mentioned above, some of the tools in this group are used simultaneously in the mobilisation and implementation stages. For example, the events/agenda tool is used in the *Talk Swindon* Project to inform about events of interest for capturing the attention of citizens and obtaining their involvement in the deliberation process (mobilisation), as well as guiding the discussion among citizens (implementation).

The third group comprises tools which are applied in three of the moments of the participation process –photography, websites, webcast, social network and chat-, basically in the first two moments and in the fourth. The main function of these tools is to inform about the results of the participation experience, not as a closed event, but as a reality susceptible to review and assessment. This can be seen, for example, in the *Mental Health Strategy for Canada* project that incorporates a webcast (in real-time) on users' experience during the process. Social network is the most used tool, particularly for mobilising citizens in the participation initiatives. A good example of the potential of this tool is the case of the *San Francisco Facebook*. Although it is not a specific citizen participation project, the large number of followers and the level of activity shows its usefulness for transmitting information about local activities, acting as a civic portal to the administration and facilitating the civic monitoring of town council's activities.

The last group comprises the most versatile tools used in the four stages of the participation processes: aggregator, e-mail, petitions, electronic vote and forum. A clear example of the recurrent application of these tools is the project *Today I Decide* of Estonia, aimed at incentivising citizen participation in the process of drafting legislation, and where citizens are up-to-date with the proposals that are to be transferred to the public administration with the monitoring of the debate surrounding the matters and the final vote among the users.

3.2 Qualitative analysis

Besides the quantitative evidence presented in the previous section, a qualitative analysis of the information about the specific use of technological tools in the 19 experiences of eParticipation included in the research allows to draw some conclusions that may be helpful for public participation initiatives. These elements can be summarised as seven learning lessons related to different aspects of the participation process:

- Registration of the users of electronic participation tools

Some of the experiences require the citizens interested in transmitting their comments and opinions to register, in order to prevent misuse or offensive contents. To encourage inscription it is a good idea to state that the inscription process is very simple and does not take up too much time. For the participation tools that do not contemplate the entry of comments (such as the survey) a registration system is not so necessary (in *Imagine Croydon*, for example, it is not required). Thus, the question of registration raises a trade-off between, on the one hand, the cost of registering (basically time) and, on the other, the benefit for the quality of participation (for example, personal insults are avoided).

- Complementary nature of online and offline tools

The use of online tools does not exclude the possibility of offline participation. In fact, one of the keys to the success of some of the initiatives (such as *Nordpol*) comes from the combined use of both types of strategies. This is particularly relevant during the first stages of the participation process, when disseminating the participation initiative and involving the target public can involve the use of online and offline tools, from e-mail, social networks or events/agenda, to leaflets, booklets, or information and advertising in traditional media.

- Clear and concise description of the objectives and functioning of the participation initiatives

The participation initiatives must offer concise and clearly visible information on key questions such as the description of the initiative, leading institution, objectives, duration, etc. Lack of information can generate confusion and reluctance among potential users. While this can seem obvious, basic data

about the participation process is not explicitly stated in some analysed experiences. One clear example is *Talk Swindon*, an online discussion forum that has been working since 2006 and is very dynamic in both themes and participation. However, the objectives and the promoting institution are not clearly defined on the website (although it does specify the rules for participating in the forum). Brief and educational explanation about the different technological tools and their function is also an important aspect, including if it is necessary to register or not, guidance on how to attach documents, and so on. Another element is the indication of basic rules for participation. For instance, *Talk Swindon* is a good example as it indicates a detailed set of rules, specifically regarding the use of the forum, defamation, cookies and privacy, and the current legislation on intellectual property and copyright.

- Free versus proprietary software

Free software tools offer some advantages for online participation processes. They usually are cheaper than proprietary technology though they usually still need specific IT development and management especially when customisation is required. On the other hand, it facilitates the possibility of reproducing it in other territorial areas and sectors. It also provides a greater control over the tool, a freedom that is lost when the tools are offered by a private company.

- The visibility of the project administrator

As mentioned above, precise information has to be provided regarding the promoting institution but it must also have an active and visible role throughout all the stages of the citizen participation process. It is good that users are able to identify that there is an administrator of the initiative that looks out for its correct development, providing relevant information, moderating –when required- a discussion forum, summarizing opinions, disseminating results, etc. Otherwise, users may feel that the promoting institution is not sufficiently involved in the initiative and that their comments and opinions will get lost. Again, *Talk Swindon* is a good example: the administrator is visible in many of the themes discussed on the forum, in the role of facilitator and enabler of the debates.

- Accessibility of the participation initiatives

The perception of accessibility and proximity to citizens of the initiatives conditions the final level of citizens' participation and involvement. Even when a project looks for active participation, if citizens consider it to be far from their reality and interests it is unlikely to be successful. Some of the examined initiatives have designed the contents of their websites based on this approach. This is basically seen in two aspects. First, incorporation of bidirectional communication –whether symmetric or asymmetric- tools favours citizens' involvement in the participation process. Second, the specification of a section entitled “contact us” section, via e-mail or postal address, etc., where users can send opinions and suggestions must be accompanied by a commitment to deal with the comments received. This channel of communication must be visible and easily accessible so that users can have a point of reference to contact with the managers of the initiative.

- Proactive role of users

Some of the citizen participation experiences appeal to the proactive nature of the users, not just to take part in the experience but to disseminate it among people they know. Of the examined cases, *Imagine Croydon* is a case in point of this strategy. The website makes available a set of various ideas and tools for participants to apply them in meetings with friends and neighbours, including supporting materials such as boards or cameras or specific guidelines to manage group dynamics.

4. Concluding remarks: Overcoming the ‘moments’? From policy-making to community-building

The evidence presented in this paper shows there is a wide range of tools available for the specific communication moments of a participation process. Many of the cases analysed aimed at generating a specific output, whilst other emphasised citizens' engagement although they do not have a specific purpose. In other words, there is a differentiation between processes aimed at producing a public decision that could be qualified as *policy-oriented*, and participation processes that emphasise citizens' involvement generating a sense of belonging to the community, referring to what we can call *community-building*. These two models are not mutually exclusive but rather ideal-types that can be present in the same participation process, and may have many dimensions that help reflect on the different related elements of online citizen participation processes.

As suggested in Table 4, different elements can be associated with each participation model. A first element is the distinction between the most formalised processes with a structured design where every stage performs a specific function aimed at producing a specific result, and those more open processes, where users' participation is more informal and, therefore, generates more possibilities in different ways but also bear less possibilities of controlling the final result. The models aimed at specific policies emphasize the production of a pre-established result (whether a decision or a clear position regarding a public question), while the second fosters the interaction between community members and has a more relational nature. While the first model could be closer to traditional participation where the representation of citizens is formulated in a procedure aimed at generating a specific result, the second model is linked to the generation of a sense of belonging and engagement to the community, associated with social capital theories or the participation in social networks.

Table 4: Decision-making and community building

Elements	Policy-oriented	Community-building
Design	Formalised	Open
Aim	Decision-making	Relational
Citizen role	Representation	Engagement
Participation	"Traditional" participation	"Network" participation
Management	Guiding role	Facilitator role
Tools	From one-to-many	From many-to-many
(Communication)		
Tools	Unidirectional/Asymmetric	Symmetric
(Directionality)		

From the point of view of the organisation, the two models also have different implications. The organisation and people leading the process can take the role of guide and moderator when dealing with a structured participation process, where a series of steps is required at each stage of the decision-making process, from managing the communication to the methodology. In the case of community building projects the role of the organisation will tend towards actions in terms of facilitator and enabler of the network community where users participate.

Use of the tools can also vary depending on the nature of participation. In policy-oriented processes, the tools will be oriented at a specific function, whether it be an online questionnaire for gathering information, a newsletter for monitoring the process or electronic voting to produce a collective decision. Thus, on the one hand, one-to-many communication tools will play an important role for developing scheduled communication strategies to send the same information to a very large group of users. In the community-building model we find a significant presence of many-to-many communication tools with a strong bidirectional and especially symmetric component. The users themselves largely control the development of the participation process and facilitate the contents, emphasising the open and relational possibilities of participation.

These two ideal-types can be also interpreted in terms of the approach used to develop the participation process. In the first case, the local administration designs and centralises the project following a top-down approach, while in the second one citizens acquire greater influence and the administration is more open to their opinions and demands under a bottom-up approach. Moreover, experiences other than those promoted by the administration must be taken into account such as blogs, forums or social networks that generate opinions and debates regarding a municipality, a specific issue or group, and so on.

In terms of credibility and democratic legitimacy the costs of not following this new logic can be high for public institutions because they will be increasingly left out of the dynamic that is the driving force behind many of the daily activities of its citizens. The terms of inclusivity have been inverted: it is no longer the case of citizens being left out of participation processes but the institutions that can be left out of the citizen participation. In any case, this transition implies accepting the consequences of the new 2.0 politics. Otherwise, the risk is in a loss of visibility and nodality of the administrations in a changing environment (especially among the younger generations). On the other hand, it is possible to make the most of the fact that citizens have adopted Web 2.0 tools and are participating outside the traditional channels of institutionalised participation. Therefore, the key question is not whether the new media can capture, moderate and summarise citizens' voices, but whether the political institutions are able and want to enter into a non-hierarchical relation with them. The free environment

of these tools implies that it is the institution that must approach the citizens rather than a participation process where it is the citizen who approaches the sphere of the administration.

References

- Arnstein, S. R. (1969) "A Ladder of Citizen Participation", *Journal of the American Institute of Planners*, Vol. 35, No. 4.
- Blanco, I. and Font, J. (2005) *La participación local: factores estructurales, ideológicos e instrumentales*, Working Paper 42, Universidad Autónoma de Madrid.
- Becker, T. and Ohlin, T. (2006) "The improbable dream. Measuring power of Internet deliberations in setting public agenda and influencing public planning policies", *Journal of Public Deliberation*, (2) 1.
- Dalakiouridou, E., Tambouris, E. and Tarabanis (2009) *Mapping the state of play in eParticipation in the EU*. [online], Brussels: European Commission. http://www.european-eParticipation.eu/index.php?option=com_docman&task=doc_download&gid=99&&Itemid=82
- DEMO-net. "Tools", [online], <http://www.demo-net.org/what-is-it-about/tools>
- IAP2 (2007) *Spectrum of Public Participation*, [online], http://www.iap2.org/associations/4748/files/IAP2%20Spectrum_vertical.pdf.
- Jacobs, L.R., Cook, F.L. and Carpin, M.X.D. (2009) *Talking Together: Public Deliberation and Political Participation in America*, University of Chicago Press, Chicago.
- Krippendorff, K. (1990) *Metodología de análisis de contenido. Teoría y práctica*, Paidós, Barcelona.
- Lukensmeyer, C.S. and Torres, H.H. (2006) *Public deliberation. A manager's guide to citizen engagement*. IBM Center for the Business of Government.
- Macintosh, A. and Whyte, A. (2008) "Towards an evaluation framework for eParticipation transforming government". *People, Process & Policy*, (2) 1.
- Macintosh, A., Coleman, S. and Schneeberger, A. (2009) "eParticipation: The Research Gaps". In *Electronic participation*, Macintosh, A; Tambouris, E (eds.), Springer-Verlag, New York.
- Negroponte, N. (1995) *Being Digital*, Coronet, London.
- OECD (2001) "Citizens as partners: information, consultation and public participation in policy-making", OCDE, Paris.
- Pharr, S.J. & Putnam, R.D. (eds.) (2000) *Disaffected democracies: What's troubling the trilateral countries?*, Princeton University Press, New Jersey.
- Peña-López, I. (2011) "Striving behind the shadow – The dawn of Spanish politics 2.0". In S. van der Hof & M. Groothuis (eds.), *Innovating Government. Normative, policy and technological dimensions of modern government*, Cambridge Press / Asser Press, Cambridge.
- Rheingold, H. (1993) *The Virtual Community: Homesteading on the Electronic Frontier*. Addison-Wesley, Reading.
- Rubio, L. (2008) *La gestió de la comunicació en entorns de participació ciutadana*, Conference paper in "La gestió de la comunicació en entorn participatiu", Cerdanyola del Vallès.
- Sunstein, C.R. (2007) *Republic.com*. Princeton University Press, Princeton.
- Tambouris, E.; Liotas, N. & Tarabanis, K. (2007) "A framework for assessing eParticipation projects and tools". *Proceedings of the 40th Hawaii International Conference on System Sciences*.
- Ward, S. and Gibson, R. (2009) "European political organizations and the Internet", in Chadwick, A. and Howard, P. N. (eds.) *Routledge Handbook of Internet Politics*, Routledge, New York.
- Weber, R. P. (1985): *Basic Content Analysis*, Sage, Beverly Hills.

Alignment Dynamics in eGovernment: Behind the Scenes of Local Governments

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Abstract: Local governments are increasingly swamped by the endless possibilities that arise from information and communication technologies. They are challenged to incorporate ICTs in their daily processes and strive to thus become more efficient and effective organizations. Yet, a lot of factors come into play when ICTs are introduced within local governments. Soon organizational dynamics are entangled with the new dynamics that stem from the newly introduced ICTs. In this paper we explore the dynamic process of aligning local governments with technology by using the 7Smodel as a framework to analyze how seven different elements, both hard and soft, mutually affect each other and make out the local dynamics. We state that these elements influence how local governments deal with change, and in this respect, how they deal with technology. We stress the interrelations between the seven factors and the organizational dynamics as a result of the interplay between these factors to point out the complexity of the alignment process in local governments. Better insights in the organizational factors that encircle the implementation of ICTs will lead to a more profound understanding of how the process of alignment comes into practice in local governments. By taking into account the complex process of alignment ICT-projects will be more successful.

Keywords: eGovernment, evaluation, local government, organizational change, alignment process

1. Introduction

The implementation of new ICTs by governments seems to happen in a slower pace than expected (Meijer 2010) and tends to grow organically. About two decades ago, local governments in Flanders (the northern part of Belgium, home to the Dutch speaking community) began to acquire their first computers and applications. At first, there was no real strategy behind this. They started using these new technologies without realizing what the impact would be on the organization. In most cases ICT implementations were initiated by a limited number of people who saw new possibilities arising from using these new ICTs. Staff members interested in ICT developed their skills and competences further by using new tools and supporting their colleagues.

At first the technology was at the center of the attention, but increasingly the organization and how it changes and deals with technology became the prime of interest. That is because adopting and using (new) ICTs challenges the current ways of working and introduces new possibilities for the organization. eGovernment proves to be not only about the execution of daily routines and tasks, but also about the management of the everyday practices. There is a growing need for support by experts, new competencies in staff members and a well-considered and clear vision and strategy on the role of ICT for the organization comes into sight. In addition, there seems to be a shift from a technological support view towards a more strategic role for ICTs within the organization (Henderson and Venkatraman 1993). Local governments are challenged by technology to build their internal organizations around these new technologies.

Findings show that local governments differ greatly in how they deal with new kind of ICT challenges (Meijer 2010, Boudry et al 2009). Some of them succeed in reaping the benefits of new ICTs, but other struggle to incorporate ICTs in a way that the organization as a whole can benefit from it. This paper focuses on how organizations deal with change or in other words, how they struggle in aligning their organization with ICT and thus explores the variety in how they deal with this changing environment.

2. Alignment dynamics

2.1 Alignment as a process

In this paper we build on the alignment perspective which points out the importance of attuning the organization and its ICTs and the precarious balance between both. Initially, this idea of alignment was developed for application within a business context, but alignment models are increasingly

applied in the context of the adoption of ICTs by governments (e.g. Fedorowicz, Gelinas, Gogan, and Williams 2009, Meijer 2010). Like businesses, governments are also challenged to harmonize their organization's goals and activities and the information systems that support them (McKeen and Smith 2003, Chan and Reich 2007). Consequently, they experience a similar need for aligning their organizational and ICT dimensions.

Alignment within governmental organizations can be seen as a condition for achieving a better functioning and a more efficiently managed organization. It is a dynamic and ongoing process (Baets 1996, Rondinelli, Rosen and Drori 2001, Chan and Reich 2007) with different dimensions, such as strategic and structural dimensions, but also social and cultural elements (Chan and Reich 2007). Attempts have been made to identify factors that contribute to this alignment of organization and technology (e.g. Luftman 2003). But insights in the complexity of this alignment process and the elements that contribute or hinder this process tend to be rather limited. There is a need for insights in the complex and dynamic process of alignment and in different elements that contribute to this alignment process. Baets (1996) summarizes this by stating that *"it is not enough to simply understand the factors involved in alignment, one must understand the interrelationships among the factors"* (Chan and Reich 2007).

We elaborate on this idea of aligning organization and technology and aim for a better understanding of this process of alignment by building on the 7Smodel. This model is traditionally used for addressing how organizations deal with change and on how effective they are in this. The founding fathers of this model, Peters & Waterman (1980) distinguish seven factors that are interrelated and mutually reinforcing. These elements include both hard dimensions such as 'strategy', 'structure' and 'systems' but also soft dimensions such as 'style', 'staff', 'skills' and 'shared values'. By reviewing these seven elements we aim to contribute to the alignment literature by illustrating how alignment dynamics work and can be investigated in local governments.

2.2 Alignment strategies in local governments

Local governments differ notably in the way they make use of ICTs within their everyday functioning. Boudry et al (2009) demonstrate this by introducing a new type of classification that enables to evaluate the alignment status of local governments. The authors discriminate four ways in which local governments align both their organizational and their ICT-side. Two ways concern organizations that are aligned, the other two cover organizations that are not or disaligned.

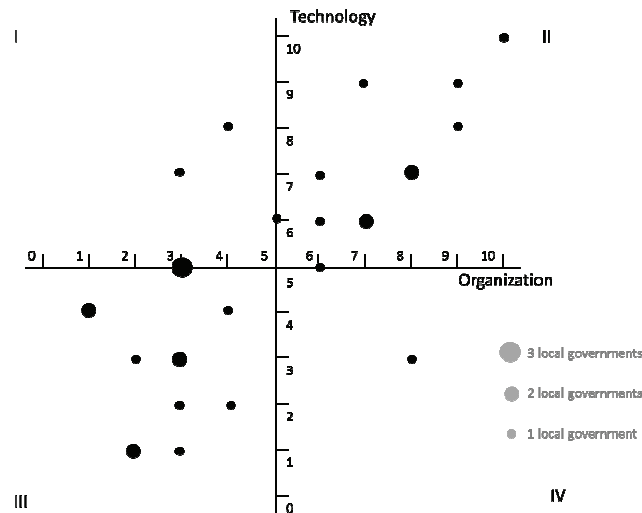


Figure 1: Alignment classification (Boudry et al 2009)

Aligned organizations (quadrant II and III) can be characterized by either a strong or a weak alignment. 'Strong aligned organizations' (quadrant II) succeed in a positive collaboration between the organizational and ICT-side. They reinforce and challenge each other in becoming a better organization. In 'weak aligned organizations' (quadrant III) both the organization and the technology side lack the driving power to initiate any substantial changes. To a certain extent, they reinforce each other in a negative way and leave each other uninspired. In 'disaligned organizations' (quadrant I and IV) the organization and technology sides do not sufficiently join forces. The reasons for this mismatch

can be twofold. On the one hand, there are progressive organizations that do not get the support they need from their very technical-oriented ICT department (quadrant IV). On the other hand, the opposite occurs when rather conservative organizations are too much steered by a strong ICT department, which leads to an unbalanced growth of their organization (quadrant I). In short, technology and the organization do not necessarily evolve at the same pace, but technology can outrun the organization and vice versa. These findings should be seen as a snapshot of a process that illustrates that organization and technology can move in a different pace resulting in a time lag between business and IT planning processes also described by Van Der Zee and De Jong (1999).

We expect that a reinterpretation of the findings in these local governments will help to investigate the results in a more systematic way, in order to unravel the dynamic interrelationships of different organizational elements according to the different alignment statuses. Since there are only 3 organizations situated in quadrants I and IV, we see them as exceptions, therefore in this paper we will only focus on the organizations that are located in the quadrants II and III. Also the 5 organizations that lie on one of the axes will be left out of the analysis because we choose to focus on the two groups of organizations that can be defined as (strong or weak) aligned organizations. So, we will base our analysis on 21 of the total of 29 local governments investigated, consisting of 10 strong aligned organizations and 11 weak aligned organizations.

3. Methodological approach

We used a mainly qualitative approach for gathering the data in order to get as much as information on the dynamic relationship between an organization and ICTs, in an attempt to grasp the complexity in how local government deal with ICTs. The data at hand are collected by means of an ICT alignment audit in which a self-selecting sample of 29 Flemish local governments was used. In each local government the audit commenced with at least one introductory interview with in the town manager and in most cases the communications officer and/or the IT-professional. Next, a focus group discussion took place with people from different departments and positions and a non-limited discussion about leadership, management, strategy and policy, daily tasks, use of data, database management and the role of the IT-professionals within the organization. The qualitative data from the interviews as well as the focus groups were complemented with a document analysis for each individual local government on documents such as the organization chart and policy and ICT strategy documents.

For this study, the individual reports of the local government were analyzed by scoring each organization on the factors of the 7Smodel. As mentioned before, local governments attributed to quadrants I and IV and those situated on one of both axes were excluded from this additional analysis. The remaining 21 organizations were attributed a score of 0 to 2 on each of the 7S factors. We did so for both an organizational as well as a technology perspective. So, each local government was attributed a total of 14 scores. A score of 0 on a factor was given to the organizations where we found a poor execution within the local government cases investigated. A score of 1 on a factor was given to the organizations where we found an average execution within the local government cases investigated. A score of 2 on a factor was given to the organizations where we found an excellent execution within the group of the local government cases investigated. For example; City X can be characterized as a dynamic organization with a well thought-out strategy. They developed a series of key projects that reflect the main organizational strategic lines resulting from their interpretation of the Municipal Decree (= Score 2 on 'Organization-Strategy'). The management team used to focus too much on a practical agenda, but is growing in its 'steering role'. Members of the management team have a lot of good ideas but have problems communicating with the basis of their organization (= Score 1 on 'Organization-Style'). Staff members lack clear results of what the management team is doing. They are confronted with a high workload and focus only on their daily tasks. They are not inclined to think any further than what is in their job description (= Score 0 on 'Organization-Staff'). When it comes to ICT there is no ICT-strategy or plan (= Score 0 on 'Technology - Strategy'). The management team is not interested in ICT and leaves it to the ICT-department (= Score 0 on 'Technology-Style'). No one is in charge, the ICT-department is guided by the need for technical support of the staff members (= Score 0 on 'Technology-Staff').

This way, each local government was attributed 14 scores. Next, we calculated the mean scores of each factor of the 7Smodel for both the quadrant II as quadrant III organizations. These means were rescored on a total of 10 (instead of 2) for an easier interpretation. So we ended up with 7 mean scores for the organizational dimension and 7 mean scores for the technology dimension. This way,

we were able to compare the mean scores of the strong aligned organizations on the one hand with the weak aligned organizations on the other hand.

4. Alignment in practice

In this part of the paper, we elaborate on the local dynamics in both the strong or weak aligned organizations. Based on the summarizing figures of the mean scores of the organization and the technology dimensions we are able to explore the 7 elements and the dynamics between them for the two types of organizations.

4.1 Alignment from an organizational perspective

Looking at the radar below, we see that strong aligned organizations systematically score better than the weak aligned organizations. The most prominent contrast is reflected in the 'style' dimension and shows that strong aligned organizations score a lot better than the weak aligned organizations when considering their leaders and their leadership style. The 'systems' dimension reveals the lowest score for the weak aligned organizations and reflects the lack of attention for processes in weak aligned organizations. It is important to point out that these mean scores only give an indication of the difference between both types of organizations. They are the summary of the individual cases and stories of these organizations. So next, we discuss the 3 hard S's; strategy, structure and systems and the 4 soft S's; style, staff, skills & shared values for both types of organizations.

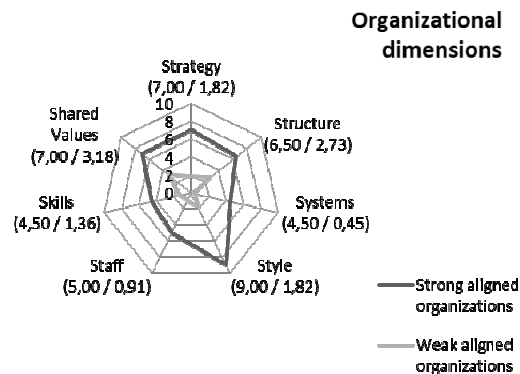


Figure 2: Mean scores of the 7S elements from an organizational perspective for both strong and weak aligned organizations

4.1.1 Strategy, structure and systems from an organizational perspective

Considering the structure of local governments in Flanders, they have a scope for policymaking and translating their policy to their organizational structure. We find that the strong aligned organizations have a well considered and in most cases written out vision and strategy that is supported throughout the organization. They have an ambitious policy plan that is generally developed after careful consideration of the input of both political as administrative leaders as well as based on the input of the executive staff. There is a broader strategy that is clear for the people involved. These ambitious goals are reflected in a well-considered organizational structure. They do not have strong hierarchical structures but in most cases they have recently been in the process of rethinking their organizational charts in order to group policy domains that are related. Since the 1st of January 2008 the creation of a management team is mandatory for all local governments in Flanders¹. In the strong aligned organizations we notice a considerable number of higher managers that steer the administration, and that are supported by the middle management. They make a thought-out distinction between line and staff services. Their line services focus on the provision of services for citizens and the staff services support other departments in their daily activities by providing the logistic framework. Both line and staff services are - at least partially - organized around the notion of processes, which are descriptions of the everyday operations and services. Strong aligned organizations realize the importance of thinking and organizing in terms of processes, are active in revising them and see it as a means to strive for a more effective and efficient organization.

¹ According to article 98 of the Municipal Decree states that *the management team supports the coordination of the different services in the preparation, implementation and evaluation of policy. The management team also monitors the uniform operation, the quality of the organization and the operation of the services, as well as internal communication* (Boudry et al 2009).

In contrast, weak aligned organizations are noticeably less ambitious when considering their strategy, structure and systems. They struggle in formulating a strategy and their expectations for the future. In most cases their strategic documents are developed by a limited number of people (influenced by the pressure of electoral ambitions), but this does not affect the daily functioning of the administrative organization. Day-to-day practices focus on the legislative role of the local government and the citizen-related services. In addition to the execution of these mandatory tasks there is little desire for formulating supplementary objectives. The organizational chart shows a rigid and mainly vertical structure with a limited number of managerial functions. In practice, department managers - and in some cases even the town managers - struggle with their managerial roles and sometimes even fall back on mainly executive tasks. They find it hard to think in terms of the organization as a whole and works towards a better and more efficient organization. The description and revision of processes is a real sticking point for weak aligned organizations. Most of them only have a limited number of process descriptions that have little effect on daily services, or have not started working on it yet.

4.1.2 Style, staff, skills & shared values from an organizational perspective

In addition to these rather formal and 'hard' elements, we also need to consider more 'soft' elements, such as style, staff, skills and shared values. The 'style' dimension stresses the role of managers and their style of leadership. This is reflected by the role of the town manager. The role of a town manager in a Flemish local government plays, as the head of the administration, a key role between the politics on one side and the administration on the other. In eight out of the ten strongly aligned organizations we perceive the town manager as a strong leader who can be described as an organization coach who has a vision for the organization. It is a manager who is open for change with good insights in the organizational strengths and weaknesses and who is able to question the function and goals of the organization as a local government. We notice that the management style of the town manager reflects on how the middle management is managing their departments, services and staff members. This management style stimulates a culture of openness and change, which can be considered as a basis for the shared values within an organization. This stimulates the staff in thinking out-of-the-box, or at least, to think further than their daily tasks and routines and to see convergences with what colleagues or people in other departments do. Both formal and informal consultations between staff members are based on trust and mutual respect. We see productive teamwork arising that breaks through boundaries between different departments. In terms of skills, staff member are no longer narrow-minded specialists but think in terms of services for citizens and how they can make the underlying processes more efficient and effective.

In the weak aligned organizations we also assessed the important role of the town manager as a leading actor. For example in the two local governments where there is an ad interim town manager. These organizations are characterized by a standstill where little to no new initiatives are initiated. This lack of leadership spreads over the rest of the organization. In the other organizations Boudry et al (2009) distinguish between two types of weak town managers. The first type does not take control over their organization but tend to fall back on executive tasks. They are not behind the wheel of their organization. The second type are leaders who are too directive; they give orders that stem from a strict legislative view of the organization. They keep a too firm grip on their organization and block bottom-up initiatives. This weak management style of the town manager spreads over to the middle management and the staff members. Most people within the organization hold to their own job and tasks and focus more on action rather than thinking. Joint initiatives between departments are rare and people are not concerned about their position within the organization as a whole. These organizations are very bureaucratic with invisible fences between departments aiming for consolidating rather than improving. The formal, one-way communication leaves little room for bottom-up ideas. The organizational culture is marked by a lack of trust and low flexibility. More ambitious people tend to leave their job in these kinds of organizations relatively quick.

4.2 Alignment from a technology perspective

When looking at the local governments from a technology perspective, the second radar also shows systematically better scores for the strong aligned organizations than for the weak aligned organizations. The dimensions 'strategy', 'structure', 'staff' and 'style' show a similar contrast between both types of organizations. When considering the hard dimensions, we find that the weak aligned organizations have no ICT policy, have a minimal ICT staff and show no attention to their ICT processes. What attracts our attention the most, is that there is quite a low contrast between the mean scores on the 'skills' dimension. So, strong aligned organizations still have a considerable number of

staff members that do not dispose of the necessary skills to use ICTs. Next, we discuss the 7 dimensions from a technology perspective.

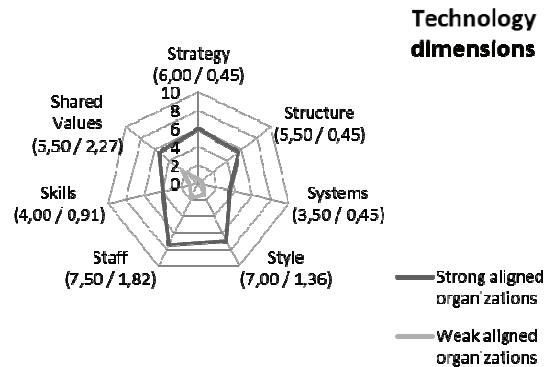


Figure 3: Mean scores of the 7S elements from a technology perspective for both strong and weak aligned organizations

4.2.1 Strategy, structure and systems from a technology perspective

The (absence of an) ICT-strategy gives a first idea of how an organization looks at ICT. Do they see it as something technological or as means for supporting and improving the organization as a whole? In all of the researched organizations the ICT-department is assigned with a supportive role. Even though, they differ in how they translate this into a particular strategy and organizational structure. We notice that the strong aligned organizations have a better idea of what this supporting role entails. They see ICT not as merely technical but as supporting for the organization as a whole. They think in terms of quality and efficiency and think about how they can deploy ICTs in striving for a better functioning organization. This attention for ICT is in most cases translated into an ICT-strategy that is written down in a separate ICT policy plan or is included in the general policy plan. This strategy affects the ICT-processes within the organization and very often this is not restricted to merely technological processes but it supports important organization wide processes. Next to strategy and systems, also the embedding of the ICT-department reflects how the organization looks at technology. In most strong aligned organizations the ICT-department is under authority of the town manager or is closely linked with domains such as internal affairs, communication, information, quality functions. This way, ICT is frequently discussed in the management team.

Weak aligned organizations have no or a very technical ICT-strategy. When ICT is mentioned in the organizations' policy plan, it reveals a very technical view that focuses on the functioning and maintenance of the hard- and software that is available and on the technical support of the staff members. The ICT-professional provides single solutions for individual requests. Generally, needs from staff members or departments that run parallel are not linked. As a consequence there do not result in a joint solution. ICT-processes are therefore limited to technical and supporting processes. The role of ICT in the organizational processes stems from the software applications the organization has acquired, but not from a consideration of the role ICT could play in vital organizational processes. If we consider the organizational chart, not all weak aligned organizations have an ICT-department (see below). If there is an ICT-department, its position within the organizational structure reflects a technical and functional interpretation. The classification under technical departments stresses the focus on automation and support. Subsequently, if ICT is discussed on the management or intermediate level, it is treated as something technical.

The ICT-market for local governments in Flanders is relatively small. Until recently there were only four major players but since a few years other ICT-suppliers started discovering the local governments as a new market for their products. There are two ways in how local governments deal with the ICT-market. There are local governments that have an active attitude towards the offerings on the ICT-market and consider different software solutions from different suppliers. They make a well-considered choice for the package that serves them with the best solution for their needs. In contrast, other governments show a much more passive attitude. They prefer buying software packages from one ICT-supplier, even though this supplier does not always offers the best solution for them. They are afraid that a new software package from a new supplier could conflict with their

existing packages. They have too little knowledge for dealing with compatibility problems while using software from different suppliers. This way, they are very dependent on what their suppliers offers them but also of the choices that were made in the past. Five out of the ten strong aligned organizations reflect an active attitude towards the ICT-market. Eight out of the eleven weak aligned organizations have a passive attitude towards the ICT-market and choose to work together with one ICT-supplier for buying soft-and hardware. The others are still searching how to align the offerings of the suppliers with their organizational needs.

4.2.2 Style, staff, skills & shared values from a technology perspective

The 'soft' elements reflect how ICTs are handled in reality. When we consider the ICT-staff, we find that the strong aligned organizations have ICT-departments consisting of a number of ICT-staff members ranging from 1 to 5, with an average of 2,8. Six of them dispose of an ICT-professional at level A². In contrast, four of the weak aligned organizations do not have a separate ICT-department nor an ICT-staff and level B is the maximum level in the weak aligned organizations. The average number of ICT-professionals is 0,6 with a maximum of 2. The four organizations without an ICT-professional there is at least one staff member that has a lot of interest in ICT and takes care of some basic technical interventions.

Not only the ICT-professionals leave their mark on how the organizations deals with ICTs. In agreement with the important role of the town manager on the organizational level, we also see a significant influence of the town manager on the vision on the role on technology within the organization. Boudry et al (2009) found that a town manager does not need to have a technical background to guide the technological growth of the organization. It is important for them to see new opportunities arise from ICTs and to be open for them. This came specifically to the fore in organizations where a new town manager was recently appointed, for example when the former town manager retired. There we saw a striking and positive change in how the organization looks at the opportunities that ICT holds for it. Where before there was an almost standstill in adopting new ICTs, suddenly the organization finds itself in a world full of new ICT challenges.

Next to staff and style, we also need to consider skills and shared values as interesting factors when we consider the use of ICTs by organizations. All researched organizations find significant differences in the ICT-skills of their staff members. Every local government seems to have staff members that have limited ICT-skills when using for example a word processing program or a spreadsheet. But they also have staff members who think along and show a proactive use of ICT in their job. When considering the 'shared values' or the organizational culture, we find that strong aligned organizations show a culture that is more open for technological changes than weak aligned organizations.

5. Conclusion

ICT-projects in local governments have currently limited success rates partly because of the lack of taking into account inter-organizational factors that encompass these projects. With this paper we want to stress the importance of investigating the internal dynamics of organizations dealing with ICTs. We applied the idea of alignment to local governments and explored the 7S model as a lens to examine case studies. By unraveling a range of factors that contribute to how organizations deal with ICT-driven change, we aim for a better understanding of the dynamic and ongoing process of aligning local governments with technology. This analysis of previous research findings is aimed as a first test to distinguish between different elements that help to explain how organizations deal with ICTs. So there is a need for more empirical research in a more structured and systematic way to identify and objectify these 'hard' and 'soft' elements that influences an organization's alignment level. We believe that the alignment level of local governments will also affect the level of succes of ICT-projects and thus has a considerable influence on how and to what extend ICTs are used within the organizations. Better insights in the complexity of this alignment process will thus lead to a more profound understanding of how this process comes into practice. At the local level, these new insights can contribute to a better understanding of internal processes that contribute to or hinder the implementation of new ICTs. This can lead to more awareness for a solid organizational basis of ICT-projects or a better performing strategic plan for managing ICTs and ICT-projects. At an aggregated level, the review of a series of organizations can form a good basis to develop a typology of how local governments deal with ICT-driven change. This will also be beneficial for ICT-suppliers or the higher

² Staff members working in Flemish local governments are employed in different levels, ranging from A to E, according to their educational level. Level A corresponds to a master's degree, level B to a bachelor's degree and so on.

government for supporting ICT-projects for local governments. In short, we stated that local governments differ notably in the way they make use of ICTs within their everyday functioning. The process of alignment is a complex and dynamic process that influences how local governments deal with ICT. This needs to be further examined in order to increase the understanding of how alignment comes into practice.

Acknowledgments

This paper is based on the results of the ICT alignment audits as part of the I-scan project. This project was executed from 2006 till 2009 in 29 local governments in Flanders and was a partnership between Corve (Flemish eGovernment Coordination Unit), VVSG (Association of Flemish cities and municipalities) and University College Ghent.

References

- Baets, W. (1996) "Some empirical evidence on IS Strategy Alignment in banking", *Information & Management*, 30, pp 155-177.
- Boudry, E., De Rynck, F., Janssens, S. and Rotthier, S. (2009) *EGovernment: nieuwe kans of nieuw probleem?* Bruges, Die Keure.
- Chan, Y. and Reich, B (2007) "IT alignment: what have we learned", *Journal of Information Technology*, 22, pp 297-315.
- Fedorowicz, J., Gelinis, U., Gogan, J. and Williams, C. (2009) "Strategic alignment of participant motivations in eGovernment collaborations: The Internet Payment Platform pilot.", *Government Information Quarterly*, Vol. 26, No. 1, pp 51-59.
- Henderson, J.C. and Venkatraman, N. (1993) "Strategic alignment: Leveraging information technology for transforming organizations", *IBM Systems journal*, 32, pp 472-484.
- Luftman, J. (2003) "Assessing It/Business Alignment", *Information Systems Management*, 20, pp 9-15.
- McKeen, J. and Smith, H (2003) *Making IT Happen: Critical Issues in IT Management*, Chichester, England, John Wiley & Sons Ltd.
- Meijer, A (2010) "Alignment 2.0: Strategic use of new internet technologies in government", *Government Information Quarterly*, Vol. 27, No. 2, pp 113-121.
- Rondinelli, D, Rosen, B. and Drori, I. (2001) "The struggle for strategic alignment in multinational corporations: Managing readjustment during global expansion." *European Management Journal*, 19, pp 404-416.
- Van Der Zee, J.T.M. and De Jong, B (1999) "Alignment is Not Enough: Integrating business and information technology management with the balanced business scoreboard", *Journal of Management Information Systems*, 16, pp 137-156.
- Waterman, R. Peters, T. and Philips, J (1980) "Structure is not organization", *Business Horizons*, Vol. 23, No. 3, pp 14-26.

Methodological Proposal for Evaluating the Usability of Sector Portals in a Multi-Level Government Environment

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Abstract: Attaining the goal of serving citizens more efficiently in a 2.0 eGovernment environment could require transition from institutional web sites that provide information regarding a specific organization to the activation of sector portals that provide complete information on an area as well as a wide range of services in which citizen participation is an indicator of success. The shift of attention towards the user in electronic services design has been reinforced by incorporating contributions to measure user satisfaction and especially to evaluate platform features that sustain the interaction of the user with the public administration. This study contributes to the exploration of new forms of evaluating portal functionality by informing on the method applied to the public health portals managed by the Spanish Autonomous (regional) Administrations in a multi-level environment that requires high interoperability. The proposed method, with conceptual bases and procedures applicable to other administrations and even other areas of intergovernmental administrative action, is inspired by usability studies carried out over the last 20 years. The unit of analysis is the network of portals an Autonomous Administration coordinates for health services. Suggestions are made for an approach that combines the various techniques (accessibility test, heuristic test, user test and mysterious e-user experiment), and indicators are proposed for evaluating features and services related to accessibility, usability, information, communication and services. In contrast with most other methods, which focus on applying a single technique - often the heuristic test - oriented towards the analysis of the most techno-centric usability parameters, the method proposed here instead combines various exploratory techniques and develops indicators based on the environmental characteristics of the sector portal. This method seeks to provide greater precision in findings and a description of web functionality that is better adjusted to public sector services and the specific nature of citizen interface.

Keywords: eGovernment; electronic services; portal functionality; multi-level government; usability; evaluation

1. Introduction

The benefits of eGovernment practices and their transformation of services are widely recognized in the scientific community and trans-national institutions (European Commission, 2002; OECD, 2005; UNDESA, 2010).

Mechanisms that facilitate internet interaction between citizens and administrations have advanced considerably over the last decade. These advances have helped to transform our understanding of the relations among the various actors involved in implementing public policies, especially concerning the provision of public services. Along with efforts to overcome traditional bureaucratic barriers and foster participation and democracy, there is a good deal of emphasis on attempting to meet user needs and expectations most efficiently while adjusting to budgetary constraints (Bertot and Jaeger, 2008; West, 2004).

However, criticism has increased regarding the design and implementation of online public services (Jaeger and Thompson, 2003; Reddick, 2005; Schedler and Summermatter, 2007). They are faulted for being excessively technocratic, primarily top-down, conditioned by the interests of the technology providers, excessively rhetorical in meeting user demands and weak in commitment to offering real and effective solutions to user problems (Anthopoulos, Siozos and Tsoukalas, 2007). There is a call for greater emphasis on the user (Verdegem and Verleye, 2009) in the design of eGovernment practices that encourage the collaborative involvement of final users and public employees (Anthopoulos, Siozos and Tsoukalas, 2007).

For a user-centered focus, more studies are needed to understand citizen demands and how users interact with public administrations. This necessary starting point would make it possible to identify potential service barriers that are generated in the design of systems that channel the user-administration relationship through the web. This kind of preliminary research would enable the more ambitious aim of providing services more efficiently and meeting public objectives more effectively in a context of greater inter-operability between the various organisms involved in public policies.

True success in implementing public policies is found in developing combined, coordinated and inter-operable action involving multiple organisms and from a perspective committed to the user. This article proposes a method for analyzing the functionality of a government portal and detecting design barriers to the range and provision of public services. The suggested methodology is the result of a research project for detecting barriers to eGovernment in an environment of intense inter-governmental relations. Though the study on which this proposal is based specifically analyzed regional or Autonomous Community (AC) public health services portals in Spain, its conceptual base and procedures are applicable to other territories and areas of inter-governmental administrative action.

2. Conceptual basis

The most extensively used definitions (UNDESA, 2010: 2; OECD, 2001) refer to *electronic government* as the intensive use of information and communication technologies (ICTs) to generate conditions for good government by providing services, transferring information efficiently and strengthening the implementation of public policies by creating new means of participation for the actors involved.

Although these and other definitions would include other optional technologies such as those based on mobile cell phone platforms, this study is limited to web-based services as the only non-presential intensively used channel for the provision of services (Vassilakis, Lepouras and Halatsis, 2007: 113). Recent statistics on internet use and connections with government services via the web substantiate this approach: around 98% of governments worldwide have institutional portals (UNDESA, 2010: 77); 65% of the European Union population (27 countries) regularly uses the internet at least once a week; 41% of the population has interacted with government administrations via government portals in the last year (Eurostat, 2011).

The degree of dialogue maintained with citizens and the information and services offered at public administration portals represent a milestone for the involvement of ICTs in the public sector. However, there are some inherent limitations to use of the web for providing information and services: part of the population cannot access the internet due to inadequate infrastructures, economic difficulties or lack of technical competence; information transfers are not always entirely secure and other cultural limitations or intra-organizational cognitive issues can inhibit the potential of eGovernment practices.

Though economic, organizational and educational efforts to support eGovernment are amply compensated and benefit the actors involved, in most countries technology greatly outpaces investment in the infrastructures required to develop ICTs, adequate citizen training and the political will needed to catalyze a true transformation of administrative processes. There is still a long way to go towards attaining a broad catalogue of online services and more open and transparent governmental practices supported by 2.0 technologies (Dunleavy and Margetts, 2006). Abundant examples can be found for government and public administration portals with capabilities that are clearly insufficient and far removed from the eGovernment-optimizing principles of openness, usability, personalization and transparency (Gant and Burley Gant, 2002).

The last twenty years of research on web usability have inspired the methodology proposed here. The unit of analysis is the network of portals that an intermediate administration (autonomic/regional) has available for a sectoral policy, the efficiency of which will depend jointly on the capabilities offered within its specific sphere and its inter-operability with other intermediate administrations in a system coordinated by Spain's central Administration.

Based on the idea of a governmental web portal as a single, integrated point of access (Granić, Mitrović and Marangunić, 2011: 339) for both external and internal users to official resources and services linked to an area of public service, this proposal begins by defining the key portal dimensions of accessibility, usability, electronic services, information and communication.

- *Accessibility* here will be defined according to Hassan and Martín (2003a) as “the possibility that a product or web service can be accessed and used by the largest possible number of people, without being affected by individual or contextual limitations”. The World Wide Web Consortium (W3C) and the Web Accessibility Initiative (WAI) consider a website accessible when it can be used by individuals with disabilities.

- *Usability* can be understood as the user's ease of interaction with the website in terms of ubiquity, design, efficiency, functionality and reliability. Hassan (2002) indicates that this concept is concerned with "designing websites so that the users can interact with them in the easiest, most comfortable and most intuitive way possible".
- In the context of eGovernment, *electronic services* can be defined as a set of capabilities derived from government actions and implemented by an entity through applications hosted by the respective websites in order to satisfy the needs of the actors concerned. Electronic eGovernment services fall into three general categories: government to government, government to citizens, and government to businesses (Wang and Liao, 2008: 718). The methodology proposed here deals with services intended for citizens.
- *Information* is understood as a set of open or restricted data that Public Administrations make available to users through a web page that addresses the various areas of action that are of public interest within its competency.
- Finally, *communication* is understood as a bi-directional relationship via the web that facilitates active user participation in public policies through cooperative formats such as debate, complaints or claims, consultation and suggestions, which allow for the alignment of administrative action with citizen expectations.

Although these concepts typically form part of usability analyses, particularly in the area of accessibility, we have considered it important to avoid the imprecision and informational lagoons that result from including all five concepts in a single analytical tool; which has been done almost without exception in the extensive scientific and professional literature on this topic. Here, usability has been ascribed a highly technical nature that involves meeting a series of design and navigation requirements. The other dimensions are examined individually and separately in order to highlight their contribution to the development of eGovernment.

3. Methodological basis and background

The procedure set forth here for analyzing the functionality of a sectoral government portal employs four techniques that are commonly used in scientific and professional communities:

- The *Automatic Accessibility Test* determines if the web page examined can be accessed by a wide range of users with different capabilities. Of the various applications available for automatically evaluating the adequacy of a web page based on the W3C *Web Content Accessibility Guidelines 1.0*, we selected the Web Accessibility Test (WAT) version 3.08, which has the option of testing web pages within the framework of the *Web Content Accessibility Guidelines 2.0*.
- The *Expert Test (Heuristic Test)* is concerned with technical usability, information, communication and service. In this diagnostic procedure, qualified personnel analyze the web page and describe its potential problems (Nielsen 1994; Dumas and Redish, 1999; Kruk, 2000; Hassan and Martin 2003b). Using a checklist, between two and five evaluators examine the web site for availability and performance according to several parameters, then compare observations, arrive at a consensus and provide a report on the results obtained.
- The *User Test* evaluates technical usability, information and service. It involves a group of volunteers who are given instructions to guide them through several interaction tests with the website. Any problems encountered in completing the tasks are recorded and can be compared and contrasted with the various technical parameters of the expert evaluation. The User Test offers data on the accessibility and quality of contents and procedures, specifically in the areas of information and service (Kuniavsky, 2003; Hassan and Martin 2004; Bangor, Kortum and Miller, 2009; Userfocus, 2010).
- The *Mystery E-user Test* is performed to obtain information regarding the communication dimension. Using a fictitious identity, several scenarios are designed by which interaction takes place with the website communication devices in order to qualitatively evaluate its response capacity to portal user needs and demands (Voss, 2000; Leuenberger, Schegg and Murphy, 2003; Matzler et al., 2005).

4. Procedure

As indicated in the introduction, these techniques were applied to a study of AC health service portals in Spain. The first step was to review all the specialized health service web pages, main portals and

websites of the departments responsible for health care services in the various AC Administrations. The result was a map locating health care content and services available on the official websites of the Autonomous Communities.

Significant differences were found among the AC Administrations with regard to information provided and the location of virtual service points (distribution of content, access level hierarchies, information and services). Therefore, the unit of analysis adopted was the network of web pages linked to the health services sector in each AC Administration, which presents an architectural archetype with four user access points: the main AC Administration portal, the sectoral department portal, the sectoral AC

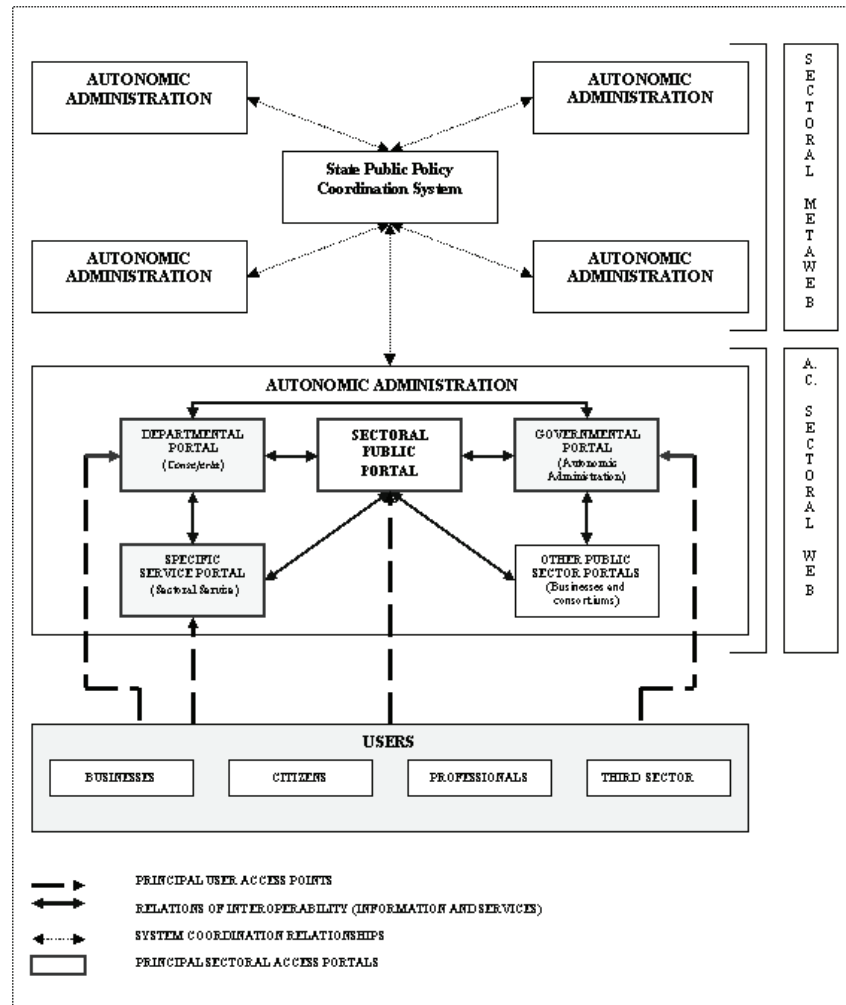


Figure 1: Archetypical structure for accessibility to a sectoral portal source: Author's own elaboration

Analyzing the sectoral AC websites (official portals providing information, communication and services in this area) is more involved and intense than examining a single portal, but it ensures full supervision of the entire eGovernment structure of a sectoral area and provides more thorough data on the various generators of information and services.

To make the analysis of the AC sectoral web operational, we began by examining the specialized health portal, followed by the health service portal of each AC Administration, the department (*Consejería*) portal that manages health care and finally the portal of the AC Administration itself. In this order, we examined each of the five key website dimensions, except that of technical usability, which focused exclusively on recognition of the sectoral portal as the main user access point (according to the AC Administrations). In order to achieve maximum homogeneity for comparison, if a specialized health service did not exist, the technical usability analysis was applied to the AC health services websites. When this was not possible, the test was applied to the AC departments, with the minimum criteria that the web page examined must offer at least two of the basic services available in the specialized portals of the other Autonomous Administrations.

For our analysis, we then adapted three of the four research techniques (expert test, user test, mystery e-user) to each dimension and level of analysis of health care policy. The contents of the health care meta-web for the entire system (all Autonomic Administrations) were examined in order to construct a model of the information offered, compile a catalogue of services and identify the communication channels geared to the citizen. A 'map' was then constructed to describe what was offered in the respective portals, the technological capacity available and implementation of the most extensively used global e-health care practices. Finally, although the intent of study was mainly to obtain a description of portal functionality levels and uncover elements blocking the development of eGovernment practices, in the final computation each dimension was weighted as follows in order to facilitate later classification in terms of quantity and quality: services (30%), communication (20%), information (20%), technical usability (15%) and accessibility (15%). In order to assign percentages for each of the dimensions and the parameters that some of them contain, the literature on indicators of e-services quality and usability was reviewed. After applying the Analytic Hierarchy Process for exogenous weighting (OECD-JRC, 2008), a proposal was made to a panel composed of 8 academic experts with a proven record of research on eGovernment practices and 8 technical experts working for government administrations, with experience in directing projects that incorporate ICTs into the public sector.

4.1 Accessibility test

As indicated, the Web Accessibility Test (WAT) version 3.08 (<http://www.tawdis.net>) was used to analyze the accessibility dimension and to ascertain the degree of adaptation of the web pages to the *W3C Web Content Accessibility Guidelines 1.0*. This was applied to the 'home-pages' of all the specialized AC sectoral portal URL's using the 'automatic mode' -problems detected are those confirmed as not meeting the guidelines by WAT 3.08 and therefore not requiring manual verification by the analyst- to the AC healthcare services portals, to the corresponding health or health care department portals and to the main portals of the Autonomic Administrations. An initial score of 100 points was assigned to each AC portal and then points were deducted according to the number of serious deficiencies (Priority 1) and moderate deficiencies (Priority 2) detected in the URLs analyzed. The final score reflects the obstacles to accessibility found in each AC web portal, regardless of the entry point.

In order to gain additional information and reveal parallels in the final scores, the WAT 3.08 analysis was complemented by a second analysis using the automatic WAT WCAG 2.0 beta version application, which examined the degree of web portal adaptation to the *Web Content Accessibility Guidelines 2.0*.

4.2 Expert test

Before applying the Expert Test, a pre-test was done on an Autonomic web site to determine the precision of the checklists designed for each key website dimension. Two analysts then conducted the actual Expert Test. In order to refine perceptions and verify correct interpretation of the criteria/scales, the joint heuristic analysis of technical usability and services was combined with an individual analysis and the results were later compared.

4.2.1 Technical usability

The heuristic checklist for technical usability covered five parameters:

- Searchability: the page analyzed should be visible to the user, provide a singular environment and occupy the best possible positions in search engine result lists. The reference search engine for the searchability test was Google (93.1% of the market share) (Search Engine Barometer, 2010)
- Identity: the page should provide sufficient information about the organization to which it belongs.
- Design-Style: website interface should be friendly and attractive for the user; the page should also have a coherent information structure and mechanisms to facilitate identification of the different kinds of information offered, according to its importance to the user.
-
- Navigability: the website should facilitate user navigation and access to content within the system. The user should be able to move around quickly without getting lost and have quality help tools available.

- **Security:** the page should guarantee the most confidential navigation experience possible, safeguarding with all legal guarantees the data generated during communication with the user and protecting the user from unauthorized use of that data by third parties.

Based on the W3C guidelines and the literature on technical usability, the following weight was assigned to each of the five parameters: searchability (15%); identity (8%); design-style (30%); navigability (35%) and security (12%). To gather information about these five parameters, 41 indicators were used with scales adjusted according to the availability of each element examined and the quality and performance of the mechanisms.

4.2.2 Information

To treat the information aspect, a checklist was compiled to ascertain the availability of certain contents. As applied to health services, it included information about institutions and the health services system; information listing services offered; information on programs or campaigns; information for the user on health education, pathologies and prevention; information on other entities linked to health care policies; information on other services. Using a scale inspired by prior studies (Eschenfelder and Millar, 2007; Charvet-Berard, Chopard and Perneger, 2008), 76 indicators were designed to evaluate the quality of information. The scale focuses on the availability of information, completeness, layout, and the inclusion of contact references.

4.2.3 Communication

Beyond guaranteeing communication with those managing the website, the portal should provide support for bi-directional communication, at least through the same channel as other services provided by the organism and the environment (actors concerned in the social context). Using three key parameters of 1) user support, 2) consultation and debate, 3) suggestions and complaints, we examined bi-directional communication mechanisms, especially those that provided synchronic communication with the user.

The analysis involved 11 indicators and the weight assigned to each parameter took into account the importance of each mechanism for serving the user as fully as possible with the available technology. Since these basic mechanisms are inherent to an institutional website focusing on communication with users, the 'user support' parameter was given greater weight (40%) than the others (30% each).

4.2.4 Service

Description of this aspect is based on a checklist defined by two parameters: services facilitating health care assistance and documentation services. Each of these parameters is evaluated with 25 indicators on a frequently-used 0-4 scale, where: 0 = services not offered; 1 = information is provided but requests cannot be processed; 2 = related documents can be downloaded but further processing must be done offline; 3 = the procedure requires both online and offline processing; 4 = the procedure can be fully executed online.

4.3 User test

After the main results were obtained from the Expert Test, two pre-tests were carried out and the User Test was designed and executed as follows:

- **Preliminary questionnaire:** included questions on user experiences (prior user experiences visiting similar portals, purpose, degree of success) and navigation expectations (tasks, information and services that inexperienced users hoped to find).
- **Preliminary Test 1:** this test involved the ubiquity/visibility of the portal and its identity within the sectoral AC website. The user was asked to find the webpage of interest using Google within a limited time period and the following were observed: process, options employed in the search, choices between different options and reactions to the visual display of each option.
- **Preliminary Test 2:** the portal under evaluation was examined by each participant. User impressions of the page were recorded, as well as expectations of what could be done with it, interest created by the page, comparisons with any other type of pages already visited and the choice of important elements.
- **Main tests:** eight tests were carried out related to services offered by the portal of interest and the information it provided.

- Comprehension of labels related to services / information offered, expectations regarding the content behind the label (2 tests).
- Access to and processing of a service request (2 tests).
- Ability to return to the home page (2 test).
- Access and evaluation of information (2 tests).
- *Complementary main tests questionnaire*: based on what the participant judged to be necessary content of a thematic sectoral portal, questions were asked regarding missing tasks, impressions of the portal visited, evaluation of its quality, an explanation of the interest/rejection it caused, aspects that created interest in the user, problems detected, useful elements for the theme addressed, reasons to recommend or not, and suggestions for improvement.
- *Post-navigation tests*: the participant responded to a closed questionnaire evaluating his or her degree of assent to several items related to how interesting the portal was, its design, ease of use, the need for help navigating it, tools, coherence between elements, capacity for generating user competence during the interaction, safety/security and complexity; in the second test, the participant was asked to choose and justify the choice of 5 descriptors from a total of 103 options related to the experience of navigating the portal of interest.

Four individuals were selected to evaluate each portal. Potential candidates were given a recruiting test designed to confirm and homogenize their competence profiles, experience and frequency of internet use.

4.4 Mystery e-user

This is the last technique in the methodology sequence applied to evaluate the quality of user support provided by the portal, from a real user perspective. Using the contact mechanism provided by the portal and false identities, five tasks were posed: finding information regarding a specific health matter, finding information regarding the procedure to be followed to access a service included in the online catalogue, finding information regarding the steps to be followed for an off-line service, finding information regarding access to personal data (kept by the administration) related to a specific health area when a citizen moves to another Autonomous Community, and filing a complaint/claim.

The indicators used for measuring the quality of attention were: the amount of time required for a response, the form of response, clarity of communication, quality of information provided, and how well the response fits the user's request.

5. Resources required for application

Based on the research carried out here, we estimate that the entire procedure can be applied in less than 5 weeks (not including the writing of reports). This would require at least two analysts sharing the workload of evaluating a sectoral web composed of 10 portals. With the exception of the user test, which logistically requires greater resources, the other techniques involve low financing, equipment and personnel costs.

6. Conclusions

This study offers a methodological proposal for analyzing the functionality of sectoral portals within the State online system for coordinating services and care in a specific area of public policy. The methodology is predominantly qualitative and was tested in the area of health care services.

Although the use of related techniques is frequent in the literature, the manner in which they are used and sequenced here provides a wealth of information. Moreover, the methodological design offers the novelty of being able to gather information on the functionality of a sectoral meta-web (network of networks providing services in a policy area) and user interaction with it by means of the sectoral webs of the public administrations involved.

The information potential resulting from this method is considerable, given the volume of data that the indicators offer regarding the technical aspects of the architecture of accessibility and usability, the quality and structure of information offered, the communication mechanisms involved and the degree of development and adaptation to the user in an eGovernment environment.

Phases of the Process	Activities	Week 1		Week 2		Week 3		Week 4		Weeks 5-6	
		t	Eq	t	Eq	t	Eq	t	Eq	t	Eq
Design	Seeking access points to the sectoral portal	12	B								
	Examining portals	15	B								
	Adaptation of techniques	10	B								
Accessibility	Application of accessibility test			6	B						
Heuristic Test	Application of usability test			8	B						
	Application of services test			8	B						
	Application of information test			20	B						
	Application of communication test			5	B						
User Test	Design of scenarios					5	B				
	Recruiting					5	B				
	Logistical testing					10	B+C				
	Application of user test					60	B+C				
Mystery User	Design of the experiment							8	B		
	Execution of the experiment							5	B		
Reports	Writing up reports									30	B

Figure 2: Equipment and time required for a comparative analysis of 10 portals (t: hours required for each activity; Eq: type of equipment required; B: basic office equipment and supplies for a minimum of 2 analysts; C: additional resources, such as facilities for the user test, support personnel and volunteers)

This procedure makes it possible to describe the progress being made in user-focused eGovernment practices in the sphere of public policy and can be utilized to detect barriers to the online provision of public services.

References

- Anthopoulos, L.G., Siozos, P. and Tsoukalas, I.A. (2007) "Applying participatory design and collaboration in digital public services for discovering and re-designing eGovernment services", *Government Information Quarterly* 24, 353–376.
- Bangor, A., Kortum, P. and Miller, J. (2009) "Determining what individual SUS scores mean: Adding an adjective rating scale", *Journal of Usability Studies*, 4 (3) 114–123.
- Charvet-Berard, A.I., Chopard, P. and Perneger, T.V. (2008) "Measuring quality of patient information documents with an expanded EQIP scale", *Patient Education and Counseling* 70, 407–411.
- European Commission (2002) "eEurope 2005: An information society for all", [online], <http://europa.eu.int/eeurope>. [Accessed on 2/7/11]
- European Commission (2004) "User satisfaction and usage survey of eGovernment services", [online], <http://europa.eu.int/eeurope> [Accessed on 2/7/11]
- European Commission (2010) "Smarter, Faster, Better eGovernment. 8th eGovernment Benchmark Measurement", [online], http://ec.europa.eu/information_society/eeurope/i2010/docs/benchmarking/egov_benchmark_2009.pdf [Accessed on 2/7/11]
- Dumas, J. and Redish, J.C. (1999) *Practical Guide to Usability Testing*. Exeter: Intellect Books.
- Dunleavy, P. and Margetts, H. (2006) "New public management is dead—Long live digital-era governance", *Journal of Public Administration Research and Theory*, 16(3), 467–494.
- Eschenfelder, K.R. and Miller, C.A. (2007) "Examining the role of Web site information in facilitating different citizen–government relationships: A case study of state Chronic Wasting Disease Web sites", *Government Information Quarterly* 24, 64–88.
- EUROSTAT (2011). http://epp.eurostat.ec.europa.eu/portal/page/portal/information_society/data/main_tables [Accessed on 2/7/11].
- Gant, J. P. and Burley Gant, D. (2002) "Web portal functionality and state government E-service". Proceedings of the 35th Hawaii international conference on system sciences. IEEE.
- Granić, A., Mitrović, I. and Marangunić, N. (2011) "Exploring the usability of web portals: A Croatian case study", *International Journal of Information Management* 31, 339–349.
- Hassan, Y. (2002) "Introducción a la Usabilidad", [online], http://www.nosolousabilidad.com/articulos/introduccion_usabilidad.htm [Accessed on 2/7/11].
- Hassan, Y. and Martín, F.J. (2003a) "Qué es la Accesibilidad Web", [online], <http://www.nosolousabilidad.com/articulos/accesibilidad.htm> [Accessed on 2/7/11].

- Hassan, Y. and Martín, F.J. (2003b) Guía de Evaluación Heurística de Sitios Web, [online], <http://www.nosolousabilidad.com/articulos/heuristica.htm> [Accessed on 2/7/11].
- Hassan, Y. and Martín, F.J. (2004) "Propuesta de Adaptación de la Metodología de Diseño Centrado en el Usuario para el Desarrollo de Sitios Web Accesibles", *Revista Española de Documentación Científica*, (27) 3.
- Kruk, S. (2000) *Don't Make me Think! A Common Sense Approach to Web Usability*. Indianapolis: Que Coop.
- Kuniavsky, M. (2003) *Observing the User Experience: A Practitioner's Guide to User Research*. San Francisco: Morgan Kaufmann Publishers.
- Jaeger, P. T. and Thompson, K. M. (2003) *EGovernment around the world: Lessons, challenges, and future directions*, *Government Information Quarterly*, 20(4), 389–394.
- Leuenberger, R., Schegg, R. and Murphy, J. (2003) "E-mail customer service by upscale international hotels", en A. J. Frew, M. Hitz y P. O'Connor (Eds.), *Information and Communication Technologies in Tourism*. Nueva York: Springer
- Matzler, K., Pechlaner, H., Abfalter, D. and Wolf, M. (2005) "Determinants of response to customer e-mail enquiries to hotels: evidence from Austria", *Tourism Management* 26, 249–259.
- Nielsen, J. (1994) *Heuristic Evaluation*, en J.Nielsen y R.L. Mack (Eds.), *Usability Inspection Methods*. Nueva York: John Wiley & Sons.
- Nielsen, J. (2003) "Usability 101: Introduction to Usability", [online], <http://www.useit.com/alertbox/20030825.html> [Accessed on 2/7/11].
- OECD (2001) *EGovernment: Analysis Framework and Methodology*. París: OECD Public Management Service, Public Management Committee.
- OECD. (2005) *EGovernment for better government*. Paris: OECD EGovernment Studies.
- OECD & Joint Research Centre (OECD-JRC) (2008) *Handbook on constructing composite indicators. Methodology and user guide*. Paris: OECD.
- Reddick, C. G. (2005) *Citizen interaction with EGovernment: From the streets to servers?* *Government Information Quarterly*, 22(1), 38–57.
- Schedler, K. and Summermatter, L. (2007) *Customer orientation in electronic government: Motives and effects*. *Government Information Quarterly*, 24(2), 291–311.
- Search Engine Barometer (2010). <http://es.atinternet.com/Recursos/Estudios/Barometro-buscadores/Search-Engine-Barometer-November-2010/index-1-2-6-215.aspx> [Accessed on 13/12/10].
- UNDESA (2010) *EGovernment Survey 2010. Leveraging eGovernment at a time of financial and economic crisis*. New York: United Nations.
- Userfocus (2010) "Usability Test Plan Toolkit", [online], <http://www.userfocus.co.uk/articles/testplan.html> [Accessed on 1/3/11]
- Vassilakis, C., Lepouras, G. and Halatsis, C. (2007) "A knowledge-based approach for developing multi-channel eGovernment services", *Electronic Commerce Research and Applications* 6, 113–124.
- Verdegem, P. and Verleye, G. (2009) "User-centered EGovernment in practice: A comprehensive model for measuring user satisfaction", *Government Information Quarterly* 26, 487–497.
- Voss, C. (2000) "Developing an e-service strategy" *Business Strategy Review*, 11(1), 21–33.
- Wang, Y-S. and Liao, Y-W (2008) "Assessing eGovernment systems success: A validation of the DeLone and McLean model of information systems success", *Government Information Quarterly* 25, 717–733
- West, D. M. (2004) "EGovernment and the transformation of service delivery and citizen attitudes", *Public Administration Review*, 64(1), 15–27.

The Role of Third-Party Reporting in Improving Tax Compliance in eCommerce

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Abstract: Tax non-compliance results in the loss of government revenue every year. Non-compliance in relation to eCommerce is a particular risk due to the anonymity of sellers, the absence of traditional audit trails and the difficulty experienced by taxing authorities in accessing transactional data. This presents traders with an increased opportunity to evade. The 'slippery slope' framework suggests that compliance is maximised when there is a balance between deterrence intervention types (Kirchler et al, 2008). Both the trust and power of authorities have an optimum, with diminishing marginal returns. Taxpayers should be given the opportunity to comply and only in the absence of a satisfactory response, should enforcement take place. This implies that if online trading cannot be effectively policed, leading to an absence of deterrence, compliance levels will fall even among otherwise compliant traders. Growing evidence shows that third-party reporting affects compliance behaviour because it is a visible deterrent, and it facilitates the detection of undeclared trading activity (Lyer et al., 2010). Currently, mandatory information reporting is limited to traditional financial intermediaries such as banks. However, in many online transactions using more novel sales platforms and payment methods, these intermediaries are absent. Newer intermediaries such as eBay and PayPal have taken their place in the transaction. This review paper initially analyses how third-party reporting from these newer sales and payment intermediaries is being used internationally by taxing authorities to increase the visibility of income and improve compliance. Having established best practice, we then examine the issues involved in introducing such third-party reporting in relation to eCommerce in Ireland. The advantages, disadvantages and obstacles to implementing such a system are discussed. The paper highlights the importance of effective tax information exchange between nations in an increasingly global economy.

Keywords: tax compliance, eCommerce, third-party reporting, information exchange, income visibility

1. Introduction

Rapidly developing technology will bring the value of electronic commerce (eCommerce) to an annual figure of almost €3 trillion by 2013, an annual growth rate of 19%, despite the global recession. The nature of eCommerce, its anonymity, double taxation issues, novel electronic payment methods, novel e-business models and jurisdictional issues, all make eCommerce difficult to tax effectively. This creates opportunities for non-compliance and tax evasion (Basu, 2007). Information on these transactions is not transparent or easily accessed by tax authorities, compounding the compliance issues.

Third-party information reporting is an alternative to expensive audit-based interventions to improve tax compliance and thus reduce the 'tax gap'. It is currently widely used in traditional transactions involving banks. In eCommerce transactions, however, banks are often replaced by intermediaries such as eBay and PayPal, from whom third-party reporting is not currently demanded in Ireland.

This paper reviews the use of third-party reporting from these newer intermediaries internationally and examines the barriers for its introduction in Ireland.

2. Methodology

This review paper begins by examining the literature on income tax compliance generally, and the role of third-party reporting in particular. The specific difficulties around taxation of eCommerce are examined focusing on the significance of third-party information from newer trading intermediaries. The use of such information by taxing authorities worldwide is reviewed, before the specific issues around its implementation in Ireland are examined. The paper concludes with a brief discussion on the role of international information exchange.

3. Theories of income tax compliance

Since most countries have a voluntary compliance tax system, much research has examined the motivations for compliance. In general, voluntary compliance depends upon taxpayers having trust in

the tax authorities. The alternative, enforced compliance depends upon the perceived power of the tax authorities to penalise evaders.

According to the standard economic analysis of tax compliance decisions, taxpayers calculate the difference between the gain from avoiding the tax and the cost of evasion if detected (Allingham and Sandmo, 1972). Taxpayers are viewed as '*perfectly moral, risk neutral or risk adverse, utility maximising individuals*' who choose to evade tax whenever the expected gain exceeds the costs (Milliron and Toy, 1988, p. 85). However, relatively high levels of overall tax compliance, despite audit and penalty rates being relatively low, suggests that forces other than utility maximisation are at work.

An alternate theory sees compliance as driven by social psychology: the social norms and social interactions for compliance (Andreoni *et al.*, 1998). Taxpayers, despite being able to cheat, are unwilling to do so for non-economic reasons. Perceived social norms for a social group and the acceptance or otherwise of non-compliance affect personal compliance (Wenzel, 2005). Taxpayers who believe that their peers are evading tax, are themselves more likely to evade. For eCommerce, the perception that Internet sales are not monitored or taxed may encourage non-compliance.

Income source is an important determinant of tax compliance. The level of visibility, probability of detection and perceived probability of detection have a strong effect on compliance behaviour (Bloomquist, 2003). Overall, '*evasion seems best explained by opportunity, including the low-perceived likelihood of detection and penalty, and by peer norms*' (Morse *et al.*, 2009, p 67).

Reviews of tax compliance research conclude that compliance is affected by the interaction of socio-economic and psychological variables, demographics (e.g. age, gender, education), non-compliance opportunities (e.g. income level, income source, occupation), attitudes and perceptions (e.g. peer influence, ethics, fairness) and tax system structure (e.g. complexity, probability of detection, penalties and tax rates) (Fischer *et al.*, 1992). The 'slippery slope' framework incorporates all these variables and suggests a balance between the types of deterrence interventions used to maximise compliance (Kirchler *et al.*, 2008). Taxpayers must trust the authorities, but also believe they have power to deter evasion. Trust and power interact. For example, overt displays of power can erode the trust needed to nurture compliance, while trust can lead to enhanced co-operation including whistle blowing, resulting in increased power and therefore greater compliance (Muehlbacher and Kirchler, 2010). The 'responsive regulation' approach is where a 'cooperative and persuasive approach' is the default. Enforcement strategies are used only in cases of continuous non-compliance. This has been recommended as the optimum method of attaining compliance (Braithwaite *et al.*, 2007).

3.1 Third-party reporting and tax compliance

Third-party reporting to tax authorities indirectly deters non-compliance, as it increases the visibility of income and reduces information asymmetry (Lyers *et al.*, 2010). Directly, the information it yields can be used as an audit tool and for enforcement. The use of third-party reporting and monitoring is highly effective; 94% of taxpayers pay tax on reported items of income (Lederman, 2007).

Overall, compliance levels decline not because taxpayers are *unwilling* to cheat but because they are *unable* to cheat due to the widespread use of third-party reporting (Kleven *et al.*, 2011). The ability to understate income is curtailed, increasing compliance. Visibility alone will not ensure tax compliance unless the information that is received by tax authorities is used as part of the verification/audit process; otherwise the perceived detection risk is lowered.

3.2 Taxation of eCommerce

ECommerce has revolutionised the way business is conducted by allowing traders and businesses to penetrate new markets that were previously inaccessible without a physical presence. Physical transactions have been replaced by electronic correspondence and payment methods, presenting non-compliance opportunities. A global recession has meant that all governments are eager to collect any tax due, so consequently they must address eCommerce non-compliance.

Tax laws are designed for businesses with a physical presence with fiscal boundaries in mind. They may not be adequate when applied to eCommerce, which occurs in the borderless, virtual world.

'Traditional businesses used to be like cows in a field waiting to be milked. Now the cows have wings' (Rees-Mogg, 1999).

Arguably, for a tax administration to be effective, it must be able to identify the taxable transaction, the person taxable, location of liability, amount due and ability to collect. Pinto (2005) highlights the difficulty in establishing the location of a transaction, when websites can be located offshore. eCommerce has resulted in disintermediation, wherein transactions can be completed without the need for a 'middleman' (O'Shea, 2010). This disintermediation has resulted in an important and effective audit trail being removed.

The anonymity of sellers and the lack of traditional audit trails used to identify and locate sellers present an opportunity for evasion and non-compliance. Income is difficult to detect and trace due to the use of non-traditional payment facilities. Traditional financial institutions are subject to reporting and withholding requirements and anti-fraud and anti-money laundering legislation, so financial information is accessible. This information is used both as a 'carrot and stick' for tax compliance and tax audit purposes due to the audit trail. With eCommerce, this audit trail is difficult to detect or can easily be disguised. In the absence of reliable transactional data, the traditional route is to 'follow the money'. With eCommerce, payment intermediaries are handling the money so tax authorities require access to this information.

The lower probability of detection of unreported income from eCommerce can lead to lower compliance rates (Bloomquist, 2003). The true extent of non-compliance by Internet traders is difficult to measure, as is the level of lost tax revenue. Anecdotal evidence suggests that compliance is low especially in small to medium sized eCommerce businesses. Larger, more established online businesses are more likely to be compliant due to their size, visibility and their reliance on good public relations. If non-compliance is not addressed, the whole tax system is undermined and it may lose its legitimacy. Non-compliance will become the social norm (Wenzel, 2005). This will be perceived as unfair and inequitable; honest taxpayers may lose trust in the tax system leading to greater non-compliance by previously compliant taxpayers.

3.3 New means of trading and payment methods

The growth of eCommerce has resulted in the emergence of auction sites and exchange websites. These sales platforms are difficult to police due to information asymmetry. Unless a trader voluntarily registers as a business, tax authorities may find it difficult to identify a trade or trader. E-bay, for example, connects buyers and sellers, and claims that 350,000 businesses in Europe use their services to sell goods, with approximately 94 million active consumer accounts on their global eCommerce platforms (eBay, 2011). Assessments on the level of eBay seller compliance in the U.S. found that overall compliance is low especially by smaller sellers (Alm and Melnik, 2011).

Alternative micropayment systems and electronic cash systems have evolved as a result of eCommerce. Electronic payments can be in the form of electronic cash, smart cards, electronic cheques and credit cards. The use of unaccounted, anonymous forms of electronic payments could lead to lack of controls associated with the cash economy and non-compliance (Basu, 2007). The use of electronic payment systems where there is a potential audit trail also poses a risk, if the account information cannot be accessed by tax authorities.

PayPal is the most successful electronic payment system to emerge with 150 million users worldwide (PayPal, 2011). With this type of micropayment system, an individual receives payment to a credit card or a bank account. In the meantime, funds can accumulate in their PayPal account or be used to make payments. There is the potential that they can be used to carry on a trade 'under the radar' of tax officials.

PayPal transactions are not anonymous, PayPal monitor and record these transactions and collect vast amounts of information regarding those receiving payments. In Europe, PayPal is licensed as a bank in Luxembourg as opposed to a payment intermediary as it is in the U.S. It is subject to the same regulations as other banks in relation to disclosure and reporting. However, transactional data is not readily accessible to the tax authorities outside Luxembourg; information must be requested on a case-by-case basis due to bank secrecy laws.

3.4 Third-party reporting and eCommerce

Third-party reporting to revenue bodies results in very high levels of voluntary compliance. Additionally, technological advances mean that it is now quicker to collect, process and store information. If this is the case, the question arises why the use of third-party information reporting is not more widespread? The expansion of information return issuance should not be arbitrary. It is suitable when certain criteria are met. Firstly, there should be economies of scale, when the information return compiler is better able to collect and process information than tax administrators. Secondly, there should be information asymmetry, when this party is in a position to understand the tax implications of transactions and thus alert the taxpayers of these implications. Thirdly, information reporting should only be applied to businesses where there is low compliance, thus making it suitable for application to eCommerce where compliance is anecdotally low.

Payment intermediaries and online trading platforms meet many of the criteria for information return issuance. They have computer systems that are capable of monitoring the relevant information. They are also in a position to notify businesses if their trading activity meets the criteria for information reporting to the tax authorities (Soled, 2008). Ironically, the technology used to facilitate non-compliance could be used to make non-compliance more difficult.

Imposing reporting obligations on payment intermediaries and online sales platforms recreates the missing intermediary and re-establishes the audit trail. Non-compliance opportunities relating to income level and income source are minimised and the probability of detection is increased, resulting in increased compliance. The awareness that income reporting information is made available to tax authorities may induce compliance to file reliable and accurate returns (Montano, 2010).

4. The use of information reporting internationally

A number of countries have introduced third-party return requirements as a means of encouraging compliance and reducing opportunities for non-compliance. The extent of the international application of third-party reporting is discussed below:

4.1 U.S.A.

In the U.S., Section 650W of the Housing Assistance Tax Act of 2008 provides for information reporting requirements from payment settlement entities and third-party settlement organisations from January 1st 2011. Other 'payment settlement services' including online auctions (e.g. eBay) and 'third-party payment networks' such as online payment systems (e.g. PayPal), are also subject to the reporting requirements. A threshold level of reporting applies, a '*de minimis*' exception applies where the aggregate payment to each payee does not exceed \$20,000 or the aggregate number of transactions for each payee does not exceed 200. Information reporting penalties and a backup withholding rate of 28% are applicable if payers to whom the legislation applies do not comply with reporting obligations. Details to be provided include the name, address, tax identification number and the gross amount of payments received by payees. The Inland Revenue Service (IRS) expects to raise approximately \$9.5 billion in tax revenue over ten years through the implementation of these reporting requirements.

4.2 Australia

In Australia, the Australian Tax Office (ATO) obtained data from eBay Australia and Trading Post Australia to assess the level of taxation compliance for individuals and businesses that sell goods and services online for the three financial years up to 2010 (ATO, 2010). This data was used to identify those selling goods and services greater than Aus \$20,000. This information was electronically matched with their data to identify those who are non-compliant in terms of their registration and reporting requirements.

This project resulted in 2,200 sellers being identified as underreporting sales figures, with 235 sellers underreporting by over Aus \$100,000 in 2009. As a result of this project, over 2,000 audits and reviews were carried out to address potential underreporting by eBay sellers. The information collected was used as part of the audit/verification process to increase the perceived detection risk.

4.3 Canada

In 2009, following a lengthy court battle, the Canadian Revenue Agency (CRA) succeeded in accessing information about Powersellers from eBay Canada. It obtained details of eBay sellers who met certain sales criteria, sales of over \$24,000 or at least 24 sales transactions in 2006, 2007 or 2008. eBay notified sellers prior to providing the information to the CRA. The CRA initiated a voluntary disclosure program to allow taxpayers an opportunity to become compliant before audit or enforcement options were implemented. Once again, the aim of the regime was to increase the visibility of income and was in line with the 'responsive regulation' approach.

4.4 Other countries

Although, third-party reporting in relation to eCommerce is limited, its application in addressing non-compliance is expanding. In Denmark, Estonia, Finland, Iceland, Norway, Sweden Chile and Spain, third-party information is made available to taxpayers before they file their returns, using pre-populated tax returns.

4.5 What is being done in Ireland?

eCommerce has grown in Ireland, this growth is largely attributed to the increased access to broadband, the growth of mobile Internet and the inability of traditional brick and mortar retailers to compete with online traders. This growth has been accompanied by the need for the Revenue Commissioners in Ireland to address non-compliance issues associated with eCommerce. Methods currently used to address non-compliance related to eCommerce are predominantly audit based (O'Shea, 2010), methods that are expensive in terms of manpower and are not wholly reliable.

An alternative approach to audit intervention and one that is more consistent with a voluntary compliance system would be the introduction of a system of information reporting by third parties who act as intermediaries for eCommerce purposes.

5. The practical difficulties of implementing third-party reporting requirements

The introduction of a system of third-party reporting in Ireland would not be straightforward. There would be a number of obstacles relating to the practicality of accessing, sharing and utilising transactional and trader information that would first need to be addressed:

5.1 Privacy

The access and use of third-party information is often discussed in terms of taxpayers' right to information privacy; the right for them to decide when, how and what level of information about them is communicated to others. The right to privacy should be regarded as a political right and ought to be respected. At the same time, there is the need to balance the right to information and the right to privacy.

Data privacy laws in different countries vary considerably. In the EU, the Data Privacy Directive (Directive 95/46/EC) provides very stringent rules for how data is processed and shared. Article 35 of the Directive provides that personal information can only be transferred across borders if the country has equivalent privacy protection laws and policies. This may result in difficulties sharing taxpayer's information with other countries. Many of the worries related to data privacy could be allayed by assurances related to data security.

5.2 Jurisdictional issues

The global nature of eCommerce means that on-line transactions may involve multiple jurisdictions. As a result jurisdiction to tax becomes an issue. Jurisdiction to tax is broken down into 2 elements, 'substantive jurisdiction' and 'enforcement jurisdiction'. Substantive jurisdiction is the power to impose a tax whereas enforcement jurisdiction is the power of a state to compel tax collection or compliance with domestic tax law. Countries differ in their basis for taxation. Some countries such as Ireland use the residence basis while others use the territorial basis. In the event of disagreement over substantive jurisdiction, double taxation treaties allocate taxing rights if there is a 'permanent establishment'. In the realm of eCommerce where the use of servers and cloud computing are commonplace, the identification of a permanent establishment becomes difficult. While the double taxation treaties allocate the taxing rights of identified profits to respective nations, the issue of

information exchange and enforcement jurisdictional rights remain a predominantly sovereign right (Hellerstein, 2003).

Where substantive jurisdiction is established, the lack of enforcement jurisdiction may make it difficult to enforce tax collection or compliance with reporting regulations on foreign payment intermediaries operating in Ireland. Tax authorities '*lack the power to compel foreign third parties to provide extraterritorial tax information*' (Dean, 2008). Without mutual assistance between international tax authorities, there is no effective means to ensure tax compliance, no means of compelling them to comply with reporting or withholding obligations.

5.3 Exchange of information

The OECD has identified '*the lack of effective exchange of information*' as a key aspect in determining harmful tax practices. The OECD has identified circumstances where there should be a spontaneous exchange of information between tax officials in different countries. Two of these grounds are:

- Suspecting that there may be a significant loss of tax in another country;
- Payments made to residents of another country where there is suspicion that they have not been reported.

While most bilateral treaties provide for tax information exchange (TIE) on request, few situations provide for the spontaneous exchange of information. One of the most notable exceptions is the European Union Savings Directive (Council Directive 2003/48/EC) where there is a multilateral agreement to automatically exchange information. This directive was met with a large amount of resistance from countries with strict bank secrecy laws. Austria, Belgium and Luxembourg (the base for PayPal) were granted an exception from the reporting requirements. Switzerland and Lichtenstein have signed bilateral agreements to exchange information on request but remain vehemently opposed to the automatic exchange of information. The issue of anonymity of person and location of trade means that tax authorities are often unaware that there is a tax risk so will not be in a position to seek the information through the mutual assistance programs.

5.4 Access to information

'The key to effective taxation is information, and the key to information in the modern economy is the corporation' (Bird, 1996). If this is the case, why is the use of third-party information reporting by large organisations such as eBay and PayPal not more widespread?

It is not always easy to access information from corporations, eBay only disclose personal information on traders in response to legal requirements. There is no automatic exchange of information. Cloud computing has made accessing transactional and financial information more difficult, data is being stored offsite, often in a different country. There are jurisdictional issues related to accessing third-party information that is located in a '*cloud*'. Privacy and confidentiality laws of the country where the computer is located may be applicable to the information as opposed to the laws where the third-party is based, making information difficult to access.

5.5 Nature of information

Third-party information is only useful if it is reliable and properly structured to the needs of tax authorities. Without this the usefulness of the information received may be contested and there is the risk of 'information overload'.

Information technology can be used to target particular interest groups at risk of non-compliance rather than a blanket surveillance system of monitoring Internet transactions. The data collected can be viewed as a means of providing protection to compliant taxpayers rather than as a means of repression. A transparent system where there are clear indications of the level of data being collected and how it is being used, creates trust and manifests itself in increased power for Revenue (Kirchler *et al.*, 2008). Conversely, an arbitrary system of data collection may result in compliant taxpayers feeling repressed resulting in a mistrust of the tax system (Wenzel, 2005). Thus, a targeted system of data collection has the optimum effect on voluntary compliance.

5.6 International co-operation

Whereas, eCommerce is highly internationalised, taxation has traditionally been considered a domestic matter. As eCommerce becomes more embedded, effective taxation requires greater international co-operation.

It has been suggested that a multilateral convention on taxation or an international consortium will need to be set up to collect taxes. Given that most countries would be unwilling to give up their sovereignty in relation to taxation, such a system is unlikely in the near future. What is clear is that international co-operation is required to tackle a global taxation issue (McNair *et al.*, 2009). A multilateral approach rather than a bilateral approach is required especially with cloud computing becoming so prevalent. At the very least, a system of information exchange between international tax authorities is required for effective policing of eCommerce compliance.

Co-operation is also required in situations where substantive jurisdiction has been established but where enforcement jurisdiction is difficult to apply. Revenue officials in one country do not have enforcement powers in another. Any enforcement of liabilities depends upon international co-operation to ensure that third parties located in a different jurisdiction comply with domestic information reporting regulations, and to enforce penalties, if necessary.

5.7 Opposition by third parties

ECommerce third parties argue that imposing reporting requirements on them decreases seller activity and harms their business. They say that they would need to develop the technology to track and compile information on sellers. The reality is that much of this data is already being tracked, monitored and compiled as can be seen by the categorising of sellers. Higher 'Powerseller' levels are given according to monthly turnover requirements (eBay, 2011). Given that Bird (1996) stated that *'the corporation is the information goose that produces the fiscal golden egg'*. The dilemma with regard to tax policy is *'how large an egg can be extracted without resulting in a decline and perhaps damage of the goose?'*

5.8 Administrative cost to revenue

Another concern is that information reporting would result in additional administrative burdens and additional costs for revenue officials. With the increasing number of returns being filed electronically, there is the propensity to process information electronically rather than manually so costs should actually be reduced and will mainly relate to enforcement rather than processing. An information reporting program with threshold levels of reporting should mean enforcement costs are lower, as they will be focused rather than arbitrary.

5.9 Political will

Ireland is marketing itself internationally as a knowledge-based economy where high valued knowledge-based activities should base themselves. It is already the European headquarters for eBay and PayPal. Tax is a critical differentiating factor for the location of hubs of such activities. One of the selling points for inward investment is ease of tax compliance, including the time and administrative efforts required to comply with tax regulation requirements. Implementing a system of information reporting adds an administrative burden on businesses and may decrease the competitiveness of business in Ireland.

6. Summary

It is suggested that governments are losing millions in tax revenue as a result of eCommerce non-compliance. The challenges that face tax authorities are the anonymity of identity and location of parties, anonymity of transactions, disintermediation, novel payment methods, identification of taxing jurisdictions, recovery of tax and exchange of information. Instead of being a tool for non-compliance, the technology used can be used to improve tax compliance. Audit trails that are absent through the use of eCommerce, can be recreated through the collection of transactional information from the intermediaries used in eCommerce.

Implementing a system of information reporting to include merchant providers and sales intermediaries involved in eCommerce would recreate the intermediary and the audit trail, making

income derived from eCommerce more visible. Perceived detection risk would increase, having a positive effect on voluntary compliance and reduce the reliance on audit techniques. The information received could also be used to identify jurisdiction, establish liability and can be used as a means of enforcement.

A 'de minimis' level third-party reporting system similar to that in the U.S., means that only relevant and pertinent information is received. This reduces the administrative burden on both the supplier of the information and the tax administrations. This also prevents the 'Big Brother' scenario, and would protect the trust/power relationship between all taxpayers and have a positive effect on the 'slippery slope framework' (Kirchler, 2008), where citizens can lose trust in a system that has excessive power. Information received from third parties that indicates that a taxpayer is liable to tax from eCommerce business should be communicated to them. They should be offered the opportunity to comply, and only in the absence of a satisfactory response, should enforcement take place (Leviner, 2005). Such a system is likely to be perceived as the most procedurally fair and have the greatest impact on overall voluntary compliance. In this way, indirectly, both the social and the subjective norm for compliance by e-traders could be altered from a scenario of non-compliance to compliance.

ECOMMERCE is global, multiple jurisdictions are involved, and so some level of multijurisdictional co-operation is required to fully address eCommerce non-compliance. The automatic exchange between nations would have the greatest impact on compliance.

Any positive effect on compliance due to the introduction of information reporting would also have a significant effect on the 'tax gap'. Meanwhile, any failure to address eCommerce non-compliance could lead to further non-compliance and even greater loss of revenue.

References

- Allingham, M., G. and Sandmo, A. (1972) 'Income tax evasion: A theoretical analysis', *Journal of Public Economics*, vol.1, pp. 323-338.
- Alm, J. and Melnik, M. I. (2011) 'Do eBay sellers comply with state sales taxes?', Tulane University, Department of Economics, *Working Paper*, No. 1106.
- Andreoni, J., Erand, B. and Feinstein, J. (1998) 'Tax compliance', *Journal of Economic Literature*, 16, 818-860.
- Australia Tax Office (2010) 'Online Selling Data Matching' [online], Australia Taxation Office, Australian Government, <http://www.ato.gov.au/content/00250217.htm>
- Basu, S. (2007) 'Global Perspectives on ECommerce Taxation Laws', Aldershot, UK: Ashgate.
- Bird, R. M. (1996) 'Why tax corporations?', International Centre for Tax Studies, University of Toronto, December 1996, Working Paper, 96-2.
- Bloomquist, K. M. (2003) 'Income inequality and tax evasion: A synthesis', *OECD Papers*, 3 (10), 1-25.
- Braithwaite, V., Murphy, K. and Reinhart, M. (2007) 'Taxation threat, motivational postures and responsive regulation', *Law and Policy*, 29, 137-158.
- Case Law *EBay Canada Limited et al v MNR* 2008 FCA 348
- Dean, S. A. (2008) 'The incomplete market for global tax information', *Boston College Law Review*, 49 (3), 605-672.
- eBay (2011) 'Who we are-eBay Inc' [online], http://www.ebayinc.com/who_
- Fischer, C., Wartick, M. and Mark, M. (1992) 'Detection probability and taxpayer compliance: A literature review', *Journal of Accounting Literature*, 11 (1), 1-46.
- Hellerstein, W. (2003) 'Jurisdiction to tax income and consumption in the new economy: A theoretical and comparative perspective' (2003). *Scholarly Works*. Paper 124. http://digitalcommons.law.uga.edu/fac_artchop/124
- Kirchler, E., Hoelzl, E. and Wahl, I. (2008), 'Enforced versus voluntary tax compliance: the "slippery slope" framework', *Journal of Economic Psychology*, 29 (2), 210-225.
- Kleven, H.J., Knudsen, M., Thustrup Kreiner, C., Pedersen, S., and Saez, E., (2010). 'Unwilling or unable to Cheat? Evidence from a randomized tax audit experiment in Denmark', *NBER Working Paper*, Series No. 15769.
- Lederman, L. (2007) 'Statutory speed bumps: The roles third parties play in tax compliance', 60 *Stanford Law Review*, 60, 695. Indiana Legal Studies Research Paper No. 78.
- Leviner, S. (2005) 'A new era of tax enforcement: The 'Big Stick' to responsive regulation', *University of Michigan Journal of Law Reform*, 42 (2), 381-429.
- Lyer, G. S., Reckers, P. and Sanders, D. (2010) 'Increasing tax compliance in Washington state: A field experiment', *National Tax Journal*, 63 (1), 7-32.
- McNair, D., Killian, S., Collison, M., Bradshaw, F. and Cumming, M. (2009) 'Tax Justice: The Impact of Global Tax Policy on Developing Countries and the Role Ireland Can Play', *Trocaire Development Review*, Dublin, 2009, pp 77-96.
- Milliron, V.C. and Toy, D.R. (1988) 'Tax compliance an investigation of key features', *Journal of American Taxation Association*, 10 (85), 84-104.

- Montano, M. P. (2010). "Can widening the scope of information reporting to include income derived from online sales help to narrow the expanding tax gap?", 83 *Southern California Law Review* 379.
- Morse, S. C., Karlinsky, S. and Bankman, J. (2009) 'Cash businesses and tax evasion', *Stanford Law and Policy Review*, 20 (1), 37- 68.
- Muehlbacher, S. and Kirchler, E. (2010) 'Tax compliance by trust and power of authorities', *International Economic Journal*, 24 (4), 607-610.
- O'Shea, J. (2010) 'Compliance and audit issues arising from eCommerce in Ireland', *International Journal of e-Business Management*, 4 (2), 52-62.
- Paypal (2011) 'Access User Base', <https://www.paypal.com/ie/cgi-bin/webscr?cmd=xpt/Marketing/bizui/AccessUserBase-outside>.
- Pinto, D. (2005) 'The ten issues relating to conducting business in cyberspace' [online] *Journal of Internet Banking and Commerce*, 10 (1). Available: <http://www.arraydev.com/commerce/jibc/2005-02/Dale.htm>
- Rees-Mogg, W. (1999) "A World of City States," *National Post* (March 5, 1999), p.18.
- Soled, J. (2008) 'Homage to information returns', *Virginia Law Review*, 27, 371-397.
- Wenzel, M. (2005) 'Motivation or rationalisation? Causal relations between ethics, norms and tax compliance', Centre for Tax System Integrity, Research School of Social Sciences, Australian National University, *Working Paper*. No.63.

The Rule of e-law

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Abstract: One of the most cherished ideals in international debate in the field of law and legal theory is the rule of law. This concept has traditionally been associated with both democratic values and the legal maxim stating that no person is above the law. In other words, the rule of law involves that judicial, legislative and executive powers—and its officials and agents—must be accountable under the law, which must be clear, publicized, stable, fair, and must protect fundamental rights. In this paper the author sketched out some of the most crucial and strategic topics concerning the rule of law and its current transformations. Specifically, in the last years we have seen how Information and Communication Technologies (ICTs, hereinafter) could help us improve the rule of law effectiveness. Internet and web 2.0 are changing both the way in which citizens exercise sovereignty and the manner to participate in public and civic affairs. In the first field, we will observe that new technologies are fragmenting physical and conceptual borders amongst states, and will study the impact of ICTs on the notion of national sovereignty, which is constantly changing. Secondly, the author describes how technology creates new spaces 2.0 in which citizens can have access to public information, participate and collaborate in civic life issues. To be precise ICTs ensure the public trust and establish a system of transparency, public participation, and collaboration, not only by the way of control government, but also to give the people an opportunity to take part in the formation of law. A new paradigm of the manner to exercise sovereignty and participate in public affairs comes from Iceland. The Constitutional Council of Iceland has been working on the new constitution for a while and has been attracting some positive attention due to the openness and inclusiveness of its workings, and its use of ICTs to include the general public. We then will note how the public's participation takes up an important role in the work process to reform the Constitution of Iceland, which even allow people to leave their comments and suggestions both on the process and the content of the new constitution itself in the most popular social networks as *Facebook*, *Twitter* or *YouTube*. Finally, the author draws the principal's conclusions from an Iceland laboratory with regard to use of ICTs to improve citizen's empowerment by participating in the development of laws and deliberating a new Constitution.

Keywords: rule of law, open Government, e-Participation, deliberative democracy, ICTs, citizenship empowerment

1. Introduction: Sketching out rule of law meaning in constitutional democracies

All constitutions of democratic constitutional states enshrine the rule of law as an ideal that legitimate the system and the exercise of powers. Normally this ideal has been connected with universal most appreciated principles that may interact with each other in multiple ways and include, but are not limited to: a system of balancing of powers, the accountability and subjection of these under the law, which must be clear, publicized, stable and fair, and the fact that powers derive from the constitution which indeed translate the will of people, who are sovereign. Thus we can define the rule of law as the ideal that pretends that 'any exercise of power must be interpretable as emanating from a constitutional provision' (De Hert and Gutwirth, 2006: 65). This implies the subjection of government and other state powers to a set of restricting constitutional rules and mechanisms (Chevallier, 1994), to protect the individuals against excessive and arbitrary domination. Nevertheless, the theory does not always match reality on the ground. Some recent studies have tried to offer a detailed and comprehensive picture of the extent to which countries adhere to the rule of law in practice (Agrast, Botero and Ponce, 2011), studying nine factors or dimensions of the rule of law: limited government powers, absence of corruption, order and security, fundamental rights, open government, effective regulatory enforcement, access to civil justice, effective criminal justice and informal justice. But, can ICTs help us improve the effectiveness of the rule of law in practice? In this paper we will map out some topics in which ICTs are giving a new practical extension of the rule of law: e-transparency, e-accountability, e-participation and e-sovereignty.

2. Towards a virtual sovereignty?

As we have pointed out *infra*, in constitutional democracies all powers must derive from the constitution, which translate the will of sovereign people. We must remember that the rule of law implies that law appears as the command of the sovereign people (Hobbes, 1996). Precisely with the will or consent of the people the democratic State reaches legitimacy. The ultimate powers in a society, therefore, rest in the people themselves, and they should exercise those powers, either directly or through representatives, in every way they are competent and that is practicable. This is

clearly expressed in some inspirational words of Benjamin Franklin, one of the founding fathers of United States of America, who said: 'in free governments, the rulers are the servants, and the people their superiors and sovereigns' (Jefferson, n.d.). In a similar vein Thomas Paine said 'I am a Citizen of a Country which knows no other Majesty than that of the People [...] no other Sovereignty than that of the Laws' (Paine, 1995: 376). However, these assertions have never been carried in practice, largely because of the difficulties in involving citizens in managing public affairs, and the opacity of powers which precludes an effective control of these. Participation of citizens has traditionally been performed through periodic democratic elections —representative democracy— and the accountability of the powers by a public opinion that has long been a reflection only of those who have power (Habermas, 1994: 102). But now, ICTs bring up an opportunity to increase the participation of the citizens in public affairs and improve transparency by the way of requiring powers accountability, at the same time in which the States started losing their sovereignty and the notion of nation became in crisis. Internet and new technologies calls for a rethinking of the notion of sovereignty facing a territorial —global— debate (1) and understanding the new way in which sovereignty may be exercised by citizenship (2).

2.1 The end of physical and conceptual borders amongst states

Normally the notion of sovereignty has been understood as it belongs to and derives either from the nation or from the people, nonetheless both abstract entities have been usually linked to a physical territory and its past, present, and future citizens. This definition made sense in a world separated by physical and conceptual borders. The firsts because the States exercise of sovereignty cannot harm other nations, so it creates limits in portions of land, water and air. The seconds are connected to the ideal of historical and cultural nation, that's the citizens feeling to be part of a collective superior body —nation—. However, technology has deteriorated both borders, on the one hand, by facilitating the physical movement of people across the world; on the other hand, by allowing global and real-time communications which means break historical and conceptual barriers. At the same time, nonetheless, we note the contradictory signs of the attachment of people to the concept of nation-state, confirmed by recent events that are seeking independence —e.g. the case of Kosovo and other states of ex-Yugoslavia— and negative reactions to developments in several countries of the European construction —the French and Dutch negative answer to European Constitution in 2005, and Irish negative vote at the 2008 referendum—. But the truth is that the development of economic, political, social and cultural rights has acquired in recent decades a dimension that rises above the borders amongst states and ignores the administrative and political divisions that have been established amongst the people. This phenomenon is a consequence of globalization, which reflects the modification of space-time coordinates of state action, forcing the reformulation of some state functions (Lopez, 1999: 7-20). As we have pointed out *infra*, it is also a consequence of the technological revolution. At the same time, the fact that states lose their sovereignty means also a crisis of the principle of strict legality, produced by 'the dislocation of legal sources outside borders and the ensuing weakening of the guarantees provided by national constitutions' (Ferrajoli, 2007: 344). Thus the future of the constitutional state seems to be constitutionalism with no state, with both global and virtual sovereignty. Some important voices claim for a global constitutionalism (Ferrajoli, 1998), in which the idea of virtual sovereignty could work. Virtual sovereignty would be a kind of metaphor for imagining a normative exercise overall which would attach to the territory, by allowing coexistence, complementarity and consistency of a plurality of legal systems that come from in or out of the state (Benyekhlef, 2010: 154-155). The form of the state is, therefore, dynamic and his office, the government of the people, cannot be assured, in this context, if it doesn't evolves and adapts.

2.2 The changes in citizens' way to exercise the sovereignty

Sovereignty and citizenship are strongly related concepts. It is worthy to remember that citizens possess rights and have a relationship of equality of one another under the law. They are neither mere subjects whose rights are delegated by a higher authority nor objects of a political entity. The citizens have the right to participate formally with the election of the legislative and —directly or indirectly— the executive. Indeed, in classical political theory, the notion of sovereignty translates into a representative constitutional system, because traditionally it has been understood that a state cannot be governed by direct democracy, given the impossibility of direct representation of its citizens. But this premise, which formerly wasn't allowed discussion, it has become sterile or ineffective, precisely for the vast options that ICTs involve, which will be studied in the next head.

3. A paradigm shift in rule of law's effectiveness

When we try to measure the effectiveness of rule of law principle in practice we have get some items, including the powers transparency and the citizens participation. We must note that both items are also key pieces in the new paradigm of 'Open Government', which has become a topic of discussion thanks to President Obama, and that pretends to reach a new unprecedented level of transparency, participation and collaboration through the use of ICTs.

3.1 Subjection and accountability of powers through e-transparency

It is commonly understand that transparency promotes accountability and facilitates the formation of public opinion about government actions. In this regard, precisely, knowledge of information relating to the management of government helps to enrich the public debate and allows citizens to exercise democratic control over the actions of State authorities. Thus transparency is a sample of the quality of democracy, only openness and access to information can guarantee an effective control of state powers by the public. Surely, for this reason, the concepts of e-government and e-democracy were born bound to the e-transparency. Specifically, the objectives of e-democracy were defined in a precursor G-8 report on electronic democracy, which classified the transparency as a 'first step towards the realization of a lively and useful process of online public consultation' (GOL, 2001).

The uses of ICTs *ad hoc* powers transparency have benefits in a double sense. On one hand, we find the process benefits —e.g. anywhere, anytime access to transparency information; reducing costs for transparency—. Thus e-transparency allows accessibility —anywhere, anytime—, which means the ease with which one can actually make use of the possibility of consulting government information electronically, instead of simple access to information (Cerrillo, 2005). It is true that e-transparency is not a universal panacea, because it also bring costs —technology, training and implementation, staff time, and so on—, nonetheless the economic costs are much lower with the use of ICTs than without them. Moreover, the process of e-transparency is more accountable, due of ICTs can automate public service processes that were previously under the control of —fallible, corruptible— humans. On the other hand, there are also governance benefits, because e-transparency empowers citizens and makes public servants behave less corruptly under the surveillance of the public eye.

A good test of governmental e-transparency is the so called 'Open Data' (see for instance <http://data.gov.uk/data> or <http://dadesobertes.gencat.cat>), which is integrated within the purpose of providing greater transparency to government through ICTs by giving citizens information in his power in order to reuse, analyze and evaluate public management, or create derivative thereof services. The proposed opening of data responds to economic interests too, and increases interoperability between administrations, facilitating the creation of services to citizens using data from different administrations, and promotes efficiency in the internal organization and classification of data held by the administration. Most governments in constitutional democracies are increasingly recognizing the benefits of making their data open and reusable through ICTs, thinking essentially in economic interests, e.g. the European Commission stated that the wide availability of Public Sector Information can be a key driver to develop content markets in Europe, which can generate new businesses and jobs and provide consumers with more choice and more value for money (Digital Agenda for Europe, 2010).

But the truth is that we already knew the benefits of using ICTs to ease transparency long ago. Specifically, it was in 1993 when Al Gore introduced a pioneer report —Agenda for Action in context of National Information Infrastructure— raising the importance of using new technologies to improve the flow of information between public administrations and citizens. To be precise, the Agenda includes a principle to 'provide access to Government information and improve government procurement' and actions as 'to convert their public information into electronic form and disseminate it over the Internet, where it will be available to many more people than have previously had access to such information' (Al Gore, 1993). Since the appearance of Agenda for Action to date, there have been many technological opportunities to open the doors of the government to the citizenship. In fact, as we have seen, all efforts to implement the use of ICTs in the government —e-democracy, e-government, and so on— have explicitly recognized the willingness to give greater transparency (GOL, 2001). This makes it easy to achieve the following conclusion: what is happening today is nothing more than the reintroduction of an old idea —electronic transparency— that long ago was raised and has been placed, time after time, at the bottom back of the line of government priorities. In a similar vein Lorenzo Cotino reminds us that 'e-transparency it is something not essentially new

because it appears as an essential item since 1993. Today, in fact, we continue talking about the reuse of information, the public information as a raw material. Something today renamed as “Open Data” with essentially economics goals’ (Cotino, 2011). Thus we can say that we have known for a long time that ICTs ease the transparency of state powers, and yet, we find a remarkable laziness of the legislative, which is committed mainly for economic reasons, such as the Open Data.

3.2 Public e-participation in formation of law

Another item to measure the rule of law effectiveness is the citizens’ participation in the *res publica*. It should be understood that the more public participation the more civic engagement there is. In other words, participation increases effectiveness of government, which improves the quality of their decisions as a result of the opening and direct contact with the views and concerns of citizenship. In the e-participation fashion, there are many possibilities that ICTs offer us which travel ‘from setting up a new system that takes into account the views of citizens in decision-making to electronic voting’ (Simon, 2011). The democratic constitutions usually include some kind of public participation, beyond the formal vote. For example, the Spanish Constitution contains a set of rights —articles 21.1, 22.1 and 28.1— relating to citizens’ participation in public sphere, as a sign of the importance of political and ideological diversity of citizenship in a democratic society: rights to peaceably assemble, association and participation are recognized too in European Convention of Human Rights —article 11—. These are individual rights related to social and democratic State (Simon, 2011) that point out a sphere that empowers citizens to act together and express their convictions, ideas and opinions.

Now all these individual rights can have an incredible scope by the use of ICTs by the public authorities. In fact, ICTs may facilitate the formation of a free public opinion, which evaluate, criticize and control the powers involved in public affairs. And much more than this: make possible the participation of citizens in formation of law. This is a much more ambitious idea than the limited reading that only links participation and ICTs with reference to electronic voting (Cotino, 2005). It is a wide interpretation of e-democracy that describes a technical modernization of political and democratic processes of the political system in particular, which requires develops new methods for communication and participation of citizens. A good example of the ICTs possibilities is the European Citizens’ Initiative (hereinafter, ECI), a new legal framework for participatory democracy in Europe, that allows every single national from the Member States to trigger the EU law-making process — article 11.4, Treaty of European Union—. Such an initiative allows bottom up participation, empower citizens to ‘play an active role in opening deliberations about a particular legislative request’ (Cuesta, 2010). The recent Regulation (EU) no 211/2011 states that the organizers may collect statements of support in paper form or electronically —article 5.2— and point out by 1 January 2012, the Commission shall adopt technical specifications —article 6.5— and set up and thereafter shall maintain open-source software incorporating the relevant technical and security features necessary for compliance with the provisions of this Regulation regarding the online collection systems —article 6.2—. Thus the Regulation (EU) no 211/2011 has stated the collection of web support —from netizens— as a structural element of ECI, which is an innovative and transnational example of direct democracy, but also a key medium to revive the political debate (Cotino, 2011: 323-378). Logically, this new system requires a procedure to ensure reliability, the authentic will of the signer and has not made an improper use of signatures collected for other issues. Moreover than the important contribution of the Regulation by providing the use of ICTs in order to collect signatures, it is also conceivable that European citizenship will involve in collaborative and participatory develop and improve the applications to make them available to promoters of ICE. This last idea appears as a logical consequence of work with open-source software, which allows online collection signatures. Obviously, we still have to wait and see the practical impact of the ECI, although we can note right now that is a good example of use of ICTs to improve citizens participation, including such a relevant aspect as the formation of law.

4. Iceland laboratory and the Constitution 2.0

Probably the best example of the fact that we can take one more step to achieve real effectiveness of the rule of law through ICTs is found in the Iceland ‘laboratory’. Both e-transparency and e-participation in formation of law means empowerment to citizens, who can exercise sovereignty directly. Indeed we can state that the new Iceland constitution was the first to ever be born completely in the public eye (Constitutional Council of Iceland, 2011). It’s true that normally the constitutional assemblies are open to some sort of public scrutiny, e.g. with the final referendum of the Constitution, a text which had been previously written only by a select few. It is understood that the referendum

legitimizes all constitutional processes. But in the case of Iceland's Constitution it was different because was broadcast on the internet and it gave further meaning and extension to rule of law. It is worth remarking some examples of it: council members regularly interacted with citizens which free involve through website; every week the latest drafts related to the text of new Constitution were shared via a public website; there was a regular e-newsletter with the last events in constitutional draft; live broadcasting of the open council meetings were shown every Thursday via website and other social networks as *Facebook*. To be precise, the rules of procedure of the constitutional council [hereinafter, RPCC] in Iceland stated that council meeting shall be held in public pointing out the need to publish on the Council website no later than the day before the meeting —article 9 RPCC—. It also lay down the basis of broadcasting of meetings via website, which must provide live and recordings of the broadcasts of meeting and a transcript of the discussions —article 11 RPCC—. The general public participation via Council website was provided as well —article 14 RPCC—, and all amendments proposals should have been discussed and debated before the constitutional council voting each article of the draft bill —article 15 RPCC—. This raises an unusual scenario, which kept in mind the people's opinion in the formation of their supreme law, which is sovereign as well because although the Constitution emanates from the people, they also remain subject to it (De Otto, 2010: 933). In any case, Iceland used ICTs like never before to open up their constitutional process to the entire world and attract the attention of their citizenship. Giving the opportunity to participate in the formation of the law we are legitimizing the democratic system.

4.1 Underlying issues

Despite the undoubted positive remarks that 2.0 Iceland Constitution wake up, it is also true that there are underlying issues. It is logical to understand that such a broad participatory process is easier to perform in a small country like Iceland, where population does not exceed 400,000. The economic costs of translating public participation via ICTs into Constitutional Council debates are undeniable. Thus deliberation generates significant economics costs, which also comes from security measures —data protection and ensuring that those involved is really a citizen of the country—. Therefore it raises the question: is a 2.0 Constitution in a country with much more population viable? Maybe it will take years before we know if 2.0 Constitution it is a smart option or an impossible one.

We should also note that it is also possible that citizens do not participate in constitutional process in spite of having the chance to do it. In other words, giving the chance to take part in policy-making processes does not guarantee the citizens participation, probably because they are not prepared for it. The problem is to know whether democracy requires larger doses of popular participation, and what mechanisms can contribute to it without overburdening —costs and transaction time— the already weary shoulders of citizens (Subirats, 2002: 96). Furthermore, the 2.0 Constitution does not guarantee widespread public support nor even success. Nevertheless, from a democratic perspective, the possibility to open a participatory system with direct democracy in the policy-making process of such an important law as the Constitution, it must be valued positively.

Finally, we must note that the open policy-making processes to citizenship will not be the panacea for all ills. For example, we can remember that some authors defend that, contrary to popular belief, the Internet and ICTs have done little to broaden political discourse but in fact empowers a small set of elites (Hindman, 2009). The key idea of Matthew Hindman is that while ICTs and Internet have increased some forms of political participation and transformed the way interest groups and candidates organize, mobilize, and raise funds, elites still strongly shape how political material on the Web is presented and accessed. Thus at the end, it may be easier to speak in cyberspace but it remains difficult to be heard if public authorities do not defend net neutrality, ensuring free and equal access to information being disseminated via Internet.

5. Concluding remarks

We started this paper sketching out the term 'rule of law' and pointing out some problems of sovereignty's notion, which has become in crisis due to the end of physical and conceptual borders amongst states and for the new manner in which citizens' exercise the sovereignty. In both cases ICTs have played an important role and calls for a rethinking of the notion of sovereignty. It is necessary to remember that the rule of law states that no one is above the law, which comes from the people. Traditionally, the legitimation of the Constitution stems from referendum voting and the legitimation of the rest of the laws have their root in a representative constitutional system. Indeed, it has been understood that a state cannot be governed by direct democracy (Rousseau, 1969: 70).

Nevertheless, as we have seen with the example of Iceland, ICTs may change even that. We must keep in mind that Internet and ICTs are an important medium for receiving information as well as providing information and interacting with society. The transparency and participation via Internet are shifting the relationship between the citizenship and the state. For the first time in history citizens can take part in decision-making legislative process, not only by electronic voting, but with comments, arguments and ideas which could be then performed into law. Therefore we are talking about enhancing the participation of citizens and contributing to better legislation, even a deliberative Constitution carried out by citizenship through ICTs. Moreover, this new empowerment of citizenship and their engagement with the State means more effectiveness of the rule of law principle. Maybe for this reason, referring to this new paradigm, we should start talking about the 'rule of e-law'.

References

- Agrast, M., Botero, J. C. and Ponce, A. (2011) *WJP Rule of Law Index 2011*, The World Justice Project, Washington, D.C.
- Al Gore (1993) *The National Information Infrastructure: Agenda for Action*, [online], <http://es.scribd.com/doc/37110982/The-National-Information-Infrastructure-Agenda-for-Action>
- Cerrillo Martínez, A. (2005) "E-información: hacia una nueva regulación del acceso a la información", *Revista de Internet, Derecho y Política*, No. 1, pp1-16.
- Chevallier, J. (1994) *L'Etat de droit*, Montchrestien, Paris.
- Constitutional Council of Iceland (2011) Rules of procedure, [online], <http://stjornlagarad.is/english/rules-of-procedure/>
- Cotino Hueso, L. (2005) "El voto electrónico o la casa por el tejado. La necesidad de construir la democracia y la participación electrónicas por los cimientos", in *Libertades, democracia y gobierno electrónicos*, Lorenzo Cotino Hueso (Ed), Comares, Granada, pp328-347.
- Cotino Hueso, L. (2011) "Del "deber de publicidad" de Brandeis al "Open Government" de Obama. Regulación y control de la información pública a través de las nuevas tecnologías", [online], conference given at "La Protección de los Derechos Humanos para las Defensorías del Pueblo", 1-3 June, AEI-Universidad Alcalá de Henares, <http://goo.gl/br3rs>
- Cotino Hueso, L. (2011) "El Reglamento de la Iniciativa Ciudadana Europea de 2011: Su especial regulación de la recogida de apoyos vía internet y de la protección de datos de los ciudadanos", *Revista de Derecho Político*, No. 81, pp323-378.
- Cuesta López, V. (2010) "The Lisbon Treaty's Provisions on Democratic Principles: A Legal Framework for Participatory Democracy", *European Public Law* 16, No. 1, pp123-138.
- De Hert, P. and Gutwirth, S. (2006) "Privacy, data protection and law enforcement. Opacity of the individual and transparency of the power", in *Privacy and the Criminal Law*, Erik Claes, Antony Duff and Serge Gutwirth (Eds), Intersentia, Antwerpen—Oxford, pp61-104.
- De Otto y Pardo, I. (2010) *Obras completas: Derecho constitucional. Sistema de fuentes*, Centro de Estudios Políticos y Constitucionales/Universidad de Oviedo, Oviedo, pp931-933.
- Ferrajoli, L. (1998) "Más allá de la soberanía y la ciudadanía: un constitucionalismo global", *Isonomía*, No. 9, pp173-184.
- Ferrajoli, L. (2007) "The past and the future of the rule of law", in *The Rule of Law History, Theory and Criticism*, Pietro Costa and Danilo Zolo (Eds), Springer, Dordrecht, pp323-352.
- Government Online International Network (2001) *Online consultation in 90 countries. Initiatives to foster e-democracy*, [online], <http://www.governments-online.org/documents/e-consultation.pdf>
- Habermas, J. (1994) *Historia y crítica de la opinión pública*, translation of Antonio Domènech, Gustavo Gili, México, D. F.
- Hindman, M. (2009) *The Myth of Digital Democracy*, Princeton University Press, New Jersey—Oxford.
- Hobbes, T. (1996) *Del ciudadano y Leviatán*, translation of E. Tierno Galván and M. Sánchez Sarto, Tecnos, Madrid.
- Jefferson, T. (n.d.) "Politics & Government", [online], <http://bit.ly/vWsT5k>
- López Ayllón, S. (1999) "Globalización, estado nacional y derecho. Los problemas normativos de los espacios deslocalizados", *Isonomía*, No. 11, pp7-20.
- Paine, T. (1995) "To the Authors of *The Republican*", in *Collected Writings*, Eric Foner (Ed), Library of America, New York.
- Rousseau, J. J. (1978) *El contrato social*, translation of C. Berges, Aguilar, Madrid.
- Simón Castellano, P. (2011) "Los límites jurídico-constitucionales de la Administración electrónica en España y el Open government", *Revista Aranzadi Derecho y Nuevas Tecnologías*, No. 27, pp69-88.
- Subirats, J. (2002) "Los dilemas de una relación inevitable: innovación democrática y tecnologías de la información y de la comunicación", in *Democracia digital: límites y oportunidades*, Heriberto Cairo Carou (Ed), Trotta, Madrid, pp89-113.

A way to Overcome the Crisis in eGovernment: Cooperation Among the Regional and Local Authorities in Catalonia

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Abstract: The economic crisis forces us to find new strategies to improve the development of eGovernment. By cooperating, regional and local governments within can save time and money by sharing their resources. In Catalonia different mechanisms have been used to drive cooperation in eGovernment which has become known as the Catalan model of eGovernment. The evolution experienced in Catalonia in the development of eGovernment has allowed us to shape a Catalan model of eGovernment, which is distinct from eGovernment models elsewhere both at nationally and internationally. The Catalan model of eGovernment aims to improve transparency, efficiency and quality in the public sector in Catalonia through the use of electronic means. It aims also to improve the relationships between public sector bodies, citizens, businesses and organizations. To achieve this aim, regional and local governments cooperate in defining strategies for the development of the use of the Internet. They also cooperate with the aim of finding common solutions to problems and challenges posed by the widespread use of electronic means both in the relations between government and citizens and in their internal management systems. This cooperation is also reflected in the interoperability between computer applications and information systems used by the different public administrations in Catalonia and in the reusability of applications created by them. This cooperation is channelled, among other means, through the Consorci Administració Oberta de Catalunya (AOC Consortium) which not only facilitates the cooperation between Generalitat de Catalunya (Catalan regional government) and local entities, but also guarantees their autonomy. The Catalan model of eGovernment takes advantage of economies of scale to offer organizational and technological solutions for public administrations. It avoids asymmetries, inefficiencies and costs so that computer applications and information systems needed by everyone need only to be developed once. The Catalan model of eGovernment is also an opportunity to transform these public bodies and to save public resources especially during this recession. In this paper we will analyze the Catalan model of eGovernment and we will also show the mechanisms of cooperation between the different regional and local authorities in Catalonia which have also an impact to overcome the economic crisis.

Keywords: eGovernment; interoperability; cooperation; Catalan model of eGovernment

1. eGovernment in times of crisis

The economic and financial crisis is also affecting Public administrations, which are developing different methods to deal with the consequences of the crisis, both at a social level and within Public administrations themselves. As has been noted by the OECD, among others, eGovernment has an important role in times of crisis (OECD, 2009).

The economic crisis may lead Public administrations to carry out cuts in resources allocated for the development of eGovernment. However, it may also encourage them to support the development of the use of information and communication technologies (ICTs) more than before, given the positive effect this may have on combating the crisis. The crisis will thus enable sufficient development of eGovernment. In this paper we consider how eGovernment itself may triumph over the economic crisis.

The drive for eGovernment in times of crisis may be carried out independently by each Public administration, or may be promoted by all of them together in a coordinated and cooperative approach. In this paper we set out to evaluate the impact that cooperation can have in overcoming the difficulties the crisis poses for the development of eGovernment.

We believe that cooperation responds to the key needs that the crisis creates in terms of eGovernment. In order to enable us to confirm our hypothesis, we will in this paper approach the principle of cooperation and the different mechanisms that there are for achieving it. In particular, we will focus our attention on the Catalan model of eGovernment as a case study that provides us with important information with regard to answering the question that has been put forward.

As a starting point, we may find it useful to bring up the words of the European Commission, which states that "with the rapid development of ICT, there is a risk that Member States opt for different or

incompatible solutions and that new e-barriers could emerge that would impede the proper functioning of the internal market and the associated freedoms of movement. This could have negative effects on the openness and competitiveness of markets and on the delivery of some services of general interest to citizens and enterprises, whether economic or non-economic. Member States and the Commission should increase their efforts to avoid market fragmentation, achieve interoperability and promote commonly agreed ICT solutions, while ensuring the appropriate governance”.¹

2. Interadministrative cooperation in the development of eGovernment in Spain

The relationship between Public administrations in the final take-off of eGovernment is one of the key motors facilitating its development (European Commission, 2003). In particular, effectively guaranteeing electronic access for citizens to public services can only be achieved if there is cooperation between Public administrations and if such administrations communicate and connect with each other. Furthermore, during times of crisis, cooperation may facilitate greater effectiveness, efficiency and economy in the development of eGovernment.

As Public administrations increase electronic dissemination of information and provision of services, there is more need to improve communication and connections between them (Trudel, 2007, 4). If Public administrations continue to develop their eGovernment in isolation, then the purposes of eGovernment will not be achieved. Citizens will not perceive the effects and benefits of using electronic means in Public administration, which are meant to make it more accessible, efficient and open. The cost will also be far greater due to the fact that the same computer applications and systems used by different Public administrations will need to be developed separately by each and every one of them.

In this sense, the European Commission has made clear its opinion, stating that “failure to put in place interoperable eGovernment systems will have both economic and social costs. These include: static unresponsive Public administrations that are expensive to run and incapable of implementing policy promptly; inability to develop value added eGovernment services; higher costs, greater administrative burden and competitive disadvantage relative to local firms (e.g. inability to participate in public e-procurement activities), and hampering the proper functioning of the Internal Market” (European Commission, 2003, 19). Therefore, Decision No 922/2009/EC of the European Parliament and of the Council of 16 September 2009 on interoperability solutions for European Public administrations (ISA) states that “citizens and enterprises would also benefit from common, reusable and interoperable solutions and interoperable administrative back-office processes, as those solutions and processes would promote the efficient and effective delivery of public services to citizens and enterprises across borders and sectors” (whereas 7).

In Spain the Central State Administration, the administrations of the Autonomous Communities and local authorities have been collaborating for years on the development of eGovernment (Cerrillo i Martínez, 2010). The different mechanisms channelling interadministrative cooperation in the area of eGovernment are currently defined in Act 11/2007, of 22 June, on electronic access for citizens to public services (hereafter, the Spanish eGovernment Act).

The Spanish eGovernment Act establishes the principle of cooperation in order to ensure the interoperability of the systems and solutions adopted by each Public administration, as well as joint provision of services to citizens. And, to that effect, it provides for various mechanisms that facilitate interadministrative cooperation and ensure interoperability (Cerrillo i Martínez, 2010).

Firstly, the Spanish eGovernment Act creates the *Comité Sectorial de Administración Electrónica* (Sector Committee for EGovernment) as a technical body to channel cooperation between the Central State Administration, the administrations of the autonomous communities and local authorities. This body must ensure the compatibility and interoperability of the systems and computer applications used by Public administrations. It must also prepare joint action plans to boost development of eGovernment.

¹ Decision No 922/2009/EC of the European Parliament and of the Council of 16 September 2009 on interoperability solutions for European public administrations (ISA)

Secondly, the Spanish eGovernment Act recognizes the role of interoperability by establishing that “Public administrations shall use information technologies in their relationships with other administrations and with citizens, implementing IT, technological, organisational and security measures that ensure a suitable level of technical, semantic and organisational interoperability and avoid discrimination against citizens on the basis of their technological choice”.

Thirdly, the Spanish eGovernment Act specifies the mechanisms and computer applications through which interoperability may be achieved. These mechanisms must ensure an adequate level of technical, semantic and organisational interoperability (Gamero Casado, 2009).

The main mechanisms provided for in the Spanish eGovernment Act in terms of ensuring interoperability is the *Esquema Nacional de Interoperabilidad* (ENI) (National Interoperability Framework) (Cerrillo i Martínez, 2010). The National Interoperability Framework establishes the criteria and recommendations about standardization of information, formats and computer applications and about preservation of information to be taken into account by Public Administrations when adopting technological decisions so as to ensure interoperability. Spanish Royal Decree 4/2010, of 8 January, regulates the National Interoperability Framework in terms of eGovernment and lays down the various mechanisms through which organisational, semantic and technical interoperability are defined (list of data models; inventory of administrative procedures and provided services; Centre of semantic interoperability of the Administration and Directory of free reuse applications). Furthermore, it lays down the basic principles that must govern the ENI (interoperability as integral quality; multidimensional character of the interoperability and approach of multilateral solutions). Lastly, the technical standards of interoperability are determined; Public administrations are bound to comply with these standards and they will be adopted by the Ministry of the Presidency at the proposal of the Sector Committee for EGovernment.

The Spanish eGovernment Act also provides for other mechanisms to facilitate networking between the different Public administrations, such as the *Red de Comunicaciones de las Administraciones Públicas Españolas* (Communications Network of Spanish Public Administrations)² and the *Red Integrada de Atención al Ciudadano* (Integrated Network of Citizens' Assistance Offices).³

Lastly, in order to facilitate interoperability, the Spanish eGovernment Act also provides for the reuse of systems and applications of Public Administrations. The reuse of systems and applications is an mechanisms through which administrations that own the intellectual property rights of applications, whether such applications were developed by the administrations themselves or by a third party, may make these applications available to any Public administration for free and without the need for an agreement. Such applications may be declared open sources.

Despite the implementation of various cooperation mechanisms provided for in the Spanish eGovernment Act, it is understood that, to date, no study has been carried out on the impact these have on the effectiveness, efficiency and economy of the development of eGovernment in Spain.

3. The Catalan model of eGovernment

The principle of cooperation has also been laid down in some legislation in autonomous communities that has been passed on the subject. Of particular interest is Act 29/2010, of 3 August, on the use of electronic means in the public sector in Catalonia (hereafter, Catalan eGovernment Act), which includes among its aims the consolidation of collaboration and coordination mechanisms between Generalitat of Catalonia (regional Public administration) and local Catalan entities in the development of policies and services for the introduction and use of electronic means. The principles covered in the Act also include those of cooperation and collaboration for which public sector entities must work together, share strategies and create joint organisational and technological solutions, as well as ensuring interoperability of their information systems.

Generalitat of Catalonia and local Catalan entities have been cooperating together for many years on the development of eGovernment. This has given way to what is known as the Catalan model of eGovernment.

² <http://www.csi.map.es/csi/pg5r12.htm>

³ Spanish Cabinet Agreement of 15 July 2005, for the implementation of a Network of Integrated Citizens' Assistance Offices in collaboration with the Autonomous Communities and Local Government Entities and <http://www.060.es/>.

The Catalan model of eGovernment seeks to improve the transparency, effectiveness and quality of the public sector in Catalonia through the use of electronic means in the relationships between public sector entities, citizens, companies and organisations. In order to do that, they rely on joint responsibility when deciding upon strategies for increasing the use of electronic means in Generalitat of Catalonia and local Catalan entities. This joint responsibility is shared between all stakeholders involved and also applies to finding joint solutions to the problems and challenges that arise from the development of eGovernment in Catalonia.

This joint responsibility results in cooperation between Generalitat of Catalonia and local Catalan entities, with the aim of finding joint solutions to the problems and challenges that result from more increased use of electronic means, both in relationships between Public administrations and with citizens, as well as in internal management of Public administrations. This joint responsibility also applies to interadministrative collaboration that results in the interoperability between the applications and information systems developed and used by the various Public administrations, as well as the reusability of the applications created by the various Catalan Public administrations. Therefore, this joint responsibility results in the creation of joint mechanisms in order to facilitate interoperability between the Generalitat of Catalonia and local Catalan entities as well as joint eGovernment services.

This takes advantage of economies of scale in order to offer joint and corporate organisational and technological solutions and avoid discrepancies, inefficiencies and costs. As such, the tools required by all Public administrations are only developed once, without repetition. This constitutes a key difference in the development of eGovernment between Catalonia and other models around us. Mechanisms are also established to ensure that there are general public solutions for eGovernment.

The Catalan model of eGovernment materialised as a result of the signing of the Agreement for the promotion and development of the information society in Generalitat of Catalonia and local Catalan entities. This was signed in July 2001 in the Parliament of Catalonia by parliamentary groups, the Government of the Generalitat of Catalonia and Localret, which was representing local entities. By reading the Agreement, we observe the will of the signatories to “promote, jointly, such measures that enable progression toward the information society and, more specifically, toward a new concept in relationships between citizens and administrations. Relationships that are more focused on the citizen and that work towards procedures and administrative services being carried out online. Likewise, measures that enable administrative procedures and the exchange of information between administrations to be simplified, without causing confusion to the user as regards which administration has authority. These would make much of the paperwork that citizens are required to carry out today obsolete”. Furthermore, the Agreement recognised that “in order to better serve citizens, it is absolutely necessary to begin a new chapter in interadministrative relations”.

In 2010, the Catalan model of eGovernment was laid down in the Catalan eGovernment Act, which includes the features on which the Catalan model of eGovernment is based, outlines the responsibilities of the various participating stakeholders and establishes the mechanisms through which the model is developed.

3.1 The stakeholders participating in the Catalan model of eGovernment

Various public entities participate in the Catalan model of eGovernment. The various entities involved as well as the functions they carry out and the contributions they make to the model are briefly listed and described below.

Furthermore, certain elements that show the scope of participation of each entity in the group will be detailed.

3.1.1 The Generalitat of Catalonia and local entities

The Generalitat of Catalonia, local entities and other Catalan public sector entities are responsible for the development of the Catalan model of eGovernment.

The Generalitat of Catalonia and local Catalan entities must decide upon strategies to make progress with the use of electronic means. They must also design, implement and develop the computer applications, procedures and mechanisms that are necessary to facilitate the use of electronic means in relations between citizens and public sector entities, as well as those that are necessary to facilitate

interoperability with other computer applications and reusability by other public sector entities; they must also promote the use of electronic means in relations with citizens. Lastly, they must use electronic means in relations with other public sector entities and bodies in Catalonia.

Furthermore, the Generalitat of Catalonia shall carry out certain activities with the aim of contributing to the development of the Catalan model of eGovernment in the Catalan public sector, encouraging the use of electronic means in local entities and cooperating with them in the performance of their duties as regards eGovernment, as well as designing and developing interoperable applications.

In addition to the actions carried out by each Public administration, the Generalitat of Catalonia and local Catalan entities must collaborate on the development of eGovernment.

3.1.2 Consorci Administració Oberta de Catalunya (*Open Administration Consortium of Catalonia*)

The Generalitat of Catalonia and local Catalan entities cooperate and collaborate in the field of eGovernment through the Open Administration Consortium of Catalonia (AOC Consortium).

The AOC Consortium was created in 2002 with the aim of implementing the agreements contained within the Agreement and is made up of the Generalitat of Catalonia and local entities, through the Localret Consortium.⁴

The AOC Consortium fulfils various roles that have an impact on the use of electronic means in the completion of administrative procedures, such as the development of electronic applications, tools and services and the promotion of their use, as well as the drawing up of criteria and recommendations in order to ensure interoperability. The Generalitat of Catalonia and local Catalan entities cooperate and collaborate, through the AOC Consortium, on boosting and developing the use of electronic means in public sector entities in Catalonia and coordinating their strategies and actions as regards the use of electronic means.

The AOC Consortium also enables Catalan Public administrations to cooperate in defining and implementing joint strategies that must be developed in the creation and provision of joint electronic administration services for public sector entities in Catalonia. The AOC Consortium promotes the reuse of electronic administration applications and services that are developed, as well as the interoperability of information systems in the Catalan public sector.

The AOC Consortium also develops electronic applications, tools and services and promotes the use thereof within Catalan public sector entities. It also drafts criteria and recommendations in order to ensure interoperability of information collected by Catalan public sector entities.

The AOC Consortium currently bases its strategy on three service lines for Catalan public sector entities:

- interadministrative collaboration services that aim to promote the exchange of information between Public administrations via electronic means in order to improve efficiency and effectiveness, that is, to promote interoperability between the information systems of Catalan Public administrations;
- common eGovernment services that provide support to projects promoted by Catalan public sector entities that incorporate electronic means, boosting the reuse of solutions;
- basic electronic identity and signature services and digital preservation services, in order to maintain legal and technical security requirements in relations between administrations and users that are carried out electronically, that is, to improve security and generate trust in the use of such means, which are developed with the *Agència Catalana de Certificació* (Catalan Certification Agency).

Lastly, the AOC Consortium provides, on behalf of the Administration of the Generalitat of Catalonia, financial support to local entities for the development of eGovernment projects and initiatives.

⁴ Localret is the local Consortium made up of the local administrations of Catalonia. More than 800 local entities are currently members of the consortium. In terms of eGovernment, Localret provides services such as assistance in the application of the Spanish eGovernment Act, eGovernment by-laws and a public administration electronic contracting platform (PECAP).

3.1.3 Other stakeholders

There are also other stakeholders participating in the Catalan model of eGovernment. In particular, we would like to mention second-level local entities (county and regional councils) that may provide cooperation and assistance to local administrations in terms of the use of electronic means.

County councils provide legal, economic and technical assistance and cooperation for the development of the use of electronic means by local entities, especially those that have less economic and management capabilities.

Regional councils provide on-the-spot technical assistance to the municipalities that request it, in order to facilitate the incorporation and use of electronic applications, tools and services. They respond to the specific needs of the municipalities and provide support for any problems that may arise during the operation of these applications, tools and services.

3.2 The mechanisms of the Catalan model of eGovernment

The Catalan model of eGovernment works by implementing various mechanisms such as the *Marco de interoperabilidad del sector público de Cataluña* (Interoperability Framework of the Catalan public sector), the *Catálogo de Datos y Documentos Interoperables en Cataluña* (Catalogue of Interoperable Data and Documents in Catalonia) and the *Red de comunicaciones electrónicas de las administraciones públicas catalanas* (Network of electronic communications of Catalan Public administrations).

It is also important to mention the mechanisms for promoting the Catalan model of eGovernment. In order to do this, public sector entities are expected to boost the use of computer applications that have already been developed and shall ensure that any computer applications that may be developed are based on criteria and standards that assist interoperability. Also, in order to facilitate coordinated development of the use of electronic means in the Catalan public sector, the Administration of the Generalitat of Catalonia and local entities are expected to draw up a Development Plan for the use of electronic means in the Catalan public sector.

3.2.1 The interoperability framework of the Catalan public sector

The Interoperability Framework of the Catalan public sector ensures the necessary levels of technical, semantic and organisational interaction and integration in public sector procedures, through intensive use of information and communication technologies. This framework contains recommendations, guides and standards that Catalan public sector entities must follow on interconnection, data integration, metadata, access through telecommunication networks, security and accessibility.

The Interoperability Framework of the Catalan public sector is produced by the AOC Consortium, with the participation of Catalan public sector entities. The AOC Consortium also promotes compliance with and continued adaptation to the latest technology.

3.2.2 Catalogue of Interoperable Data and Documents in Catalonia

The Catalogue of Interoperable Data and Documents in Catalonia is a tool for the Catalan public sector, with which it fulfils the citizens' right to not have to provide the data and documents that are in the possession of Public administrations.

Catalan public sector entities must include in the Catalogue of Interoperable Data and Documents in Catalonia the updated list of data and documents that may be obtained electronically and the security mechanisms to access them, in order to ensure full security, privacy and protection of personal data.

The Catalogue of Interoperable Data and Documents in Catalonia is managed by the AOC Consortium.

3.3 Promotion of the Catalan model of eGovernment in the Catalan public sector

3.3.1 The reuse of applications and services

Reuse means that the systems and applications developed by a Public administration for their own needs are used by another Public administration for their needs. The reuse of applications brings with it numerous advantages. On the one hand, it implies a reduction in costs, both in economic terms since there is no direct cost, and in terms of time. On the other hand, it offers the chance to take advantage of experience acquired by the Public administrations that developed the application and those that have previously used or reused it. Reuse also has a positive impact on interoperability between systems and applications.

In order to achieve these aims, public sector entities, when providing their services, must promote the use of applications developed by other public sector entities. They must also endeavour to ensure that applications developed are based on criteria and standards that facilitate interoperability and may be reused by other public sector entities.

Public sector entities must promote the creation of resource banks and applications that can be reused, in order to take full advantage of such applications, as well as facilitating collaborative development.

3.3.2 The development plan for the use of electronic means in the Catalan public sector

The Development Plan for the use of electronic means in the Catalan public sector defines the priorities and the economic, technical and human mechanisms and resources necessary for the development of eGovernment in Catalonia. This Plan must also indicate the coordination and cooperation mechanisms between Catalan public sector entities. The duration of the Plan is four years.

The AOC Consortium collaborates in the development of the applications and services necessary to facilitate the achievement of the objectives of the Plan for the use of electronic means in the Catalan public sector.

Furthermore, the Administration of the Generalitat must, in accordance with the Development Plan for the use of electronic means in the Catalan public sector, ensure cooperation with local entities, by financing the infrastructures, systems and applications necessary for extending the use of electronic means in their activities.

4. Is cooperation an efficient way to develop eGovernment in times of crisis?

It has been shown that cooperation in eGovernment results in three main elements.

Firstly, deciding upon the stakeholders that participate in the networks being developed to facilitate and channel cooperation (governance of cooperation). Deciding upon the responsibilities of the various stakeholders, creating spaces for interrelation between them and formalising bodies in charge of promoting and developing applications that are to be used by all stakeholders demonstrates the principle of cooperation and, without a doubt, has a positive impact on the effectiveness and efficiency of eGovernment.

Secondly, it results in the recognition of interoperability as a mechanism for facilitating electronic relations between Public administrations. Interoperability is beneficial for citizens who do not have to transport documents from one Public administration to another or take documents with them each time they visit an office, since the office is already in possession of those documents. It also enables Public administrations to share information and other electronic resources easily, economically and securely.

Thirdly, reuse is a way to save resources in the development of eGovernment. The possibility for Public administration to use computer applications and information systems designed and developed by other Public administrations clearly implies savings, since there is no need to repeat work. This not only saves money, but other resources as well, such as time. Furthermore, reuse means that Public administrations share their experience and thereby avoid repeating the same mistakes and improve and enhance the development of eGovernment.

In general, the combination of these three elements means that the development of eGovernment is not only more effective, but also more efficient and economic. Effectiveness, efficiency and economy are features that are of great importance to Public administrations in times of economic and financial crisis. Therefore, all mechanisms that reduce the effects of the crisis must be deemed to be positive.

As we have seen, the Catalan model of eGovernment includes these three elements. Analysis of this model that has been carried out, which will need to be compared with specific data on the real effects, has shown us that there are various mechanisms for channelling cooperation between the Generalitat de Catalonia and that of other local entities in Catalonia, which can certainly facilitate the achievement of the goals and the development of eGovernment in times of crisis.

References

- Cerrillo I Martínez, A. 2010. Cooperación entre Administraciones públicas para el impulso de la Administración electrónica. In: Gamero Casado, E. & Valero Torrijos, J. (eds.) *La Ley de Administración electrónica. Comentario sistemático a la Ley 11/2007, de 22 de junio, de acceso electrónico de los ciudadanos a los Servicios Públicos*. 3a ed. Cizur Menor: Thomson-Aranzadi.
- European Commission 2003. Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions about "The Role of eGovernment for Europe's Future" [COM(2003) 567 final].
- Gamero Casado, E. 2009. Interoperabilidad y administración electrónica: conéctense, por favor. *Revista de Administración Pública*, 179.
- OECD 2009. The financial and economic crisis. Impact on eGovernment in OECD Countries. Paris: OECD.
- Trudel, P. 2007. Administració electrònica i interconnexió de fitxers administratius a l'Estat en xarxa. *Revista catalana de dret públic*, 35.

Taxpayer Rights in Turkey: A Survey on Income Taxpayers in Manisa

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Abstract: Declaration of taxpayers' rights is considerably new trend which has appeared on the literature from the beginning of 1990s (Duncan, 1998). Furthermore, the concept of taxpayer rights is trying to pull taxpaying behaviour from obligatory base to voluntarily base by raising awareness on citizenship by using taxpayer rights which recognized on the constitution and law. Therefore, governments are trying to create an environment to solve their taxation problems more efficiently by establishing reliable and stable links between revenue administration and taxpayers. Many countries have declared elaborated taxpayers' rights in a form of Taxpayers' Charter or Bill of rights and although they have been analysed in the literature, some countries still have not touched on such as Turkey. Turkey is a very promising area in the international literature and differs from many countries as a result of its population, historical roots, demographical specialties and growing economic strength. Moreover, in last decades importance of Turkey has become more observable. Especially, EU integration process and being the 16th biggest economy in the world by achieving the biggest growth rates among European countries in recent years drew attention from many academic circles. Furthermore, Turkey has a modern tax system and organised revenue administration which has become independent from ministry of finance at 2005 as a result of EU integration process. Moreover, in March 2006 Turkish Revenue administration has declared Taxpayers' bill of rights and established taxpayer rights and services directorships under 29 big cities' tax offices in Turkey. This paper aims to give a concise background information about taxpayers' rights in Turkey. Furthermore, it introduces Turkish literature about taxpayer rights and compares main aspects of taxpayer rights in Turkey with some other OECD countries. More importantly, findings of an empirical work are introduced for the first time about taxpayer rights in Turkey. A survey has been conducted in Manisa district, a western city of Turkey, among 291 income taxpayers to measure their response to taxpayer rights and paper analysed their awareness and understanding level of it. Lastly, the paper will be finalised with some conclusion remarks.

Keywords: taxpayer rights, Turkey, tax compliance

1. Introduction

Paying taxes has always been acknowledged as a duty. However, starting with last couple of decades, understanding of obligatory side has lost its significance as a result of rising importance on taxpayer rights. In other words, mindset of tax policy making has focused more on to increase the number of compliant taxpayers (Goranovic, 1998). In this purpose, taxpayers' rights are particularly important because it aimed to increase compliance by raising awareness of taxpaying behaviour as a right rather than obligation (Li, 1998). Taxpayer rights are first categorised by OECD (1990) in a report and observed that only a few number of OECD members are introduced taxpayer rights in their countries. Prior to that, declaration of taxpayer rights charter can be observed in UK in 1986 and USA declared it in 1988 by approving in the congress (Bentley, 1998). Further declarations and developments followed by many other countries such as Australia, Canada, France, New Zealand and Japan (Greenbaum, 1998). The paper mentions firstly to Turkish perspective on taxpayer rights and its development in Turkish tax system. Then it discusses results of the data analysis which has been collected in Manisa district, a western city of Turkey, from income taxpayers by face to face surveys. Lastly, it will be finalised with some conclusion remarks.

2. Turkish taxpayer rights

It will not be wrong to claim that the rights of taxpayers have always existed in Turkish tax law (Gercek, 2006). However, considering the rights of taxpayers as a systematic concern started with the effect of above-mentioned trend starting with 1990s. Turkish Revenue Administration has started total quality management program in 2001 by considering to increase service quality that delivered in tax offices in nine pilot cities. Moreover, the quality management program has extended to remaining cities after RA administration has become an independent body from Ministry of Finance in 2005 which allows to accelerate the decision making processes (Gunes, 2011). Considering the European Union integration process during the period, we can accept the fact that the Turkish revenue administration, which acts as an independent body, developed more service quality concerned

policies then before (Yucedogru, 2007). Consequently, in 2006 revenue administration has declared taxpayer rights charter in its website. The declaration states the policy as:

“Turkish Revenue Administration promises to work devotedly on the principles of respectful and honesty, within the concept of taxpayer-focused and qualified service, and to solve the problems in order to satisfy everyone who receives service with the conscious that taxpaying is not only a responsibility but also a right of being citizen and inquiry”¹

In order to reach this purpose it promised to taxpayers adequate and clear information, open communication, secrecy of taxpayers' information, fairness and quality in service.² Although Taxpayer rights charter only stands as a good intention declaration to the taxpayers and received many criticisms that the taxpayer rights should be protected, enforceability of taxpayer rights should be provided by law rather than declarations (Yalti, 2007; Ozgenc, 2007). Nevertheless, Turkish taxpayer rights are not in a weak position comparatively to other developed countries.

Table 1: Taxpayers rights in OECD countries (simplified table)

Taxpayers' Rights			
Country	A set of taxpayers' rights in law or other form	A set of taxpayers' rights in administrative documents	Special body to deal with taxpayers' complaints
USA	Yes	Yes	Yes
UK	*	No	Yes
Ireland	No	Yes	No
Turkey	No	Yes	No

*UK—A consultation on a taxpayer's charter was announced in 2008

Source: OECD, Tax Administration in OECD and Selected Non-OECD Countries: Comparative Information Series (2008)

Additionally, developing new services such as establishing free helpline (VIMER) in Revenue Administration to help taxpayers on their tax problems at 2008 also provides an evidence for continuous developing attention on taxpayer prioritising policies in Turkish Revenue Administration. Moreover, comparatively to other OECD countries Turkey can be seen on the higher places of the list in terms of providing relevant information to the taxpayers.

Table 2: Publications Related With Tax System in OECD countries (simplified table)

Country	Publications Related With Tax System					Internet Support	Free Helpline
	Tax declaration preparation guide	Tax Incentives Guide	General Publication	Publication for Schools	Publication on Public Spending		
USA	Yes	Yes	Yes	Yes	Yes	Yes	Yes
UK	Yes	Yes	Yes	No	No	Yes	No
Ireland	Yes	Yes	Yes	No	No	Yes	No
Turkey	Yes	Yes	Yes	No	No	Yes	Yes

Source: OECD, Tax Administration in OECD Countries: Comparative Information Series (2004)

3. The aim of the study

The aim of this study is to determine the level of taxpayer's awareness about taxpayer's rights and to analyze how taxpayer's rights are effective on tax compliance behaviours of taxpayers. In order to understand it, the focus of the study has selected as income taxpayers in Manisa Central District because, income taxpayers has been assumed to have more sensitive responses than other taxpayer groups such as companies in terms of taxpayer rights. Moreover, to understand the change of quality by internalizing the taxpayer rights, another survey has been conducted among tax office officials in Manisa. Our first survey has applied to 300 individuals who are income taxpayers. Respondents has been reached to number of 291 which represents 97% response rate. Additionally, different survey

¹ Please see Turkish Taxpayers' Rights charter : <http://www.gib.gov.tr/index.php?id=472>

² For more information please see the website: <http://www.gib.gov.tr/>

has been conducted about “taxpayers and taxpayer’s right” to the 98 officials who are working in tax office.

Table 3: The number of income taxpayers under Manisa Mesir Tax Office (2009-June)

Number of Income Taxpayers								
ORDINARY BASIS						LUMP SUM BASIS		
Business Profits		Agricul tural Incom e	Self- Employment Income	Income From Immovable Property	Total	Simple Entry Basis	Other Wage Earner	Total Simple Entry Taxpayers
1. Class	2. Clas s							
555	6.373	0	715	7.322	14.965	4.068	474	4.542

4. The method of the study

The data is collected by face to face questionnaires. Although the literature about taxpayer rights is limited, (Bentley, 1997; Wheelwright, 1997) some of existing research considered during the survey preparation such as IRS tax compliance survey (OECD 1990). In the study, survey is designed by considering: different cultural roots of the Turkish taxpayers from western societies such as history, family values, and religion. Additionally differences of tax law and revenue administration have also taken into account. Questionnaire has designed in two sections. First part is trying to undercover the demographics of taxpayers and second part has tried to find out taxpayers perception on taxpayer rights, tax compliance relationship, taxpayer awareness about taxpayer rights, government confidence-taxpayer rights correlation with scale questions from 1 to 5. Moreover, second section of the survey is attempted to measure whether taxpayer rights are applied or not in Turkish revenue administration services and second part is trying to investigate whether they have heard these rights before from revenue administration or related circles. Similarly, the survey applied to tax office officials to whether they have changed their understanding and attitudes towards taxpayers and to measure their awareness on taxpayers’ rights in Manisa.SPSS statistic program is used for analyzing the data. Primarily, frequencies were provided and after that, we determined the questions which we wanted to establish relations. These questions were subjected to independence chi-square test and correlation analysis.

5. Demographics

When we look at the survey’s demographic results, it can be understood that taxpayers’ profile is satisfyingly represents taxpayers in Manisa. Income taxpayers are highly consist of men, 75,1%. Taxpayers’ distribution on age group mostly concentrated on middle age group (67.2 %) between 30 to 50. Educational demographics of Taxpayers reveals that 63.6 % is graduated primary and high school. Additionally, considerable amount of taxpayers, 60.9%, are married.

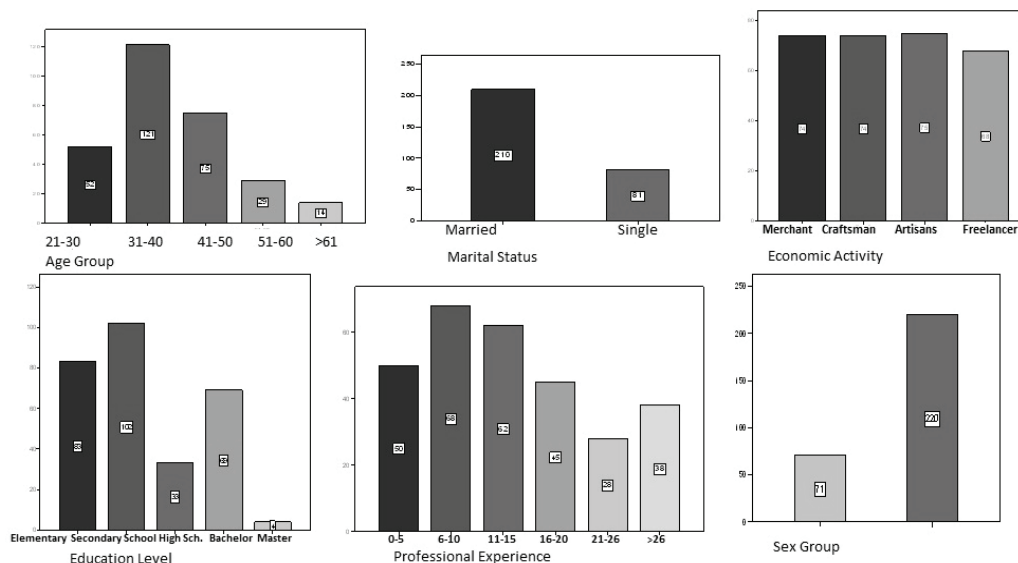


Figure 1: Demographic information on taxpayers

6. Cross table analyses of taxpayers' survey

The Belief on Taxpayer Rights will Protect Among The Economic Activity Type

Table 4: Relationship between economic activity and "I believe that my rights will be protected as a taxpayer" (Economic Activity*BI.s.14)

	I believe that my rights will be protected as a taxpayer.						TOTAL
	Strongly Agree		Agree	Neutral	Disagree	Strongly Disagree	
Mercantile Trader	tn %	18 24,3	15 20,3	22 29,7	18 24,3	1 1,4	74 100
Tradesman	tn %	18 25,7	19 21,7	15 21,4	11 15,7	7 10,0	70 100
Handicrafts man	tn %	19 26,4	30 41,7	12 16,7	11 15,3	0 0,0	72 100
Freelancer	tn %	17 25,4	32 47,8	5 7,5	9 13,4	4 6,0	67 100
TOTAL	tn %	72 25,4	96 33,9	54 19,1	49 17,3	12 4,2	283 100

$$\chi^2=33,111 \text{ sd}=12 \quad p=0,001$$

Taxpayers' responses to the statement of "I believe that my rights will be protected as a taxpayer" found significantly correlated between the types of economic activity. Handicraftsman and freelancers have more confidence about protecting their rights than Mercantile trades and Tradesman. Nearly 25% of mercantile traders and tradesman are not agreed or strongly disagree with the idea of "I believe that my rights will be protected as a taxpayer". Here it reveals that it might be a confidence problem with the tax authority and these types of taxpayers. Additionally, freelancer and Handicrafts man type of taxpayers are heavily trusting in government policies more than merchants and craftsmen. According to former research (Kasipillai et al, 2003) and writers' opinion is that this difference might be the result of educational differences between mentioned groups among income taxpayers. Handicraftsmen and freelancers are more educated than merchants and Tradesman in Turkey as a result of their legal certificate requirements of their jobs. Therefore, it might be important to consider education level as one of main the determinants on policy and tax law making process in Turkey. Furthermore, simplification of taxation processes on income taxpayers might encourage them to understand more on procedures to develop their level of trust on government. Consequently, this might increase taxpayers' rights awareness.

Table 5: Taxpayers rights in taxpayer charter and knowledge of taxpayers about their rights

I can take information by using e-mail service freely.	It is possible to take information about tax system by subscribing e-mail list of government.			TOTAL
		I don't know	I know	
Strongly agree	tn % 10 23,3	33 76,7		43 100
Agree	tn % 53 67,1	26 32,9		79 100
Neutral	tn % 29 74,4	10 25,6		39 100
Disagree	tn % 81 86,2	13 13,8		94 100
Strongly Disagree	tn % 26 89,7	3 10,3		29 100
TOTAL		199 70,1	85 29,9	284 100

$$\chi^2= 62,535 \text{ sd}= 4 \text{ P}<0,000$$

Above analysis is trying to crosscheck the taxpayer rights awareness among the taxpayers who are using the services of revenue administration and benefiting from them. 76.7% of taxpayers indicate that they are aware of tax system developments via free e-mail alert and they have knowledge about tax system at the same time. However, taxpayers who hasn't got information about the system is approximately 89.7% and this group said they couldn't receive information about tax system development by free e-mail alert. Evaluation of this statement shows that 70.1 % of taxpayers are not

aware of taxpayer's rights in the declaration. Consequently, they are not aware of their rights and cannot benefit from them. Therefore, taxpayers' rights should be introduced to the taxpayers. Besides, additional action from Revenue Administration (RA) might make a difference such as introductory meetings for taxpayers.

Comparative Evaluation of RA Employees and Taxpayers Survey

Table 6: Taxpayers have sufficient knowledge of their tax responsibilities

	Taxpayers have sufficient knowledge of their tax responsibilities						TOTAL
		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	
Revenue Administration	NE	0	4	30	53	11	98
	%	0	4,1	30,6	54,1	11,2	100
Taxpayers	NT	17	39	110	83	35	284
	%	6,0	13,7	38,7	29,2	12,3	12,3
TOTAL	NT+NE	17	43	140	136	46	382
	%	4,5	11,3	36,6	35,6	12,0	100

$\chi^2=25,922$ sd=4 p<0,001

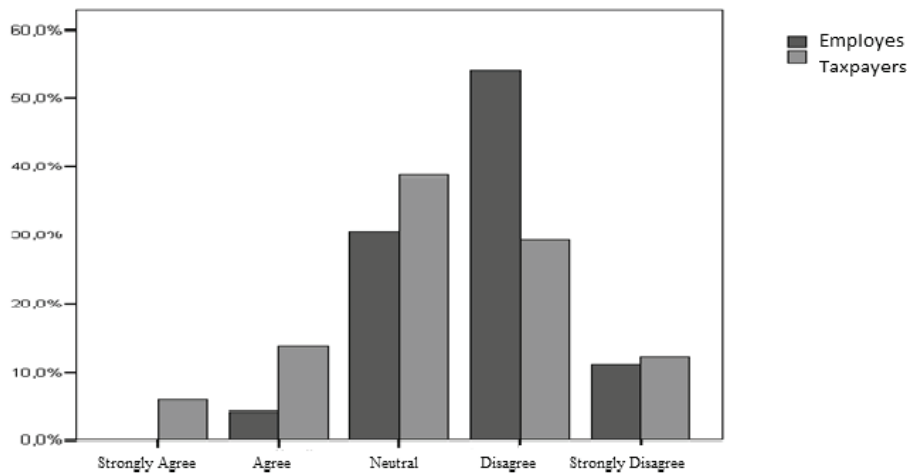


Figure 2: Taxpayers have sufficient information about their tax responsibilities

In order to evaluate the perception of tax office officials on tax responsibilities of taxpayers, "Taxpayers have sufficient information about their tax responsibilities." has been asked in the survey. Furthermore, same question has also directed to taxpayers as "I have enough information about tax responsibilities" on one to five likert scale. There is an obvious difference between evaluations of the taxpayers and RA officials in terms of tax knowledge of taxpayers.. Taxpayers are strongly agree, 13.7%, and agree, 6% that they have enough knowledge, while RA officials never completely agreed and agreed for 4.1%. Moreover, 54.1% of RA officials do not agree with the statement. Taxpayers' evaluation of themselves is better than how the officials understood them. It will not be wrong to claim that the interoperation of taxpayers own knowledge level is more likely to be wrong than tax officials as a result of expertise in the field. Therefore, wrong interpretations of law and processes might cause miscommunication between taxpayers and RA officials. Furthermore, this might prevent taxpayers not to understand or misunderstand taxpayers' rights.

7. Significant correlation results of the survey

In this section, some of the significant correlations between different statements of the data will be presented by grouping them into groups of necessity of taxpayer rights, honest taxpaying attitudes confidence level and fairness.

The Necessity of Taxpayer Rights

- Between "Taxes levied by the State returns as a service" and "I think it should be certain rights for taxpayers against the tax authorities" statements a noticeable positive correlation ($r = 0.219$ p < 0.001) has been observed. Taxpayers who are in favour of the opinion that "taxes which are taken by the State are returning to the taxpayers as services" are trusting to the state and at the same

time, this positive-minded taxpayers think that there should be enforceable rights of taxpayers against the tax administration.

- Statements of "Unpaid taxes today, negatively affect the welfare of future generations " and " I think it should be certain enforceable rights for taxpayers against the tax authorities" have a significant positive correlation, $r = 0.333$ $p < 0.001$.

Taxpayers Who Trust To The State Believe That Government Will Protect Taxpayer Rights

- Statements of "I believe that the taxes we pay are used properly by the state" and "I believe that my rights will be protected by law as a taxpayer" have a significant positive correlation ($r = 0.403$ $p < 0.001$). Confidence of taxpayers to the state taxes are correlated with the belief of taxpayers' rights will be maintained.
- Statements of "Taxes levied by the State returns as services" and " More transparent and accountable government is important to take place the taxpayer's rights clearly in the law " has positive correlation($r = 0.133$ $p < 0.026$). Taxpayers think the taxes which they paid returns as service and think the rights should be in law make more transparent and accountable state management.

Honest Taxpayer's Desire For Taxpayers` Rights Legislation

- "Taxes should never be evaded" and " More transparent and accountable state is important to take place the taxpayer's rights clearly in the law " has remarkable positive correlation ($r = 0.136$ $p < 0.022$) . Taxpayers who think taxes never be evaded, believe that rights of the taxpayer should take place openly in the law. Honest taxpayers are willing to have some legislative rights against the government.

Taxpayers With Higher Awareness Would Benefit From Tax Applications of E-Government

- Between the statements of "If taxes are not paid fully and accurately, government would delay maintaining effective public service" and " I use RA's internet applications sufficiently" there is a significant positive correlation ($r = 0.238$ $p < 0.001$). Awareness of taxpayers beneficial for them in terms of new applications of RA's on the Internet.
- Between the statements of "I believe that the taxes which I paid, used correctly by the government" and " I use RA's Internet applications sufficiently" there is a strong positive correlation ($r = 0.409$ $p < 0.001$). Taxpayers who trust government are continuously using the internet applications for their tax practices. Therefore, it might be claimed that increasing rate of easy accessibility to RA services is resulting a additional awareness of the government activities and increasing trust level to the government.

RA Efforts About Introducing Taxpayers` Rights

- "I believe that the taxes which we paid, used correctly by the state" and "Revenue Administration's efforts about Taxpayer rights increases my willingness to pay the tax " have a positive correlation ($r = 0.158$ $p < 0.008$) . Taxpayers, who trust in the government and believe taxes that they pay would be used correctly, think that RA efforts about introducing the rights of taxpayers would increase tax compliance.

Correlations Associated with Accountability and Transparency

- Between the statements of " Knowing where the taxes are spent, would increase the willingness to pay tax in a transparent manner " and "I think, taxpayers have some enforceable rights against the tax authorities" there is a remarkable correlation($r = 0.371$ $p < 0.001$). Taxpayers, who want to know where their taxes are spent, are also willing to have more rights against the government.
- Between the statements of "Knowing where the taxes are spent, increases the willingness to pay tax in a transparent manner " and " More transparent and accountable state is important to take place the taxpayer's rights clearly in the law " have a positive correlation($r = 0.268$ $p < 0.001$). Taxpayers who have paid taxes greatly want more transparent and accountable government. Additionally, they think that the taxpayer's rights should take place openly in law and in the constitution

Tax Justice and Taxpayer Rights

- Taxpayers responds to the statements of "There is a fair taxation system in our country" and "I benefit from RA's Internet applications sufficiently" revealed a strong positive correlation ($r = 0.302$ $p < 0.001$). Those who find taxation system unfair do not use internet applications.

Consequently, it might be claimed that the taxpayers who does not have more information about RA's procedures are finding tax system unfair.

- Between the statements of "I believe that taxpayers, who know their rights correctly, meet with their obligations correctly" and "it is normal to evade taxes under unfairness of tax system" there is a negative correlation($r=-0,185$ $p<0,001$). Taxpayers who are agreed with first statement, think that it is not correct to evade taxes even tax system is unfair.

8. Conclusion remarks

After the declaration of taxpayers' rights charter in 2006 at Turkey, taxpayers' rights are opened for discussion in academic circles and acknowledged as a important factor that encourages tax compliance. After this situation, the paper can be counted as one of the first introducers of this field to international literature and examines awareness of taxpayer rights in Turkey among the income taxpayers in Manisa district. Results of the analysis are showing that the income taxpayers in Manisa has not fully aware of their rights although RA has put some effort on improving the taxpayer rights in recent years. Moreover, the situation can be interpreted as there is a communication failure between RA and taxpayers. As a result, increasing the effort of introducing rights to taxpayers would be a wise advice for RA in Turkey to increase tax compliance. Additionally, tax knowledge has appeared as another influential factor on awareness of taxpayer rights. Although some taxpayers are using the services arising from taxpayer rights, they are failing to identify taxpayer rights in their relations with RA and more educated taxpayers tend to utilize the provided services than others.

Transparency and trust in government appears as another points related with taxpayer rights among income taxpayers in Turkey. Results agreed that increasing transparency and more trust in government are positively affecting awareness of taxpayer rights among taxpayers. Besides taxpayers are aware that the declaration of taxpayers' charter should be supported with enforceable legislation. In other words, taxpayers' rights should be protected precisely by law instead of intentional declarations. Furthermore, constitutional protection should be considered on taxpayer rights in order to pull taxpayers' rights onto a stable and reliable basis that will support the idea of paying taxes as a right instead of duty.

References

- Bentley, D. (1998). "Taxpayers' Rights: An International Perspective", Gold Coast, Qld, Revenue Law Journal, School of Law, Bond University.
- Gerçek A. (2006) "Vergilemede Mükellef Hakları ve Türkiye'deki Durumun Değerlendirilmesi", Vergi Sorunları , number: 209, February
- Gerger G.C. (2011) " Mükellef Hakları ve Vergiye Gönüllü Uyum" Legal Publications, Istanbul
- Goranovic P., (1998)"Taxpayers' Rights and Tax Administration in Montenegro", (online),<http://unpan1.un.org/intradoc/groups/public/documents/nispacee/unpan004534.pdf>
- Greenbaum A. (1998), "United States Taxpayer Bill of Rights 1, 2 and 3; A Path to the Future or Old Wine in New Bottles?"in Taxpayers' Rights: An International Perspective, (Editor: Duncan Bentley), Adelaide: Hyde Park Press,
- Kasipillai, J., Aripin, N. and Afza A.N., (2003) "The Influence of Education on Tax Avoidance and Tax Evasion". eJournal of Tax Research, Vol. 1, No. 2.
- Li J., (1998) "Taxpayers' Rights in Canada" in Taxpayers' Rights: An International Perspective, Editor: Duncan Bentley, Adelaide, Hyde Park Press
- OECD, (1990) "Taxpayers' rights and obligations – a survey of the legal situation in OECD countries", Committee of Fiscal Affairs (online) <http://www.oecd.org/pdf/M00023000/M00023881.pdf>
- OECD, (2008) Tax Administration in OECD and Selected Non-OECD Countries: Comparative Information Series OECD Paris,
- Özgenç, A. S. (2007) "Mükellef Hakları Bildirgesinin Hukuki Niteliği", Vergi Dünyası, Ocak, Ep. 305,
- Wheelwright, K. (1997). "Taxpayers' Rights in Australia", ePublications@bond. (Online), <http://epublications.bond.edu.au/rj/vol7/iss1/10>.
- Yalti B., (2007) "Vergi Yükümlüsünün Hakları" 1. baskı, Beta Yayınları, Istanbul,
- Yucedogru, R. (2007) "Turk vergi sisteminde mukellef haklari", Unpublished MA thesis , Marmara University, Istanbul

Building Sustainable eParticipation Strategies Using Living Labs

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Abstract: The paper explores whether Living Labs, acting as open innovation intermediaries, can address some of the challenges surrounding the sustainable adoption of eParticipation tools and methods. We begin by analysing the existing literature on Living Labs and Open Innovation, and the extent to which Living Labs can act as innovation intermediaries as envisioned by Chesborough (2006), Wolpert (2002) and others. We then consider the research on eParticipation, and in particular some of the risks and challenges surrounding the sustainability of innovation in this area. In the second part of the paper, focusing on the PARTERRE project, we present the methodology and key findings of six eParticipation pilots. Further comments and analysis based on these findings is provided, examining issues such as inter-cultural barriers, technological factors, organisational concerns and participant feedback. Finally, we present some conclusions in the light of the findings.

Keywords: eParticipation, living labs, innovation intermediaries, open innovation, user innovation

1. Introduction

The TRAIL Living Lab, based in the University of Ulster, is focused on the development of user-centred techniques to improve services and product development. As a partner of the PARTERRE project, TRAIL has been piloting new eParticipation technologies within Northern Ireland. The pilots, utilising the Electronic Town Meeting system, have been taking place in partnership with local stakeholders and have addressed a broad range of public policy issues.

In the following sections we consider the role of Living Labs as “innovation intermediaries” particularly in the context of open innovation as defined by Chesborough (2003). We look at the challenges around sustainable eParticipation, including generic issues around embedding innovation within organisations, as well as the specific obstacles that are faced by eParticipation. Finally, we explore the role of Living Labs in supporting sustainable eParticipation in the light of findings from the PARTERRE project.

2. Literature review

2.1 Living labs and open innovation

The concept of the Living Lab originated in MIT, where it was originally developed by William J. Mitchell to involve citizens in urban planning issues (Mitchell, 2003). Within Europe, the idea of involving citizens in innovation and design was subsequently adopted by a number of research groups. The European Network of Living Labs (ENOLL) was formed in 2006, and now includes over 250 Living Labs in its membership. Living Labs often utilise a wide range of innovative tools, techniques and methodologies to enable user engagement. The Living Lab approach changes a process that takes place within a single firm into a process involving a variety of stakeholders with varying areas of expertise.

The distinguishing characteristics of Living Labs from traditional institutions have been described as Value, Sustainability, Influence, Realism and Openness (Bergvall-Kåreborn et al., 2009). The open approach is therefore key, but it also represents special challenges in addressing issues such as intellectual property rights. The Open Innovation model as developed by Chesborough (2003) describes how organisations can manage strategic collaboration with external stakeholders. Suitable appropriation regimes can enable the firm to utilise innovation from external sources, while at the same time creating value by opening up the non-differential parts of its own intellectual property portfolio. This model has attracted increasing levels of attention from both academics and

practitioners. Chesborough's 2003 book gained more than 1,800 citations in just seven years and a wide range of disciplines, including economics; psychology, sociology, and even cultural anthropology have shown interest in it (Huizingh, 2010).

While open innovation can overcome barriers between stakeholders that often form an obstacle in traditional innovation strategies, openness in itself poses difficulties for commercialisation, particularly with regard to ownership and exploitation of intellectual property.

2.2 Living labs as innovation intermediaries

One solution proposed by Chesborough (2006) is that of the "open innovation intermediary". Despite the fact that Chesborough treats that term as if it had been newly "coined", there is a significant amount of research that pre-dates his 2006 book (Galbraith and McAdam, 2010). Literature reviews by Howells (2006), Winch and Courtney (2007) and Amico-Roxas (2010) explore this in some detail, and demonstrate that the term "innovation intermediary" can refer to a range of organisations including brokers, third parties and agencies. While the internet has undoubtedly enabled the growth of many new forms of innovation intermediary, Lichenthaler and Ernst (2008) and others have pointed out that little is known about their performance and that the firms themselves are not very forthcoming about their operation.

Wolpert (2002) defines the key challenge for organisations in the following broad terms: *"How do you break down the barriers to sharing information across companies so you can create more generalized sustainable innovation markets without giving your competitors an advantage?"* He points out that a solution has existed since at least the Middle Ages: that of relying on trusted middlemen to share confidential information without compromising clients' interests. He gives the example of executive search firms, and makes an analogy with "innovation headhunters".

Indeed, it can be seen from a review of the literature that research on innovation intermediaries has been developing since the 1990s (e.g., Bessant and Rush, 1995). As the concept of innovation evolved from the linear model to more complex, networked models, so interest grew in the roles and interactions between various actors. As Stewart and Hyysalo (2008) put it: *"when the producer company lost its position as the privileged source of innovation, it became urgent to understand how the knowledge from a range of actors flowed into the innovation process."* Despite this, they point out that the literature is lacking in terms of a detailed examination of the wide range of intermediaries and intermediation activities that exist in different "ecologies of intermediation".

In this context, and given the importance open innovation approaches to the Living Labs model, we might therefore view Living Labs as a form of "open innovation intermediary" (Chesborough, 2003). It has been noted that Living Labs often act as "innovation facilitators" or "innovation catalysts" (Schurmann et al. 2011, Mulvenna et al., 2010), acting as brokers of the relationship between producers and users, the large firm and its SME partners, or indeed between stakeholders from different sectors – for example the "triple helix" model (Mulvenna et al., 2009). The importance of this function is indicated by research which shows that the most lucrative and novel innovations are often developed by users in order to adapt products to their specific needs (Di Gangi and Wasko, 2009; Thomke and von Hippel, 2002; von Hippel 1998). Furthermore, many high-value products and services involve multiple stakeholders in the innovation process (Lüthje et al., 2005; Morrison et al., 2000).

2.3 Overview of eParticipation

According to Sanford and Rose (2007), eParticipation *"involves the extension and transformation of participation in societal democratic and consultative processes, mediated by information and communication technologies (ICTs)"*. Generally, it is intended to promote and support an engaged citizenship using modern technologies, especially internet-based technologies. Although understanding the emerging field of eParticipation is not straightforward – given the lack of an agreed definition and unclear research boundaries – recent emerging technologies, government reports and academic programmes demonstrate an increasing level of interest in the subject (Sæbø et al., 2008).

It has been observed by Habermas (1996), Van Dijk, (2000) and others that democracy and related political processes depend on effective communication and informed decision-making by citizens, politicians, officers, and other stakeholders. Motivations for governments to promote participation

include improving efficiency and strengthening the legitimacy of political processes. From the other side, citizens, non-governmental organizations, lobbyists, and pressure groups are likely to push for increased participation in order to further their own interests. As technologies have evolved, multiple platforms with the potential to support participation have become available, including social media, chat technologies, discussion forums, electronic voting systems, group decision support systems, and blogs. This combination of motivated actors and improvements in technological infrastructure has resulted in a proliferation of eParticipation projects (Bekkers, 2004; Best and Krueger, 2005; Curwell et al., 2005).

While eParticipation as a term is not yet mature and is still evolving in the literature (Chang, 2005; Dutton et al., 1984; Macintosh and Smith, 2002), it is likely to continue to emerge as a distinctive research area. As Sæbø et al. (2008) point out, many factors point to its growing importance, including government programmes, government reports (Fagan et al., 2006; Jansen et al., 2006), the emergence of companies specializing in eParticipation, and targeted research programs.

2.4 Challenges for sustainable eParticipation

As with any form of innovation, sustainability is a key challenge for proponents of eParticipation – that is, ensuring that the organisational and cultural changes become fully “embedded”. It has been estimated that failed innovation projects cost Fortune 1000 companies nearly \$60 billion annually in wasted development efforts (Atkins, 2010). In the context of current pressures on spending, it is incumbent on both private and public bodies to avoid such waste.

A number of approaches have been suggested in the literature on innovation to address this challenge, for example:

- shifting organisational structures towards customer-driven innovation (Desouza et al., 2008);
- identifying champions of innovation and developing trans-organisational communities of innovation (Coakes and Smith, 2007);
- supporting external collaboration and establishing cultural frameworks (APQC, 2008);
- creating technological niches, i.e. protected spaces that allow experimentation with technology, user practices, and regulatory structures (Schot et al., 2008).

As well as the generic problems that can affect any form of innovation, eParticipation faces its own specific issues. The OECD (Macintosh and Coleman, 2004), a UK local eDemocracy study (Pratchett, 2004), as well as a number of other sources and position papers have identified particular challenges for eParticipation relating to political, organisational, social or technical factors (Wimmer and Kramer, 2006)

Living Labs, acting as open innovation intermediaries by connecting cross-sectoral stakeholders, and maintaining a strong focus on user engagement, may be well-positioned to help organisations deal with such issues.

3. Methodology

3.1 TRAIL living lab

The TRAIL Living Lab, based at the University of Ulster, was the first Living Lab to be established in Northern Ireland, and was invited to be a member of the European Network of Living Labs (ENOLL) in 2007. TRAIL represents the development of the University's research thinking across several key disciplines including business, information & communication technologies, occupational therapy, art, health care, social care and clinical medicine. It supports a diverse set of stakeholders in the development of new technologies, research perspectives, processes and integrated service solutions that deliver real value to users, particularly individuals and communities in the North of Ireland, as well as users across Europe.

TRAIL has adopted the Living Labs approach of supporting partnerships between public and private entities, with the strong involvement of user communities. The Lab is strongly focused on placing people at the centre of service and product development and innovation. As an ENOLL member, it is connected to a powerful innovation network that includes high-tech corporations and global researchers.

3.2 PARTERRE project

The overarching objective of the PARTERRE project is to deploy ICT to enhance the direct participation of citizens, stakeholders and civil society in democratic decision-making processes using two specific electronic tools:

1. The Electronic Town Meeting (eTM), a deliberative democracy methodology and toolset combining small-groups discussion with the advantages of electronic communication. The methodology and toolset have been previously deployed in another Preparatory Action on eParticipation, in partnership with two members of the project consortium, the Region of Tuscany and the Italian consultancy Avventura Urbana.

2. The DEMOS system, which was successfully deployed by one project partner (TuTech Innovation GmbH) in the context of a Preparatory Action on eParticipation, entitled “LexiPation”, and by the coordinating organisation (Regione Toscana) as an evaluation forum for its newly approved law on participation. To address the specific needs of a formal participation process in spatial development the DEMOS system has been refined into DEMOS-Plan which integrates workflows for spatial planning and includes standards-based GIS integration.

The role of TRAIL within PARTERRE focused specifically on trialling the eTM toolset, which is described below.

3.3 Electronic town meeting (eTM) toolkit and methodology

The Town Meeting is a form of structured participation in local government practised in the New England region of the United States since colonial times, and in some Western States since at least the late 19th century. There an entire community was invited by government officials to gather in a public place to formulate suggestions or provide feedback on specific policy issues.

In its modern version - the Electronic Town Meeting – the use of ICT enables citizens to participate either directly or indirectly in the debate. The basic characteristics of an Electronic Town Meeting are as follows: after information on a given topic has been provided, participants can express themselves individually within small groups (typically round tables). Instant minutes of the tables discussions are kept by facilitators - using electronic means – with the aim of enabling opinions and views to emerge from the debate, without any attempt to formulate a unitary (or compromise) vision. A central team (known as the “Theme Team”), composed of domain experts, collects and reviews the minutes, clustering the issues that emerge – with a special eye on conflicting perspectives – and then provides rankings of statements which are finally submitted to a collective vote by all participants. The voting mechanism is typically supported by the provision of numeric keypads to each participant in the eTM. At the end of the day an “Instant Report” is drawn up and distributed to all participants, summarizing the general aims of the debate, the process undertaken and the main results of the work done, particularly issues prioritised through the collective vote.

As a member of the PARTERRE Consortium, the TRAIL Living Lab undertook to pilot the Electronic Town Meeting within Northern Ireland. A series of six pilot events were organised with a variety of external stakeholders to validate the eTM as a means of supporting regional territorial development.

4. Findings

4.1 Presentation of findings

4.1.1 Case study one

Strategy for Allied Health Professionals in Northern Ireland, 12 th August 2011
Discussion themes
Promoting Person-Centred Care Delivering Safe and Effective Care Maximising Resources for Success Supporting and Developing the AHP Workforce

Number and profile of participants
90 (allied health professionals, academics, government)
Key findings
Population demographics and profile are important to understand if you are planning the workforce. Person-centred is the first thing to be dropped when services have been cut. Vision should explain how AHPs bring value to health and social care. Training for all staff is required to enable innovation and motivation. Greater leadership and entrepreneurship taught in undergraduate programme required in order to be better able to maximise resources. Training requirements: economics of how this strategy can be delivered within resources, or on how to manage resources so that AHPs can be more proactive rather than reactive. Health is still politically influenced rather than population led. Coordinated approach between health service and private sectors, especially when DHSSPS put service delivery out to tender and private practice are awarded this work.

4.1.2 Case study two

Open Government – Making Open Data Real, 23 rd September 2011
Discussion themes
An enhanced right to data Setting transparency standards Corporate and personal responsibility Meaningful Open Data Government sets the example Innovation with Open Data
Number and profile of participants
50 (industry representatives, local and regional government, policy-makers, academics)
Key findings
There is a question about what data is relevant to the public. We establish stronger rights for individuals, businesses and others through legislative and regulatory systems. One problem is that of commercial intellectual property (IP) associated with data and this provides reasons for not making data open. Privacy and security are important. Inputting data in a standardised way is hard to control. On all NEW data collection - ask is there any reason why this data shouldn't be shared. Raw data is so vast how do people get a meaning from it? FOI requests are publishable to all in Canada; often (Freedom of Information) FOI requests are similar often duplicated. Record the questions and answer and let it go public. On top of that there should be standards set up on how you publish information. FOI requests are expensive for organisations to collate.

4.1.3 Case study three

Partnerships for Business Innovation – Engaging for Growth, 4 th November 2011
Discussion themes
Awareness and Identifying Need Meeting the Need and Identifying Gaps in Current Provision Identifying Inhibitors for Businesses Seeking to Innovate Overcoming Barriers to Ensure that Engagement Benefits Everyone

Number and profile of participants
60 (SMEs, industry representatives, regional government, policy-makers, academics)
Key findings
Every business has different levels of need, no one size fits all – need a process for the different sectors. Businesses only seek help when they have identified a problem, rather than looking at initiatives which might improve their products. Challenge for businesses is to move from fighting fires to initiating new ideas to expand their markets. Owner managers need support to explore innovation. NI is slow to react because of bureaucracy. Tension between governance / accountability versus flexibility. Businesses are unclear about the advantages of innovation and how to access the knowledge base of the universities and colleges Bureaucracy is a massive barrier that is damaging all parties

4.1.4 Case study four

Worklessness Within North Belfast, 18 th November 2011
Discussion themes
Reflections on Mid-term Review for North Belfast What Works, What Doesn't – What Now? The Impact of Work on Family Life Moving Beyond Generational Worklessness
Number and profile of participants
80 (community representatives, local and regional government, charitable and voluntary sector, policy-makers)
Key findings
Statistics have not changed - gaps in educational attainment remain compared to non-neighbourhood renewal areas. Streaming affects attainment levels - stigma attached to secondary schools. Schools in the area are not skilling children for high-paid employment. Statistics are not improving due to the teaching and the actual schools but that only amounts to 15%. The other 85% is crucial and that is the general environment. Closure of libraries has had an impact on reading levels Parents must be involved. ICT skills are essential but are not compulsory subjects in schools Too many obstacles for small employers to take on staff. Young people from deprived areas will face barriers to University education due to fees. Most people would work if they can but people don't have the skills or education.

4.1.5 Case study five

Maximising Social Value Through Public Sector Procurement, 17 th February 2012
Discussion themes
Development and the Commissioning Process Measuring Social Value Compulsory Competitive Tendering and Social Enterprise
Number and profile of participants
65 (academics, charitable and voluntary sector, procurement practitioners, policy-makers)

Key findings
There is a tension about money first and best value for money. There is little recognition for local NI businesses that contribute to the local economy. Need to look at wider context - what are we aiming to achieve? Corporate Social Responsibility could be weighted more highly in a contract tender. There needs to be distinction between commissioning and procurement. Social value is not the same for every organisation. It is difficult to define social value in financial terms. There are too many models and too many different approaches. There is a problem having different measures - as a commissioner - how to judge between bids if organisations are using different scales.

4.1.6 Case study six

Innovation in Sustainable Construction and Energy Management, 7 th March 2012
Discussion themes
Drivers for Sustainable Construction “Fabric First” design and retro-fit Effective Energy Management
Number and profile of participants
75 (SMEs, large corporates, academics (further and higher education), local and regional government)
Key findings
At present legislation is not forcing houses to be built more energy efficiently. Legislation is only a benchmark at this stage. NI is lagging behind GB in enforcement of legislation. Legislation is a small driver, cost is the main driver. 80% of our housing stock will need to have retrofit applied to them to future proof. Ministers positions changes depending on who is in power While the principle of Passiv Haus delivers an extremely efficient product, the cost of a fully Passiv Haus design is very high - almost unachievable. People want easy methods and methods they can relate to, for instance energy management systems should incorporate text messaging and wireless. Education is vital, we must first understand how much energy is being used.

4.2 Comments and analysis

4.2.1 Cultural issues

It was clear from an early stage that it would not be possible to exactly replicate the Italian eTM model within Northern Ireland, primarily for cultural and demographic reasons. The biggest challenge in implementing the Electronic Town Meeting system in Northern Ireland is in organising larger events. In Italy events of 500-1000 are not unusual; achieving such numbers in Northern Ireland is almost impossible. Firstly, the population is much smaller and more dispersed – Northern Ireland having a comparatively rural population. Secondly, persuading citizens to take a day's leave to attend a meeting on public policy is very challenging, particularly given the political history of Northern Ireland and traditionally low levels of democratic engagement. These issues were identified at an early stage, and the pilots in Northern Ireland therefore focused on more frequent, small-scale, “targeted” events.

Once the pilots were underway, it became apparent that participants within Northern Ireland generally found the experience and outcomes useful, and this was reflected in the participant feedback. Indeed, the experience of the organisers was that each pilot triggered additional expressions of interest from potential user organisations, and that there was overall a significant growth in demand for eTM-related services over the course of the project.

4.2.2 Technology

From the point of view of participants, the hardware and software provided by Regione Toscana generally worked well, providing participants with a discrete, unobtrusive and responsive system for recording their comments and opinions. From organisers' perspective, the technical design of the eTM system meant that a significant amount of time was required in advance of the pilot for the technical "setup" – i.e., the installation of server and client hardware. This was quite technical and time-consuming, and added significantly to the expense of running an eTM. As well as requiring additional time from technical support staff, it meant that the event venue had to be reserved for two days instead of one.

In order to reduce these costs, the TRAIL team experimented with a modified version of the system that enabled the use of wireless "tablet PCs" in place of the wired netbooks and USB keypads that were originally provided. This allowed table facilitators to type comments on the tablet during the discussion sessions, and to pass the tablet round to record votes during the polling sessions. Using this approach, the setup for an event could be completed in approximately 30 minutes, just before the event. Initial feedback from participants indicated that the tablet-based system worked well.

4.2.3 Organisational factors

Some small changes were required to the eTM methodology in order to make the system effective at the smaller scale of the Northern Irish pilots. For example, instead of printing out copies of the "Instant Report", it was found to be more cost-effective to send copies of the report via email. In general, efforts were made by the TRAIL team to keep the cost of running a pilot to a minimum. This was done for two reasons: firstly, to facilitate the running of multiple pilot events within the project scope, and secondly to confirm the feasibility of the eTM system in the context of local market that is unlikely to be able to afford expensive large-scale events.

4.2.4 Other comments

A number of challenges became clear during the pilots in terms of implementing the eTM methodology effectively and ensuring the maximum benefit for participants. In terms of how the system enabled the recording and reporting of discussions, the majority of feedback from participants was very positive. One concern that arose was that the Table Facilitators and Theme Team had a great deal of power to "shape" the reporting of the discussion. In general, participants were keen to be re-assured that the reporting of comments would be fair and inclusive. While polling was generally felt by participants to be a useful aspect of the system, participants tended to be sensitive to the phrasing of questions. In particular, they objected to questions which were perceived to be leading or ambiguous.

The TRAIL team felt that these were important lessons for fine-tuning the eTM methodology, with consequences for the training of eTM implementers. While the system makes it easy to implement a successful event, some skill is required in order to ensure that optimal outcomes are achieved.

5. Conclusion

eParticipation is still maturing as a research field (Chang, 2005; Dutton et al., 1984; Macintosh and Smith, 2002), but is steadily growing in importance as an European policy issue (Sæbø et al., 2008). In order to ensure that investments in this policy area are sustainable, it will be essential to engage users and effectively involve cross-sectoral stakeholders within the innovation process (Desouza et al, 2008; Coakes and Smith, 2007; Schot et al., 2008). Living Labs, while still a relatively new phenomenon, are an increasingly well-established form of open innovation intermediary, with a strong track record of supporting triple and quadruple helix innovation partnerships (Schurmann et al. 2010, Mulvenna et al., 2010). A review of the literature suggests that Living Labs are well-positioned to address some of the key challenges surrounding sustainable innovation in general, and sustainable eParticipation in particular.

The experience of the TRAIL Lab piloting eParticipation technologies within Northern Ireland suggests that there is a useful synergy between the eDemocracy agenda and the user-centric Living Labs model, particularly in terms of cultural values, technologies and methodologies. International linkages enabled by the European Network of Living Labs can facilitate the diffusion of specific innovations, and can also assist in recognising and addressing inter-cultural challenges such as those described in

section 4.3. In conclusion, within Northern Ireland at least the prospect for sustainable eParticipation appears to have been significantly enhanced by the application of the Living Labs model.

References

- APCQ (2008) Successfully Embedding Innovation: Strategies and Tactics; APQC Publications, Houston, Texas
- Atkins, M. (2010) Five Key Concepts for Sustainable Innovation. *Industry Week*, July 2010, Vol. 259 Issue 7, p53-54
- Bekkers, V. (2004). Virtual policy communities and responsive governance: Redesigning on-line debates. *Information Policy*, 9(3/4), 193-203.
- Bergvall-Kåreborn, B., Ihlström Eriksson, C., Ståhlbröst, A., and Svensson, J. 2009. A Milieu for Innovation - Defining Living Labs. Paper read at The 2nd ISPIIM Innovation Symposium - Stimulating Recovery - The Role of Innovation Management, 6-9 December 2009, at New York City, USA.
- Bessant, J. and Rush, H. (1995) Building bridges for innovation: The role of consultants in technology transfer. *Research Policy*, 24: 97-114.
- Best, S. J., & Krueger, B. S. (2005). Analyzing the representativeness of Internet political participation. *Political Behavior*, 27(2), 183-216.
- Chang, W.-Y. (2005). Online civic participation, and political empowerment: Online media and public opinion formation in Korea. *Media, Culture and Society*, 27(6), 925-935.
- Chesbrough H. (2003) Open Innovation. Harvard University Press: Cambridge, MA.
- Chesbrough, H. (2006) Open Business Models. Harvard Business School: Boston, MA.
- Coakes, E., Smith, P., (2007) Developing communities of innovation by identifying innovation champions, *Learning Organization*; 2007, Vol. 14 Issue 1, p74-85.
- Curwell, S., Deakin, M., Cooper, I., Paskaleva-Shapira, K., Ravetz, J., & Babicki, D. (2005) Citizens' expectations of information cities: Implications for urban planning and design. *Building Research and Information*, 33(1), 55-66.
- Desouza, K. et al, (2008) Customer-driven Innovation, *Research Technology Management*; May/Jun2008, Vol. 51 Issue 3, p35-44
- Di Gangi, P.M., and Wasko, M. (2009) Steal my idea! Organizational adoption of user innovations from a user innovation community: A case study of Dell IdeaStorm. *Decision Support Systems* 48 (1):303-312.
- Dutton, W., Steckenrider, J., Rosschistensen, D., Lynch, L., Goldfarb, B., Hirschberg, L., et al. (1984). Electronic participation by citizens in US local government. *Information Age*, 6(2), 78-97.
- Fagan, H., Newman, McCusker, & Murray (2006). E-consultation: Evaluating appropriate technologies and processes for citizens' participation in public policy. Final report from the eConsultation research project. Retrieved July, 2006, from http://www.e-consultation.org/files/ecrp_report.pdf
- Galbraith, B., McAdam, R. (2011) The promise and problem with open innovation, *Technology Analysis & Strategic Management* Vol. 23, Iss. 1
- Habermas, J. (1996). *Between facts and norms: Contributions to a discourse theory of law and democracy*. Cambridge, Mass: MIT Press.
- Howells, J. (2006) Intermediation and the role of intermediaries in innovation. *Research Policy*, 35(5): 715-28.
- Huizingh, E., (2011) Open innovation: State of the art and future perspectives, *Technovation*, Volume 31, Issue 1, Pages 2-9
- Jansen, G., Dowe, C., & Heimann, U. (2006). Facilitating active citizenship, E-participation in UK and Germany. Berlin: British Council Germany Retrieved January, 2007, from http://www.britishcouncil.de/e/society/e_participation.htm
- Lichtenthaler, U. and Ernst, H. (2008) Intermediary services in the markets for technology: Organizational antecedents and performance consequences. *Organizational Studies*, 29: 1003-38.
- Lüthje, C., Herstatt, C., and von Hippel, E. (2005) User-innovators and "local" information: The case of mountain biking. *Research Policy* 34 (6):951-965.
- Macintosh, A. & Coleman, S. (2004) Promise and Problems of E-Democracy, Challenges of online citizen engagement, OECD
- Macintosh, A., & Smith, E. (2002). Citizen participation in public affairs. In R. T. a. K. Lenk (Ed.), *EGOV 2002* (Vol. LNCS 2456, pp. 256-263). Berlin: Springer-Verlag.
- Mitchell, William J. (2003) *Me++ : the cyborg self and the networked city*, MIT Press, Cambridge, Mass.
- Morrison, P.D., Roberts, J.H., and Von Hippel, E. 2000. Determinants of User Innovation and Innovation Sharing in a Local Market. *Management Science*, 13-15.
- Mulvenna, M., Bergvall-Kåreborn, B., Galbraith, B., Wallace, J., Martin, S., (2010) Living Labs Are Innovation Catalysts, *Innovation through Knowledge Transfer*, Springer Berlin Heidelberg
- Mulvenna, M., Galbraith, B. and Martin, S. (2009) Enriching the Research & Development Process Using Living Lab Methods: The TRAIL Experience. *eChallenges-2009 Conference Proceedings*,. (Eds: Cunningham, P and Cunningham, M), IIMC International Information Management Corporation, pp. 63-71.
- Pratchett, L. (2004) Barriers to e-Democracy, Local government experiences and responses, <http://www.icele.org/downloads/Researchreport.pdf>
- Sæbø, Ø., Rose, J., Flak, L. (2008) The shape of eParticipation: Characterizing an emerging research area, *Government Information Quarterly*, Volume 25, Issue 3, July 2008, Pages 400-428.
- Sanford, C. and Rose, J. (2007) Characterizing eParticipation, *International Journal of Information Management*, Volume 27, Issue 6, December 2007, Pages 406-421.

- Schot, J., Geels, Frank W., (2008) Strategic niche management and sustainable innovation journeys: theory, findings, research agenda, and policy. *Technology Analysis & Strategic Management*; Sep2008, Vol. 20 Issue 5, p537-554.
- Schuurman, D., De Moor, K., De Marez, L., Evens, T. (2011) A Living Lab research approach for mobile TV, *Telematics and Informatics*, Volume 28, Issue 4
- Stewart, J. and Hyysalo, S. (2008) Intermediaries, user, and social learning in technological innovation, *International Journal of Innovation Management*, 12 (3) (2008), pp. 295–325
- Thomke, S., and von Hippel, E. (2002) Customers as Innovators: A New Way to Create Value. *Harvard Business Review*, Harvard Business School Publication Corp.
- Van Dijk, J. (2000). Models of democracy and concepts of communication. In K. L. Hacker, & J. Van Dijk (Eds.), *Digital democracy, issues of theory and practice*. London: Sage publications.
- von Hippel, E. (1998) Economics of product development by users: The impact of 'sticky' local information. *Management Science* 44:629-644.
- Wimmer, M.A. & Kramer, A. (2006) Deliverable 1.1: "Challenges and Barriers of eParticipation Research and Practice", Retrieved March 2011 from http://www.demo-net.org/what-is-it-about/research-papers-reports-1/demo-net-deliverables/pdfs/DEMO-net_D1.1.doc.pdf
- Winch, G. and Courtney, R. (2007) The organisation of innovation brokers: An international review. *Technology Analysis & Strategic Management*, 19(6): 747–63.
- Wolpert, John, D. (2002) Breaking Out of the Innovation Box, *Harvard Business Review*; Aug2002, Vol. 80 Issue 8, p76-83.

Increased Public Participation in Local Government Through the use of Mobile Phones: What do Young South Africans Think?

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Abstract: Apathy towards political participation is of concern for many countries throughout the world, and for many people political participation means no more than voting in an election. The South African Constitution makes several provisions for public participation but eGovernment solutions are not suited to the South African context, where fixed-line internet penetration is dramatically lower than that of mobile phones. Mobile phones cut across socio-economic barriers and have changed the way we communicate. They have been used to mobilise people in different parts of the world, notably those who were passive politically, into action. This research set out to investigate whether using mobile phones to increase participation in local government would be acceptable or not. A mixed-method research was conducted in Cape Town, South Africa, amongst citizens between the ages of 18 and 35 who had no access to fixed-line internet from either home or work. Constructs from a modified UTAUT model and Social Capital Theory were used to determine the individual intention to use government mobile services if they were made available. It was found that there is not only great interest in using mobile phones to interact with government mobile services, but also to interact with other members of the community. The ability to report on corruption and service delivery problems was particularly welcome.

Keywords: m-Participation, m-Government, mobile technologies, South Africa, youth

1. Introduction

There is a worldwide apathy towards political participation, even in developed countries such as Switzerland and the United Kingdom (UK), which have shown a decline in voter turnout over the last few decades (Brücher & Baumberger, 2003). Governments around the world have introduced initiatives to include citizens in the decision making process. There are many ways in which citizens can participate in government in an on-going way; however, most citizens only interact with government during elections (Pahad, 2005). Public participation is necessary to ensure that citizens are able to influence the decision-makers in government, especially in situations where the decisions taken affect their lives directly (Creighton, 2005).

Decentralising and encouraging more citizen participation requires adequate mechanisms for engagement. The constitution of South Africa has been hailed by many as the most progressive in the world, and makes specific provision for public participation. Section 152 of the Constitution speaks of democracy, accountability, and the encouragement of involvement in matters of local government. Section 16(1) of the local government municipal systems Act 32 of 2000 echoes this need for, and encouragement of, participation in local matters and adds that local government should do whatever it can to facilitate this process (Constitution of the Republic of South Africa, 1996, 2009).

Mobile phones are usually used as communication tools, but they have also been used by ordinary people to mobilise others, who were previously passive, into political action, as evidenced for example by the Arab spring. What has eluded governments is how to fully utilise the capabilities of mobile phones to reach almost every citizen, and in so doing possibly reverse the increasing political apathy amongst their citizens (Hermanns, 2008). This research explores the factors that could influence the use of the mobile phones as a political participation tool.

2. Literature review

2.1 Democracy and participation

Participatory democracy models are based on the belief “that the very act of involvement is beneficial in that it permits all citizens, and not merely elites, to acquire a democratic political culture” (Deegan, 2002, p. 45). Participation is an important part of any modern democracy, even though many citizens believe that their only influence over government lies in their ability to occasionally cast their vote (Creighton, 2005). Not encouraging and allowing for participation limits a government’s sources of options and ideas and also exposes the democratic process to corruption, which would otherwise be

addressed through public scrutiny if citizens were more involved (Creighton, 2005). Public participation should not just be viewed as participation in events, such as elections, protests or demonstrations, but rather as an on-going and evolving process that requires as much change in public perceptions and mind sets as it requires government to commit to exploring new systems of participation.

According to Mattes (2002), South Africans are passive when it comes to community involvement. In a study comprising over 2 200 respondents, only 4 indicated that they made any attempts to, “attend any hearing or meeting organised by parliament or by an MP” (Mattes, 2002, p. 33). There is therefore a need for other approaches to not only monitor participatory processes, such as the status of requests made to local councillors, but also new ways in which to disseminate information (Nyalunga, 2006). Giving citizens the ability to track what councillors are doing between elections is important for both citizens and government and could not only improve accountability, which is stipulated in Section 152 of the constitution, but also provide citizens with valuable knowledge which could help them evaluate their local councillor in the run-up to local elections.

2.2 M-government

In South Africa, as in many developing countries, traditional eGovernment can be said to widen the gap between “haves” and “have-nots”, since the poor and disenfranchised typically have no access to fixed internet. However, m-government entails the distribution of government services through/by means of mobile technologies (Carroll, 2005). The potential of m-government, enabled by the ubiquitous mobile phones, is to provide services, especially to previously disadvantaged groups, as well as to provide new mechanisms for public participation in politics (Poblet, 2011). However, this requires the creation of applications that leverage the appropriate mobile technology to create useful government services (Patel & White, 2005; Poblet, 2011). The innovation would be to take advantage of “the most basic capacities of already existing technologies to reach broader population segments which otherwise would not have had access to more costly and sophisticated mobile technologies” (Poblet, 2011, p. 503).

Traditionally, citizens who want to engage in dialogue with government in ways such as gaining information, discussions, public hearings, or voting, are required to be physically present (Brücher & Baumberger, 2003), which poses practical problems for many, such as inconvenient times or locations. In their review of government call centres, another existing medium for participation, Patel and White (2005), cite factors such as call cost, limitations on ‘open’ hours, and insufficient resources as reasons for their failure. They also cite the problems of queues (which could translate into loss of income for citizens), limited office hours, and resource restriction compared with government enquiries desks or information centres, as points of contact. This highlights the need for governments to explore different ways to interface with citizens, not only in the provision of information, but also to engage in dialogue.

Many government services are procedural or bureaucratic in nature, such as notifications of status changes in identity document requests, or the confirmation of actions and are thus suited to m-government. Vincent and Harris (2008) cites examples in Lewisham, and Hillingdon, in the United Kingdom where mobile text services relay information such as employment opportunities, events, and “food safety warnings”. Citizens are allowed to request garbage removal, upload photographs of problems such as potholes, or to report broken lights.

Mobile users already engage in a wide range of participatory activities such as reporting traffic congestion, entering competitions, taking and distributing photographs, or spreading news of different events (Vincent & Harris, 2008). Mobile phones have contributed to greater awareness and interest in politics, and have proven to be an effective tool in facilitating information sharing between “a large number of similarly minded people within a short period of time and at short notice (Hermanns, 2008, p. 79). Mobile phones have definitely created new ways in which citizens can participate, and can deliver applications that address the need for “innovative ways of popular participation” (Nyalunga, 2006, p. 5).

The current potential of mobile phones as a platform to encourage participation is without question, but there are concerns around personal privacy and security, if they were to be used to report on corruption, or criticise government (Poblet, 2011). However, South Africa has some experience in this regard with its award-winning 32211 SMS tip-off crimeline (SAinfo, 2010). In this case, anonymity is

guaranteed, not by government or the police, but by private enterprises. The initiative was spearheaded by and is supported by private enterprise, and possibly this 'buffer' between them and government gives citizens the necessary 'comfort' to freely express their opinion. The promise that personal information will not be passed on to the authorities has been enough for citizens, and since its launch in 2007, the crimeline has resulted in over 1000 arrests, as well as the seizure of over R36 million (SAinfo, 2010).

3. Research methodology

The objective of this research is to investigate what young South Africans think about interacting with government via their mobile phone. More specifically:

- To determine the level of interest in mobile influencing factors on the intention to engage in m-Participation.
- To establish what form of participation would be desired : informational(G2C), polls/voting, feedback/commentary(C2G) and citizen contact (C2C)

3.1 Theoretical framework

To pursue the first objective, key influencing factors for m-Participation are required. Technology adoption models are typically used to determine the levels of intent to use and acceptance of new technology (Venkatesh, Morris, Davis, & Davis, 2003). Venkatesh et al. consolidated different acceptance models into the Unified Theory of Acceptance and Use of Technology (UTAUT). This model incorporates elements of Theory of Reasoned Action, Theory of Planned Behaviour, Technology Acceptance Model, the Motivational Model, the Model of PC Utilisation, the Innovation of diffusion Theory, and the Social Cognitive Theory, which have all previously been used to determine IT acceptance. The UTAUT model was chosen for this study because it has been shown to be more accurate as a predictor of acceptance and adoption than any of the other adoption models used in isolation (Venkatesh et al., 2003).

However, since this research investigates the potential user Perceptions regarding m-government, and Behavioural Intention (BI) to use mobile phones to interact with government, some parts of the UTAUT model were not considered, and the diagram below shows the modified model used in this research. Both User Behaviour (UB) and Experience are excluded, as there is no widespread availability of government mobile services, and therefore no current use of mobile phone government services in South Africa. In the context of this research, the use of mobile phones to interact with government would always be voluntary, so the Voluntariness of use as a moderator is also excluded. The construct of Facilitating Conditions was also removed, as it affects only UB which was removed, but not BI. The Social Influence (SI) construct has been shown to have a notable effect on BI. The following hypotheses related to the first research objective are directly adapted from the UTAUT model:

H₁: Performance expectancy (PE) will have a positive influence on the behavioural intention to use mobile phones as a medium for political participation. This influence is moderated by gender and age: it has a (stronger influence for men and younger users).

H₂: Effort expectancy (EE) will have a positive influence on behavioural intention to use mobile phones as a medium for political participation. This influence is hypothesized to be stronger for women than for men.

H₃: Social influence (SI) will have a positive influence on behavioural intention to use mobile phones as a medium for political participation. This influence is moderated by gender and age.

Some constructs from Social Capital Theory (SCT) were also incorporated in the survey instrument and interview protocol. SCT deals with trust networks, such as those which exist between friends, family, churches, clubs, and other community and social groups, which individuals can use for personal gain or assistance, or to promote a group agenda (Putnam, 2000). The relationship between the networks is described through the concepts of bonding, bridging, and linking. Bonding refers to close, personal relationships between homogenous groups. Bridging refers to relations between heterogeneous groups, such as associations across differences such as ethnicity or religion. The links

are sometimes referred to as ‘strong ties’ for bonding relationships, and ‘weak ties’ for bridging relationships.

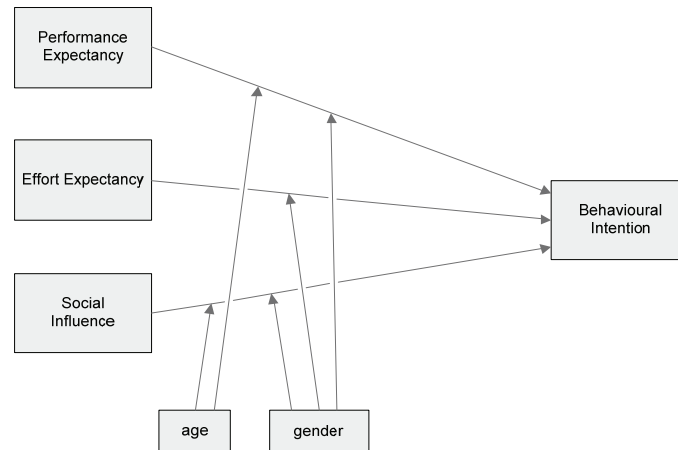


Figure 1: Modified UTAUT model

3.2 Research philosophy, sampling approach and instrument

The underlying philosophy for this research is positivist, as it attempts to determine what drives the use of mobile phones in political participation partly by validating the hypotheses of the UTAUT model. The research strategy was mixed-method: it employed a survey to capture data for quantitative analysis and semi-structured interviews to collect qualitative data. The analysis of the qualitative data offers improved clarity on some of the correlations found during the quantitative data analysis. The research is also cross-sectional, as data was collected over a period of four weeks beginning in the first week of July 2011. The target population consisted of young people between the ages of 18 and 35 years, who did not have access to fixed-line internet from either home or work. Those who had infrequent access to fixed-line internet via facilities such as public libraries were allowed to participate in the survey. A convenience sampling approach was adopted, because of the ease of access to participants.

The survey instrument included some demographic questions some test items from the UTAUT model to measure intention to use technology, some questions regarding individual perceptions of politics, as well as some elements of social capital theory. Most questions adopted a 5-point Likert answer scale from strongly agree to strongly disagree. To be as inclusive as possible, the English instrument was translated into Afrikaans and Xhosa; and Xhosa-speaking facilitators were used in the interviews. The questionnaires are available from the authors on simple request. The data collected was retrieved from people in factories, churches, taxi ranks, a fast food outlet, and office buildings. Survey respondents were not asked where they lived, and data was collected from a variety of areas, including the Cape Town city centre, Khayelitsha, Westlake, Claremont, Hanover Park, Belhar, Charlesville and Retreat. A total of 131 usable questionnaires were available for data analysis. Respondents had capable mobile phones, all but two being Java enabled and all but one internet enabled, confirming the far-reaching trend towards smart phones. Although home language was captured and is referred to, it is in no way implied that it is a proxy for race.

In addition, four people (two of each gender) were interviewed in order to gather supplementary qualitative insights. The semi-structured interview protocol contained open-ended questions to encourage subjective opinions and casual prompting by the researcher also allowed for a more conversational process. When mentioned in the analysis, participant citing for the interview respondents is as per table 1.

Table 1: Interview participant profiles and reference

Code	Gender	Age	Current	Future phone	Area
F1	F	24	Nokia X3	Blackberry	Hanover Park
F2	F	27	iPhone 4	-	Moved to Westlake from Khayelitsha
M1	M	34	Blackberry	Blackberry	Belhar
M2	M	20	Samsung	Blackberry	Belhar

As demonstrated below, most of the comments made at the interviews confirmed the findings from the survey and supported the majority views. Thus, the quotes given below are generally added to give 'colour' to the survey data. In a few cases, more in-depth explanations or divergent views were uncovered (e.g. 5.2, 5.5 below).

4. Influencing factors on m-participation

The modified UTUAT model was used to determine the Behavioural Intention (BI) to use a mobile phone to interact with government. Performance Expectancy (PE) was broken down into two constructs: (General) Convenience and Convenience specifically for M-Government of Mobile Technologies. Effort Expectancy consisted of 4 constructs: Clear & Easy to Use, Costs, Device Form Factors and User Proficiency. Like PE, Social Influence (SI) was broken down into a more generic construct relating to "Some people I know" and one referring specifically to people important to the respondent. All Cronbach Alpha reliability coefficients for the multiple test items were in the range 0.66-0.83.

Multiple regression analysis was used to determine the degree of influence each of the variables have on BI. Some of the PE and EE variables are significantly related to BI, as explained in the hypotheses analysis below. The variables used in the multiple regression explain 46.5% ($r^2 = 0.465$) of the variance in the intention to use mobile phones to interact with government.

H₁: Performance expectancy will have a positive influence on the behavioural intention to use mobile phones as a medium for political participation.

The multiple regression analysis shows a highly significant and positive ($p = 0.007$, $\beta = 0.260$) relationship between the variables PE(Government Mobile Convenience) and Behavioural Intention. There is therefore strong evidence against the null hypothesis and it is therefore rejected. However, neither of the categories age or gender was found to have a moderating influence.

H₂: Effort expectancy will have a positive influence on behavioural intention to use mobile phones as a medium for political participation.

The multiple regression analysis supports an extremely significant and positive ($p < .000$, $\beta = 0.375$) relationship between the variable EE (Proficient) and Behavioural Intention. This is strong evidence against the null hypothesis, and the result supports the hypothesis that Effort Expectancy is a predictor for Behavioural Intention. Over 67% of respondents indicate that they expected that they would become very good at using their mobile phone to interact with government. However, gender does not moderate the relationship between effort expectancy and behavioural intention in a statistically significant way.

H₃: Social influence will have a positive influence on behavioural intention to use mobile phones as a medium for political participation.

The multiple regression analysis finds no statistically significant relationship between any of the SI variables and Behavioural Intention. It was thus not necessary to test the moderating impacts of gender or age. In any case some found the moderating impacts on SI to be only significant in environments where use is not voluntary (Venkatesh et al., 2003).

The drivers of behavioural intention in the modified UTAUT model include PE and EE factors, both exhibiting positive and significant relationships with BI. That social influence has no effect on behavioural intention was expected, as social influence has only been shown to have an effect within non-voluntary environments.

From this it can be concluded that the respondents perceive government mobile services to be potentially useful and expect that they would add value to their lives. They also have the perception that, not only would these services be easy to use, but also that they would easily become proficient in using them. It can be concluded that the expectation is that the user interface of government mobile application or services would be very user friendly. Failure to meet this expectation would affect the Behavioural Intention and ultimately the use of the services or applications.

5. Levels of participation

5.1 Receiving Information via a mobile phone

As mentioned at the end of the last section, the current methods of interacting with government services have both time demands and financial implications for citizens. In the literature, Patel and White (2005), cite problems in government call centres, enquiries desks or information centres and services. F1 describes a process that took both her and her mother three days to resolve at the SARS offices. This meant that both had to take time off work, which translates into a loss of income in addition to the costs incurred by the process.

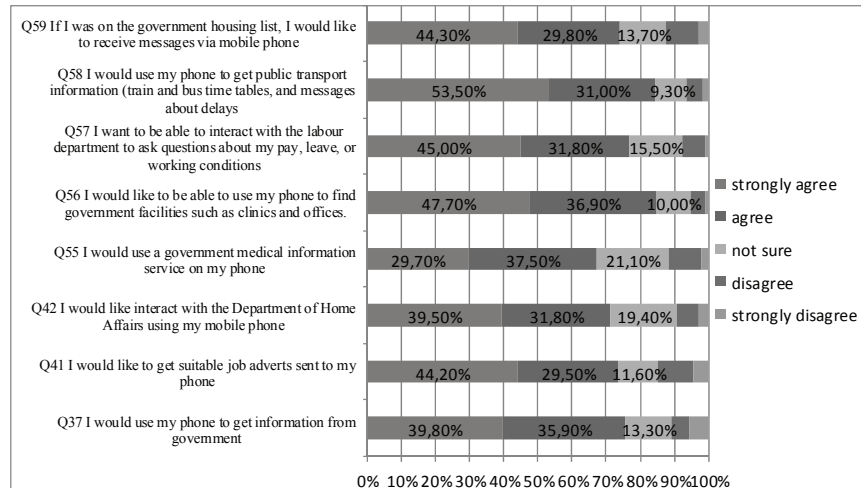


Figure 3: Preferences for receiving government information via mobile phone

Participants respond positively (strongly agree = 39.8%, agree = 35.9%) to the general statement about using their mobile phone to get information from government departments. For most South Africans, there is a great dependence on public transport and this is linked to their livelihood. There is an overwhelming 85% who show interest in using mobile phones as a medium of interaction, both for receiving public transport information, and for finding government offices and clinics: *“if there’s a department of labour in Wynberg and stuff like that. If I need to know where to find which offices...nearest to my community”* (F2).

There are also notification services whereby citizens are informed of the status of their requests. These are triggered by an event such as the application for a new identity document. An example of a service that offers value and is well received by citizens is the SMS notification service offered by the South African Department of Home Affairs: *“Their services are very quick: when I applied for a passport...alerting me about picking up my passport via / through Home Affairs, which was...quite good”* (M1).

There are also positive responses to the other questions on receiving messages in other situations, for example if a person is on the housing list and for medical information, as well as, for job vacancies. In other cases, information could be ‘pushed’ to citizens, such as the broadcast of ‘food safety warnings’ in the UK.

5.2 Voting

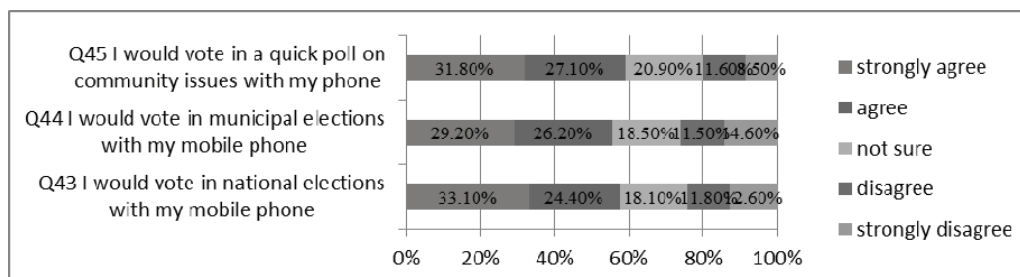


Figure 4: M-voting preferences

When asked about voting, respondents indicated that they would be interested. Quick polls on community issues feature strongly, with 58.9% (strongly agree = 31.8%), and are very closely followed by voting in national and municipal elections. This interest in using mobile phones to vote is echoed by interview participants, some expressing reasons why they would want to vote via a mobile phone: *“national, because the lines are still too long”* (F1); *“I would vote on community issues”* (F1); *“it would be nice to like vote on things. Have [...] voting polls and use your cell phone to do all of that.”* (F2)

Although platforms for voting exist, Hermanns (2008) warns against conflating voting in a political election with quick polls – which are similar to voting on a reality television show. This warning finds traction in the following statement: *“you can vote for your Idol on MxiT [a hugely popular South African Mobile Instant Messaging platform] . There’s so many other things on MxiT, so why not vote things in your community on MxiT”* (M2).

5.3 Reporting service delivery, corruption and community problems

Writing letters, sending SMSs or attending public meetings are some of the ways in which citizens can express their views. The few that do have access to the internet, post comments onto websites, or write blogs.

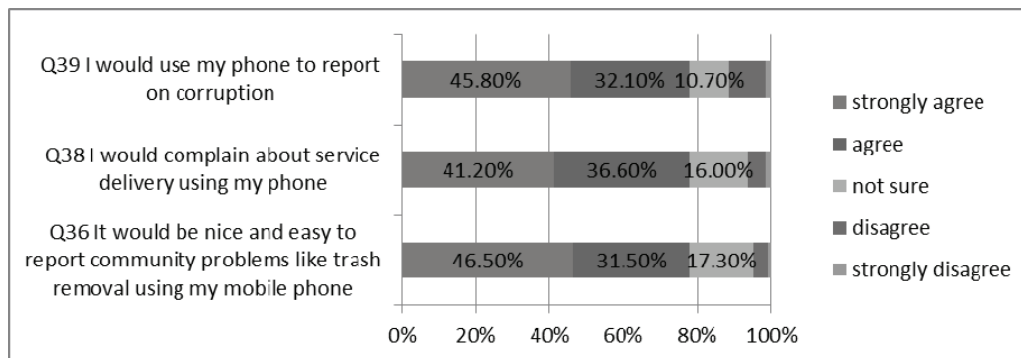


Figure 5: Reporting on service delivery and corruption

The results show strong agreement to all three questions, indicating a desire to inform and report. Service delivery issues could be approached from a more positive and proactive perspective, where posts would serve to inform rather than to apportion blame: *“[it] would be a good idea to use a cell phone, so that they can be informed and also know on their services where they can maybe, they can pick up...improve on their services”* (M1)

In relation to service delivery, M1 implies that an ‘informing’ service could be used by government to track, and improve on inefficiencies in this area. Accessing input from the community could also allow government to make better decisions. 78% of respondents answered positively when asked if they would like to report community problems, such as the lack of trash removal, using their mobile phone, which is an indication that a service with features, such as those in SeeClickFix (<http://seeclickfix.com>), would be a good starting point.

Reporting also raises the issue of anonymity. Interviewees give mixed responses when asked whether or not they would rather be anonymous or not when reporting: *“rather remain anonymous ...but at some times ...I don’t think it would be a big thing...for them to know who it is”* (M2) The option to be anonymous is therefore crucial, especially when reporting on service delivery and corruption, as the fear of being identified would reduce the incidence of reporting.

5.4 Community Interaction

There are many different reasons why people don’t interact as a local community, but mobile phone technology could be used to allow for more such interaction.

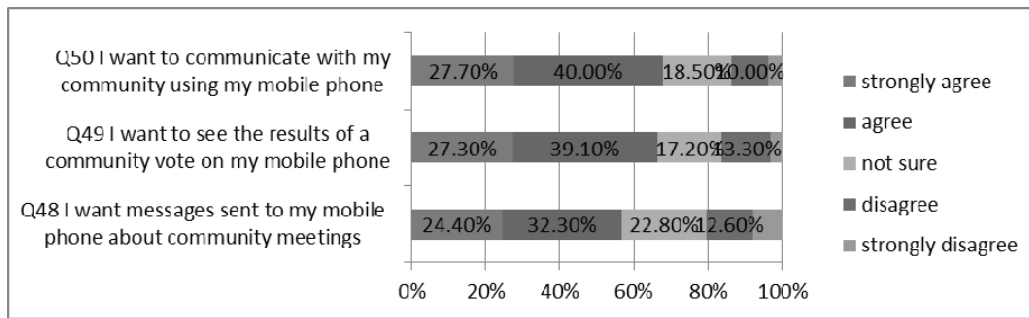


Figure 6: Community interaction

The response to the statement, "I want messages sent to my mobile phone about community meetings", is positive. One of the interview participants relates a situation where information or event notifications sent via a mobile phone would be helpful when making public announcements about upcoming public meetings. *"It would be like very helpful, because sometimes you ... don't know what is going on. You have no idea what people are saying, or if there's a meeting and stuff. Or you missed the time when the guys are shouting like, there's a meeting at 7 o'clock."* (F2).

5.5 Areas of concern

Respondents were also probed regarding a number of possible barriers to or areas of concern about the use of m-government, namely the issues of trust and privacy, as well as that of cost.

Somewhat worryingly, the majority of respondents do not trust the government (32% do *not* trust the government and a further 30% are unsure). Furthermore, only 41% of survey respondents expect the government to protect their privacy during their mobile interactions. This spread of views is supported by the different comments of the interview participants: *"I don't trust them"* (F1) versus *"I do trust the government"* (M1).

In South Africa, as a developing nation, cost (or affordability) remains an important concern for all mobile interactions, especially considering historically high costs of mobile telecommunications. Interestingly, however, the number of respondents prepared to communicate with government via mobile phone remains the same (79%), regardless of whether the service would be free or low cost. In the interview, it became clear that respondents are fully conscious of the potential cost saving. At first, F1 is adamant that she is not going to incur any costs: *"I don't want to. I would use my airtime"* (F1) but, after some further discussion, she realises that *"I would save taxi money"* (F1). Other interview participants are not overly concerned, saying that cost is relative to use *"Not much for me...If there is something you need to check online...you, won't need to go like every day to check government stuff online."* (F2). *"Cost wise, if the cost was reasonable, then I would, yes, want to send an sms"* (M1)

M2 suggested the use of the Mxlt platform (a low-cost Mobile Instant Messaging platform). *"If they can bring it to Mxlt everyone can access it for next to nothing, like 2c and then surely no one would complain about cost."* (M2). The literature supports this, with Chigona and Chigona (2008) citing Mxlt as the ideal platform to communicate with the youth, due to its widespread adoption. There are other MIM platforms that are also widely used, such as BBM (Blackberry Messaging), as well as WhatsApp.

6. Implications for government

The survey presented a list some government mobile services. The introduction of some these services would be a very good starting point upon which others could be built. High on the list was a public transport information service where citizens could access bus and train timetables, as well as receive warnings of delays or cancellations. There was also keen interest in being able to locate government clinics or offices, communication with the Department of Labour, as well as receiving job ads. The list of services could be extensive, and interview participants mentioned some other G2C and C2G services that they would like to see: *"criminal, crime reports"* (F2); *"I would like to inform the police about crime"* (M1); *"I would report over full taxis."* (F1)

M-government services would not only be easier to create, but would also be met with the least amount of resistance when compared to m-democracy applications. As mentioned before, voting may

raise concerns around secrecy, privacy, and security. Far easier to implement and less likely to raise the same concerns, are 'quick polls'. Initially, it can be used as an effective way for a local councillor or for citizens to quickly gauge community opinion on a variety of issues.

The high interest in wanting to report service delivery and corruption, and the lack of trust in government is evident from this research, which indicates that the level of social capital between government and ordinary citizens is extremely low. However, reporting and monitoring services could potentially be problematic. The problem is not of a technical nature, but that of politics. The increased transparency, as well as exposure to public scrutiny of some processes, could possibly curtail the incidence of tender irregularities, endless service delivery complaints and corruption. The tables would be turned, and seemingly paradoxically, citizens could become 'big brother'. Many politicians may not be comfortable with being continually questioned and having their every move subject to public scrutiny.

7. Conclusion

Although the Constitution of South Africa supports political participation, the mechanisms currently provided still prohibit many from interacting. Mobile phones are an integral part of everyday life for many people: "*My whole life is on there*" (F1). The widespread acceptance and adoption of mobile phones in South Africa makes them the perfect vehicle for citizen interaction with both their community, and government. One interview participant sums it up as follow: "*if the youth access it [government] through their mobile phones it will be so much easier, so much quicker, [be]cause it'll be convenient*" (M2)

Of all the UTAUT variables tested, the only two statistically significant drivers for the intention to participate in M-government were found to be the Performance Expectancy construct relating to the *convenience* of using the mobile device and the Effort Expectancy construct of the user's *proficiency* with the device. This finding is reminiscent of the parsimony of the original Technology Acceptance Model.

There is great interest in the specific G2C and C2G mobile services mentioned in the survey and this is possibly a reflection of the respondent perception that these services would offer personal value. Brücher and Baumberger (2003) noted that services have to offer value to ensure widespread use. Although there does appear to be some interest in voting using mobile phones, voting via mobile phone is likely to be controversial, with concerns over secrecy, privacy, and trust. Trust in the system is best built over time as citizens become familiar with the systems as they use other G2C and C2G services.

Respondents also expressed interest in being able to report on service delivery and corruption, as well as communicate with their community and councillor. Mobile phones could serve to empower citizens and give them the ability to access information, report and communicate easier than before. Some considerations for future research are to expand the sample, not only to increase the socio-economic representativeness and size of the sample, but also to include other age groups. Additionally, the research could focus on services people want or need; in addition to the typical government information services offerings, one could conduct focus groups to get a list of services that citizens really want.

Acknowledgements

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References

- Brücher, H., & Baumberger, P. (2003). Using Mobile Technology to Support eDemocracy. *Proceedings of the 36th Hawaii International Conference on System Sciences*. 5, p. 144b. Hawaii: Hawaii International Conference on System Sciences.
- Carroll, J. (2005). Risky Business: Will Citizens Accept M-government in the Long Term? In I. Kushchu, & M. H. Kuscü (Ed.), *Proceedings of the Euro mGov* (pp. 77-87). Brighton, UK: Mobile Government Consortium International Publications.
- Chigona, A., & Chigona, W. (2008). Mxit up in the media: media discourse analysis on a mobile instant messaging system. *The Southern African Journal of Information and Communication*, 9, 42-57.

- Constitution of the Republic of South Africa*, 1996. (2009, July 21). Retrieved March 20, 2011, from South African Government Information: <http://www.info.gov.za/documents/constitution/>
- Creighton, J. L. (2005). *The Public Participation Handbook : Making better decisions through citizen involvement*. San Francisco: Jossey-Bass.
- Deegan, H. (2002, March). A Critical Examination of the Democratic Transition in South Africa: The Question of Public Participation. *Commonwealth & Comparative Politics*, 40(1), 43-60.
- Hermanns, H. (2008). Mobile Democracy: Mobile Phones as Democratic Tools. *Politics*, 28(2), 74-82.
- Jarvenpaa, S. L., & Lang, K. R. (2005). Managing the paradoxes of mobile technology. *Information Systems Management*, 22(4), 7-23.
- Mattes, R. B. (2002, January). South Africa: Democracy without the people? *Journal of Democracy*, 13(1), 22-36.
- Nyalunga, D. (2006, December 1). *An enabling environment for public participation in local government*. Retrieved March 23, 2011, from Democracy Development Program Web site: <http://www.ddp.org.za/information-material/articles/>
- Pahad, E. (2005, July 1). Political Participation and Civic Engagement. *Progressive Politics*, 4(2), pp. 21-26.
- Patel, I., & White, G. (2005). M-government: South African Approaches and Experiences. In I. Kushchu, & M. H. Kuscu (Ed.), *Proceeding of the EURO mGOV 2005* (pp. 313-323). Brighton: Mobile Government Consortium International Publications.
- Poblet, M. (2011, February 1). Rule of Law on the Go: New Developments of Mobile Governance. *Journal of Universal Computer Science*, 17(3), 498-512.
- Putnam, R. D. (2000). *Bowling Alone: The Collapse and Revival of the American Community*. New York: Simon & Schuster.
- SAinfo . (2010, August 27). *Crime Line wins international awards*. Retrieved May 1, 2011, from SouthAfrica.info: <http://www.southafrica.info/news/crimeline-270810.htm>
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3), 425 – 479.
- Vincent, J., & Harris, L. (2008, April). Effective use of mobile communications in eGovernment: How do we reach the tipping point? *Information, Communication & Society*, 11(3), 395-413.

Managing eGovernment Information Resources Using Faceted Taxonomy

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Abstract: The rapid development of information technology in recent years has caused a severe increase in the amount of communication between citizens and government, which led to a considerable upsurge in the volume and complexity of information in eGovernment systems. As a result, structuring information has become a critical topic. When considering structuring information in eGovernment systems, it is important to have in mind two very important processes in the work of eGovernment: analyzing current situation and decision making. For successful completion of these processes, holistic understanding of the situation is necessary. This paper proposes a model that will ease the process of analyzing current situation and the process of decision-making, by providing a holistic view of the situation to the employees in eGovernment. The model effectively manages information and endows decision makers, and other employees in eGovernment, with relevant pieces of information. It also facilitates the understanding of relationships between different pieces of information in the system. The model is based on faceted taxonomy. Faceted taxonomy represents a set of taxonomies, each one describing the domain of interest from a different, preferably orthogonal, point of view. Faceted taxonomy allows rich information structuring and allows users to easily correlate concepts and explore correlations between these concepts. This approach can also provide an intuitive, hierarchical, visual representation of relations between concepts. Visual representations can help better understanding complex topics. The model provides a strong foundation for further development of visualizing techniques. Using this model can also improve all search and browsing methods on the information in the system, and allow easy transformations on the structure. This paper clarifies the criteria selection process for the taxonomies used in the model and provides guidelines for practical implementation of the model. The model also offers recommendations for further exploration of this field.

Keywords: eGovernment, dynamic taxonomy, faceted taxonomy, information overload, decision making

1. Introduction

Information technology is increasingly being used in the work of local and national governments. The work of electronic governments is usually oriented towards providing services to citizen and business. This orientation is particularly noticeable on local and regional levels. Scholl (2005) states that many eGovernment initiatives are subject to an iceberg phenomenon. The top of the iceberg represents the government to citizen and business interaction, which is very visible and evident whereas the governments' internal effectiveness and efficiency is largely disregarded because it is hidden below the surface and therefore, much less visible. It is very important to highlight that in order to further develop eGovernments' interaction with citizen and business, it is necessary to work on internal effectiveness and efficiency. One of the key issues in the internal work of eGovernment is the difficulty of understanding and using the information in the system. This issue is present in almost all organizations that deal with large databases. These databases consist of thousands of information items, and therefore querying and browsing are quite challenging for an average user. Sacco (2000) defines a pattern of access for the user of a complex information base through two phases:

- The locator phase: User attempts to locate the needed information. This phase includes query formulation and the inspection of a result list
- The navigation phase: User uses the set of retrieved items as a starting point for further exploration of relationships between these and other items.

The problem in this process can often be that the user is not certain what he/she is looking for, or what the contents of the database precisely are. In these cases, user often formulates imprecise queries that very frequently result in thousands of items or no items at all (Sacco, 2000). As a result, it becomes very complicated for the employees in eGovernment to understand the information that exists in the system and to understand the relationships between different pieces of information. It would be convenient to organize the information in the system in a hierarchical manner that is quite easy to comprehend.

2. Taxonomy

In a broad sense, classification represents a process of organizing and grouping *entities* into classes by recognizing the characteristics these entities share. Ranganathan (1967) defined the basics of classification, as well as the colon classification. All the entities that need to be classified represent a *universe* of entities. For example, if we want to classify students, we will observe the universe of students. All the entities in the taxonomy have their *attributes*. We can say that two entities are *like* with reference to an attribute, if these entities share the given attribute equally in measure, intensity or extent (e.g. in the universe of students, students have the attribute average grade; hence, two students with same average grade are like with reference to this attribute). The task of simple classification is mapping the universe along one line, according to one attribute. If we consider attributes as dimensions of the universe, by which we can classify the universe, we can say that the universe is multi-dimensional, due to different attributes entities have. Creating a simple taxonomy could be delicate when dealing with real-life information, simply because entities in one universe usually have a large number of different attributes.

2.1 Faceted taxonomy

Faceted taxonomy represents a set of taxonomies each one describing one domain of interest, from a different, preferably orthogonal point of view (Ranganathan, 1965). Faceted taxonomy allows us to classify different items into different taxonomies (e.g. classify students by attribute Average grade, and classify employees by attribute Birth place), as well as to classify one single item into different taxonomies (e.g. classify a specific student by its Average grade and by its Birth place). Hence, in faceted taxonomy it is possible to map a multi-dimensional universe along several lines. To put it simply, in faceted taxonomy it is possible to classify all the entities according to several criteria. A materialized taxonomy represents a faceted taxonomy accompanied by indexes of objects (Tzitzikas & Analyti, 2007). Figure 1 shows a basic materialized faceted taxonomy example that consists of two facets and one object. Facet A is created according to the attribute Location, while facet B is created according to the attribute Activity. We could use this faceted taxonomy, containing these two facets, to classify public services in Serbia, according to two different criteria. Let's say a user wants to find all the faculties in Belgrade. The query is following:

Location.Country.Region.City= "Belgrade" && Activity.ActivityDomain.Service.Institution= "Faculty"

Note that we are using dot notation in the form: facet.group.subgroup. In the Universe U, every facet A, B, C...Z has a finite set of entities, where $A, B, C...Z \subseteq U$. Every facet can be divided into groups (facet A into groups A.1, A.2...A.n, where $A.1, A.2...A.n \subseteq A$, facet B into groups B.1, B.2...B.m, where $B.1, B.2...B.m \subseteq B$). Every group can further be divided into subgroups (group A.1 into subgroups A.1.1, A.1.2...A.1.p, where $A.1.1, A.1.2...A.1.p \subseteq A.1$ etc.).

According to this, the result of the previous query can be represented as:

$X = A.1.2.1 \cap B.1.2.2$

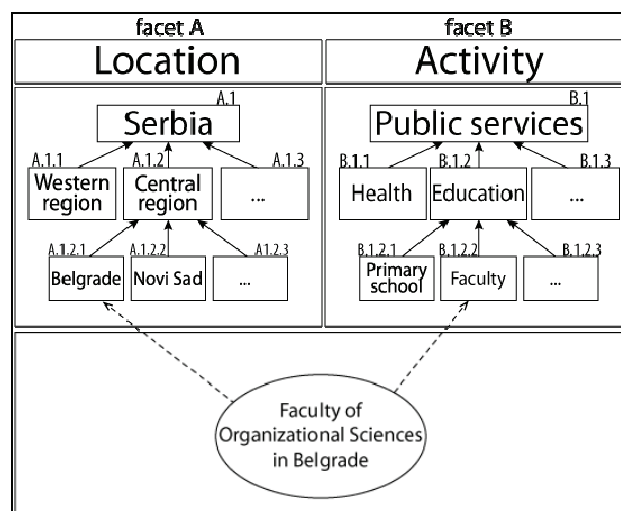


Figure 1: Basic materialized faceted taxonomy example

There are many options for querying and browsing in faceted taxonomy. This process is usually referred to as faceted search. In the beginning, a user is presented with all the entities (focus is on the entire universe) and a representation of the faceted taxonomy. The user performs the *zoom operation* by selecting a concept C in the taxonomy. As a result, the user can see a subset of the universe, i.e. all the entities that match the concept C. The taxonomy representation on the page will be adjusted in order to summarize the new focus. Term *dynamic taxonomy* represents a taxonomy that is able to dynamically adapt to a certain subset of the universe, according to the user's choice (Sacco, 2007). In the alternative scenario, a user performs a classic query (in a search bar) and then receives the results organized in a faceted taxonomy. The user can then perform the zoom operation and narrow the focus.

Ranganathan (1965) developed the colon classification system that was the first classification to apply the principles of faceted taxonomy. According to Ranganathan (1967) there are five fundamental categories: Time, Space, Energy, Matter and Personality. There can be several facets in one category. Besides fundamental categories, every entity belongs to one Basic Facet. Time represents the common meanings of the word time, including seasons and meteorological qualities, such as wet, dry, stormy. Space represents geographical terms, physiographical terms and areas occupied by people (e.g. city). Energy embodies actions of various kinds: conceptual, intellectual, animate etc. Manifestations of the category Matter can be of two kinds: Material and Property. Defining category Personality presents a great difficulty. Besides representing manifestations of personality in wide range of meanings, other manifestations that are easily determined not to be one of the four previously mentioned categories, belong to category Personality. This is the Method of Residues.

2.2 Applications of faceted taxonomy

Although the concept of faceted taxonomy exists for more than four decades, its widespread use on the Internet begun recently. The use of faceted taxonomy in commercial purposes can often be seen on commercial web shops, such as bestbuy.com. This approach became a very popular way of searching and navigating in information collections of web shops, due to its simplicity and user-friendliness. Faceted taxonomy can be applied to various domains, such as e-commerce, multimedia databases and geo-hydrological issues (Sacco, et al., 2011). Faceted taxonomy is also very compatible with other advanced technologies. Vandić, van Dam & Frasincar (2012) present a faceted taxonomy search platform that uses semantic web technology, and is available on-line at <http://www.xploreproducts.com>. When it comes to eGovernment, several models based on faceted taxonomy have been proposed. These models are usually oriented towards eGovernment portals and lead to increased usability and navigability for the users of eGovernment portals. Gupta, et al, (2009) propose CitiScape - an architectural concept based on faceted taxonomy.

3. Information resources model in eGovernment system

In this paper we present a model, based on faceted taxonomy, that can simplify the process of querying and browsing, and thus improve understanding of information and the relationships between different pieces of information. In the case of eGovernment, we consider a universe of information resources in the system, specifically a universe of documents in the system. We can say that this is a growing universe, due to the fact that entities (i.e. documents) will be added to it from time to time. The proposed model for managing information in eGovernment system (specified in Table 1) was created by analyzing all the services provided by eGovernment in Serbia, according to the official information (Republički zavod za informatiku i internet, 2010). The model is, therefore suitable for documents related to services. Introducing new Basic facets can easily broaden this model. All the service related documents should be classified according to their subject and tags. Many classification theories focus on library science where there can be difficulties with determining the subject for some entities. Subjects can be explicit, implicit in the context or hidden within a derived composite term. In eGovernment information resources, this dilemma is reduced to the minimum. Documents in eGovernment are almost always named and tagged according to their purpose and attributes (e.g. "ID card request form"; location: "Belgrade").

The model consists of 9 *level 1 facets* organized in 6 categories. Level 1 facets can be divided into *level 2 facets* and so on. *Final facet* is a facet that contains *labels*. The notation is following: Final facet = {Label1, Label2...}. Labels can contain sub labels. One document can be associated with maximum one label in one final facet, and with maximum n different facets where n is the number of final facets. Figure 2 illustrates previous definitions. In the example, Location is the level 1 facet that is

further divided into level 2 facets. Both of these level 2 facets are final level facet since they contain a hierarchy of labels. A book "Hello world, A novel by Mr. Smith" can be associated with only one label per final facet. From the figure we can see that the book was published in USA, Seattle, while the author's hometown is UK, Brighton.

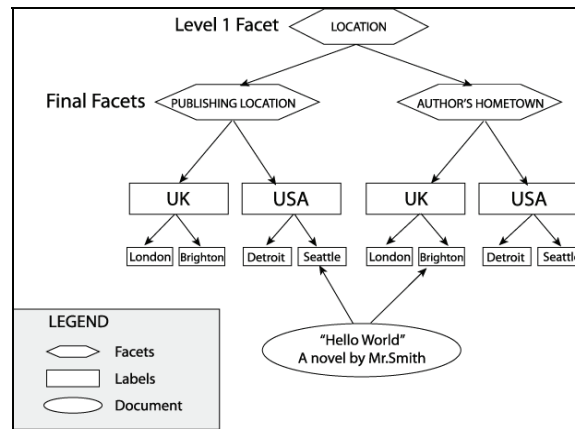


Figure 2: Example illustrating the terms facet, final facet, label

Thorough explanation for the model is following.

- Basic facet
- *By service type:* All services in eGovernment system in Serbia can be divided by the type of service users into two main categories: services to citizens and services to business, hence the Basic facet of the model is By service type that has two labels {Services to citizens, Services to business}.
- Time
- *By document time:* Meaning differs for different document statuses (see below Energy- By status). This facet is of great importance when searching and analyzing the information in the system. Classic classification of Time should be applied (i.e. Years should be divided into Months, Months into Days).
- Space
- *By request location:* Classic classification of Space should be applied (i.e. Regions should be divided into Municipalities, etc.).
- (This category can be expanded with additional facets, such as By user's location or similar)
- Energy
- *By status:* Documents related to services can be either Request for a service, or Confirmation for the service provided (or service declined or operation performed). Document included in the service are Object documents (e.g. A birth certificate requested by the user, that is yet to be handed to the user). This facet should be mandatory.
- *By operation:* Documents can relate to several types of operations. Issuing documents is self-explanatory. Providing information stands for providing simple pieces of information, for which no formal paper is needed (e.g. list of available medications). Scheduling appointments can be described as scheduling appointments with officials, appointments for a certain service or similar. Registering documents refers to registering user's documents (e.g. birth certificate issued by the hospital) or registering user's request (e.g. request for tax relief).
- Matter
- *By immobility:* Housing represents all types of housing facilities, building and construction material, and can further be divided into groups, according to specific needs of the system. Transportation represents all types of transportation and transportation related materials.
- Personality
- *By user group:* User groups facet includes level 2 facets Age groups, Sex groups and Vulnerable groups, but additional level 2 facets based on demographic criteria should be defined.

- *By institution in charge:* This usually refers to an institution that will provide the service itself or will participate in the provision of the service (e.g. National tax service will participate in the service: Income tax registration). This facet contains three level 2 facets.
- *By topic:* All topics can further be specified. Health can be divided in Health insurance, Biomedicine, Medications. Education can be divided into Libraries, High education, Professional development. Employment can be divided into Inspections, Unemployment. Environment can be divided into Ecology, Construction, Architecture. Tax can be divided into groups of existing taxes. Personal documents and Business documents can be divided into groups of explicit document types (e.g. Personal documents: ID Card, Passport, Birth, Marriage and Death certificate, Work permit etc.; Business documents: Company registration, Earnings testimonial, etc.)

Table 1: Faceted taxonomy model for information resources in eGovernment system

Category	Facets (level1)	Facets (level 2)
Basic facet	By service type	Service type = {Services to citizens, Services to business}
Time	By document time	Year
Space	By request location	Region
Category	Facets (level1)	Facets (level 2)
Energy	By status	Status = {Request, Confirmation, Object}
	By operation	Operation = {Issuing documents, Providing information, Scheduling appointments, Registering documents (or requests)}
Matter	By immobility	Housing, Transportation
Personality	By user group	Age group, Sex group, Vulnerable group
	By institution in charge	National level institutions, Regional level institutions, Local institutions
	By topic	Topic = {Health, Education, Employment, Environment, Tax, Human rights, Social welfare, Personal documents, Business documents, Law, Security, Manifestations, Sport}

Figure 3 shows the example of the model with two example documents in the system. In the third column, cells containing labels are filled with light gray color. The example illustrates associations of each document with labels in the facets. Document 'ID Card Request #123' is a document related to Services to citizens. The request was made 1st January 2012 in Belgrade. The status is Request, since this document describes the user's request for a certain service. The operation of this service is Issuing documents, while the topic of the service is Personal documents. The user who made this request belongs to the user age group Senior. This user can further be associated with labels in other final facets (e.g. with a label Male in the final facet Sex group).

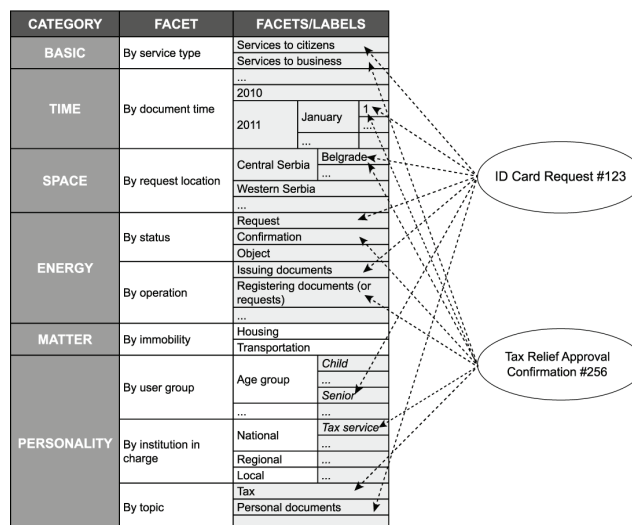


Figure 3: Example of the applied model with two documents in the system

4. Benefits and applications of the model

Pratt, et al., (1999) conducted a study to examine whether faceted browsing was better than clustering and relevancy-ranked results. Study showed that users found more answers with faceted interface, than with other browsing methods. Users' satisfaction with the faceted browsing process was also much higher than with either ranking tool or the cluster tool. Research by Uddin & Janecek (2007) that focused on academic staff and students, also showed that the success in finding relevant results was higher with faceted system than with traditional list system. This research points that most useful features of the faceted systems, in the opinion of the participants, are: possibility to switch from one facet to another, possibility to combine facets, preview the result set and navigate via breadcrumbs.

When faceted taxonomy is applied to the specific domain of eGovernment, several benefits are recognized:

- *Automatic creation of summaries for the documents.* The summary can be created according to document's associations with the taxonomies. In the example in section 3 (shown on Figure 2), summary of the document 'ID Card Request #123' would look like:

Service type - to citizen; Document time - 2011.Jan.10; Request location – Central Serbia.Belgrade; Status – Request; Operation – Issuing documents; User group – Age group.Senior; Topic – Personal documents.

- *Locating documents by an attribute that was not explicitly stated in the document, but its value is uniquely defined by the laws of the taxonomy.* In the example shown on Figure 2, user could search for all documents with request location in Central Serbia, even if region is not explicitly stated in the documents. This possibility is provided by designing the taxonomies.
- *Detailed analysis of the documents by exploring the relationships in the taxonomy.* For example, user could select the label 2011 in the taxonomy, and by performing the zoom operation, see all the documents dating from 2011, as well as the adjusted focus of the original taxonomies. The true benefit of the adjusted focus lies in the fact that the user can see the quantitative aspect of the relationships (e.g. the number of documents related to 'services to citizen' dating from 2011).

Having in mind the specified benefits of the model, we can say that the model allows users (employees in eGovernment) to search information in clear, simple way, as well as to explore relationships between different pieces of information. Specified benefits of the model can be of great importance in the following processes: identifying the need for additional resources, identifying the need for new or improved services, identifying issues in existing services, analyzing set of documents according to a certain attribute (e.g. location), etc.

5. Concluding remarks

The proposed model for managing information resources in system of eGovernment, with the listed benefits, could aid the employees in eGovernment in the processes of searching information, analyzing information and decision making. It would be essential to perform further research in this field, especially when it comes to examining user satisfaction while using the model. It is also advisable to further explore the visualization methods that could accompany the model. Our further research tasks include:

- Analyzing the documents in the system together with a domain expert. This detailed analysis would serve as a foundation for building a detailed model based on the model proposed in the paper;
- Building a pilot model for the information in the system and pilot model usage;
- Evaluating the effectiveness of the pilot model;

References

- Republički zavod za informatiku i internet (2010) *Stanje razvoja eUprave u Republici Srbiji za 2009. Godinu*, Belgrade: Republički zavod za informatiku i internet.
- Uddin, M. N., & Janecek, P. (2007) "The implementation of faceted classification in web site searching and browsing", *Online Information Review*, 31 (2), pp 218-233.
- Vandic, D., van Dam, J.-W., & Frasincar, F. (2012) "Faceted product search powered by the Semantic Web", *Decision Support Systems*, (Article in Press).

- Gupta, V. et al. (2009) "CitiScape Architecture for eGovernment Effectiveness", *Proceedings of the 42nd Hawaii International Conference on System Sciences*, Waikoloa, HI, pp 1-10.
- Pratt, W., Hearst, M. A., & Fagan, L. M. (1999) "A Knowledge-Based Approach to Organizing Retrieved Documents", *Proceedings of the Sixteenth National Conference on Artificial Intelligence*, Orlando: AAAI Pr, pp 80-85.
- Sacco, G. M. (2000) "Dynamic taxonomies: A model for large information bases", *IEEE Transactions on Knowledge and Data Engineering*, 12 (3), pp 468-479.
- Sacco, G. M. (2007) "Research Results in Dynamic Taxonomy and Faceted Search Systems", *Proceedings of the 18th International Conference on Database and Expert Systems Applications*, Los Alamitos: IEEE Computer SOC, pp 201-206.
- Sacco, G. M. et al. (2011) "Dynamic taxonomies applied to a web-based relational database for geo-hydrological risk mitigation", *Computers & Geosciences*, pp 182-187.
- Scholl, H. J. (2005) "Organizational transformation through eGovernment: Myth or reality?", *Proceedings of 4th International Conference on Electronic Government (EGOV 2005)*, Copenhagen: Springer-Verlag Berlin, pp 1-11.
- Ranganathan, S. R. (1967) *Prolegomena to Library Classification* (3 ed.), New York: Asia Publishing House.
- Ranganathan, S. R. (1965) *The Colon Classification*, New Brunswick: Rutgers University Press.
- Tzitzikas, Y., & Analyti, A. (2007) "Faceted taxonomy-based information management", *Proceedings of 18th International Conference on Database and Expert Systems Applications*, Los Alamitos: IEEE Computer SOC, pp. 207-211

Barriers and Facilitators to eGovernment in Spanish Municipalities: A Study Before and After the Recession

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Abstract: eGovernment policies are considered as tools for creating added value to public products and services, thus increasing the administration's efficacy, efficiency, transparency and security. For that reason, it seems crucial to analyse the importance of designing successful eGovernment practices according to the principles of strategic management and organisational change, as do private firms regarding e-business initiatives. Provision of quality services is a feasible goal for public administrations as long as their managers keep in mind that there are a number of barrier and facilitating factors that will influence their performance. In this paper, these barrier and facilitating factors will be described both theoretically and empirically, by means of a factor analysis over the responses of a nation-wide survey to Chief Information Officers (CIOs) in local administrations, in an attempt to determine which factors have more influence on the final quality of the public services provided by Spanish local administrations. Furthermore, given the dramatic changes in the economic, legal and political environments, it is interesting to find out whether the perceived consideration of these factors has also changed between current times and six years ago, when most local Governments in Spain were taking their first steps towards eGovernment. This way, this paper will reflect the effects of formulating an eGovernment strategy in times of growth, but implementing it in times of recession. Therefore, the goal of this paper is twofold: on the one hand, it provides an empirically-based classification of barrier and facilitating factors on the basis of two surveys carried out in 2005 and 2011; and, on the other hand, a comparison will be made of the global perceived effect that these factors may have on the municipalities' strategy.

Keywords: critical success factors, quality public services, Spain, municipalities, eGovernment strategy

1. Introduction

Public institutions facilitate and shape the development of infrastructure and services and are experimenting with new ways to deliver information and services via electronic channels. The importance of municipal governments having the capability to do more with less has made the Internet an attractive service delivery alternative (D'Agostino et al, 2011). In addition, the majority of eGovernment studies have focused on central Government strategies (Wauters, 2006), even though the local level is often the main point of contact for the delivery of public policy. In fact, local Governments have a tendency to be early technology adopters, because they are closer to the communities they serve (Neff, 2007).

All in all, it seems crucial to analyse the importance of designing successful eGovernment practices according to the principles of strategic management and organisational change. According to the existing literature, there are many factors that affect the success of eGovernment. These are known as eGovernment facilitators and barriers, for they might help to achieve success in the design and implementation of a council's eGovernment strategy, but they can also create difficulties. Local councils face the challenge of learning to recognize such factors and implementing whatever measures are needed to overcome or deploy them, depending on their influence.

This paper explores the facilitating and barrier factors that may shape the formulation and implementation processes of strategic eGovernment in Spanish municipalities with a longitudinal perspective: years 2005 and 2011, this is, before and after the advent of the economic crisis, also considering a number of changes that have taken place in Spain during this period.

Spain ranks 9th in the world eGovernment development index by country (UN, 2010), just behind Australia and above France, and 3rd in the e-participation index. Therefore, it is a quite well-developed country in terms of eGovernment, and its practitioners have a certain degree of knowledge of the topic. This ensures that the findings of the research are good enough for establishing conclusions from which many other countries may benefit. Particularly, Spain is, generally speaking, a fairly advanced country in the information society, notably in the area of eGovernment services and availability of broadband networks. Sophistication of online services is also above the European Union average, although there is an uneven development and quality as well a lack of integration

among services offered by different administrations and departments. The national ICT strategic plan, implemented in 2007, comprises a series of specific programmes focused on citizens, companies, the digital context, digital public services and local e-administration (EU, 2010) to overcome this dislocation. A direct consequence of this plan is the Act for Citizens' Electronic Access to Public Services, also known as "Act 11/2007". Its purpose was to force Spain's local administrations to provide electronic access to their most important services by 2010. Therefore, the existing legal framework has forced a number of changes in the local administration arena.

Quantitative data were obtained from the experience of eGovernment practitioners. First, in 2005, a quantitative survey was sent to every municipality in Spain over 5000 inhabitants with an official web site, as this is the minimum requirement in Layne and Lee's eGovernment maturity stage model (Layne and Lee, 2001). Second, the same survey was sent again in 2011 to those municipalities that had participated in the first stage. These quantitative findings express the respondents' impressions on the presence of the facilitating and barrier factors and the initiatives that are enforced to deal with them with regards to their particular municipalities. The findings established a standing emphasis on political issues as triggers of local eGovernment success.

The structure of the paper is as follows. The next section addresses the academic arguments, whereas the third one presents the methodology employed. The following section presents the discussion of these findings. The paper concludes with some suggestions aiming at a better comprehension of the local eGovernment phenomenon, as well as the future research lines that may stem from this project.

2. Literature review

The last years have seen eGovernment implementation efforts move from cataloguing basic Government information to providing interactive electronic services to citizens. EGovernment refers to the provision of internal administration services to its external environment, which is related directly with the need for internal transparency of the public organisation. Given that the public sector is often described as bureaucratic, inefficient and less-technology savvy (Kamal and Alsudairi, 2009), eGovernment may evolve as a necessary revolution, since it has the potential to change public sector agencies and to offer many benefits that were not previously envisaged (Irani et al, 2008).

Most current research on eGovernment, particularly regarding local Government, consists in the description of individual, limited initiatives, avoiding theoretical frameworks that may provide them with a solid foundation (Becker et al., 2003). It is essential thus to compare what academics and practitioners have to say in the matter of local eGovernment, in order to bridge the gap between what has been written and what is done. Carrizales et al. (2006) and Heeks and Bailur (2007) have highlighted the need for longitudinal studies in the eGovernment field, in order to better understand the impact of the Internet on public entities.

On the constructive side, Criado and Ramilo (2003) disclose the following factors that may lead eGovernment strategies towards success. First, a certain level of interest and commitment on the part of politicians regarding the project may provide the opportunity to rethink how government services are offered, enhancing transparency, openness, accountability, participation, and other benefits (Torres et al, 2005). In addition, adequate legal support may help governments to obtain funding, and even force them to deploy an eGovernment strategy, thus provoking major changes in policies and legislation, as well as institutional infrastructures (Yoon and Chae, 2009). Finally, a good strategic planning takes into account the actual needs of the municipality. Since citizens expect better Government services, this would a way to press for the adoption of more efficient public services (Tan et al, 2005; Torres et al, 2005).

There are some authors who support the introduction of private sector practices. This philosophy is known as New Public Management (NPM) (Hood, 1995; Pollitt, 2000). Two NPM elements relate directly to the success of eGovernment: human resource management policies and quality management programmes. Regarding human resource management policies, public sector workers may respond positively to an initiative they perceive as contributing to the organization's mission. Human resource managers may thus encourage the deployment of a wide knowledge management programme associated with the organizational goals and missions of the eGovernment strategy (Yao et al., 2007).

Following the NPM postulates, the purpose of public quality management programmes is to achieve excellence in the provision of e-services (Dewhurst et al., 1999; Teicher et al., 2002). These quality management programmes are usually based on the ISO 9000 standard, or on quality models such as the EFQM model, and may take the shape of public service charters or excellence awards. These programmes have a greater effect when impelled from the inside of the public organisation, since they act as a self-motivating force.

Finally, for Janssen et al. (2006), one of the most relevant facilitators is the design of a customer-oriented website, which will provide a number of organisational, strategic and operational benefits. This includes a usable interface design, self-explanatory and friendly, so that users maximize their efficiency in terms of time and money (Pieterse et al., 2005). Furthermore, the provision of an appropriate technical infrastructure and the redesign of local and interagency processes are other critical elements that will determine future success (Ebrahim and Irani, 2005).

Table 1 shows a summary of all the facilitating factors discussed up to this point.

Table 1: Facilitating factors

Facilitator	Literature
A capable formal project manager in the council	Criado and Ramilo (2003)
A joint rationalisation process of internal workflows	Criado and Ramilo (2003) Ebrahim and Irani (2005) Torres et al (2005)
A well-designed information system	Ebrahim and Irani (2005)
Acknowledgment of need for support from higher institutions	Criado and Ramilo (2003) Torres et al (2005)
Customer-oriented portal	Pieterse et al. (2005)
Legal support	Criado and Ramilo (2003) Yoon and Chae (2009)
Financial resources	Criado and Ramilo (2003)
Political awareness of the importance of IT projects	Criado and Ramilo (2003) Tan et al. (2005) Torres et al (2005)
Political commitment and leadership	Criado and Ramilo (2003) Torres et al (2005)
Qualified human resources	Scott et al. (2004) Yao et al. (2007)
Quality management programmes	Dewhurst et al. (1999) Teicher et al. (2002)
Strategic consideration of eGovernment policies	Criado and Ramilo (2003) Ebrahim and Irani (2005)
Usability of council's website	Pieterse et al. (2005) Janssen et al. (2006)

Similarly, there are several hindering factors that have been analysed by many researchers. According to Eyob (2004), the main barriers for the development of a successful eGovernment strategy are the scarcity of technological, financial and human resources (the latter in terms of qualifications). Nevertheless, the actual endowment of resources within local Governments will largely depend on their bestowed political value, so that their importance as barriers is associated to political leadership, or lack thereof. A good example of these political barriers would be the Spanish Administrative Procedure and Legal System Act, passed in 1958 and still in force. Indeed, some political leaders may be afraid of the changes that eGovernment entails, even of losing power, thus becoming a real threat for its success (Ebrahim and Irani, 2005). However, this fear can be overcome by making politicians aware of the benefits that eGovernment may provide.

Other authors have found, as a barrier to eGovernment, the need for a cultural change towards the values and principles of the information society rather than keeping to the traditional bureaucratic model (Riege and Lindsay, 2006). Sundberg and Sandberg (2006) propose that the process of change in the eGovernment domain should be continuous and strategic rather than embark on huge radical projects. They observed that the basic problem in Government implementation arises with the traditional command and control of bureaucratic structures. Besides, changes in the internal workflow may be necessary to make the local council's administration run smoothly (Waisanen, 2002). Ebrahim and Irani (2005) have considered that the most important barriers are rooted in the implementation of an adequate IT infrastructure for a user's experience of easy and reliable electronic access to

Government. On the whole, they agree with Bonham et al. (2001) on the fact that Governments consider a lack of technical infrastructure as a significant barrier to the development of public sector organisations' capabilities to provide online services and transactions. Amongst them, the most remarkable are the high cost of IT professionals and consultancies, the cost of installation, operation and maintenance of eGovernment systems, and the cost of training and system development.

Amongst other barriers that relate to IT, one of the most frequently cited is the security and privacy of the transactions. Indeed, an eGovernment strategy might be considered successful only when all the stakeholders are comfortable using the applications and means to carry out electronic transactions with the councils. Therefore, investing in security matters is a necessary but not sufficient condition for the success of the eGovernment strategy and the confidentiality of personal data and other sensitive information (Bonham et al, 2001; Ebrahim and Irani, 2005).

Li (2003) and Norris et al. (2001) concur in identifying the human factor barriers as the greatest, since those related to technology can be easily overcome with money. The shortage of IT skills affects both the provision and the implementation of eGovernment services, from the supply and demand sides respectively and therefore should be tackled from both points of view. This barrier increases its effect with the degree of development of the eGovernment portal, which is necessary to enhance the effectiveness of eGovernment strategies. This has led many public sector organisations to offer IT training courses for citizens and public workers, and to recruit previously qualified personnel from the private sector.

Finally, the European Union has also addressed this issue (European Union, 2007), by creating a project which seven key categories of barriers that may block or restrain progress on eGovernment, derived from literature reviews and the analysis of the experience and knowledge of the project's partners and several experts and stakeholders. These categories are the following: leadership failures (lack of political will, poor strategic vision and planning, poor understanding of eGovernment by senior management); financial inhibitors; digital divides and skill gaps; poor coordination between local and regional governments; workplace and organisational inflexibility (departmental "turf wars", failure to learn from good practice); lack of trust and poor technical design.

A summary of the barrier factors addressed in this section is shown in Table 2.

Table 2: Barriers

Barrier	Literature
Citizens do not demand e-services	European Union (2007)
Complexity of public work processes and bureaucracy	Waisanen (2002) Riege and Lindsay (2006) Sundberg and Sandberg (2006) European Union (2007)
Cost of IT infrastructure	Bonham <i>et al</i> (2001) Ebrahim and Irani (2005)
Digital illiteracy	European Union (2007)
Disregard for eGovernment advantages	Ebrahim and Irani (2005)
Employees' resistance to change	Norris <i>et al</i> (2001) Li (2003)
Lack of political will	Criado and Ramilo (2003) European Union (2007)
Politicians' lack of knowledge about eGovernment's benefits	Ebrahim and Irani (2005)
Scarcity of financial resources	ICMA (2002) Eyob (2004) European Union (2007)
Scarcity and unsuitability of IT	Eyob (2004) European Union (2007)
Scarcity of qualified personnel	Norris <i>et al</i> (2001) Li (2003) Eyob (2004)
Security and trust issues	Ebrahim and Irani (2005) European Union (2007)
Unsuitable legislation	Criado and Ramilo (2003)

If we compare Tables 1 and 2, it can be seen that both lists display almost the same factors, only mirrored from a positive or negative perspective depending on whether they are enablers or barriers. Therefore, they can be regarded as Critical Success Factors (CSFs), which are defined by Boynton and Zmud (1984) as “those few things that must go well to ensure success”. The role that each factor plays in eGovernment performance will depend on how public governments approach them (Joia, 2004). Thus, we feel it necessary to address the barriers and factors separately since the effect from to gain access to something one lacks may be much more negative than to have it available but not using it.

3. Research methodology

This paper is based on a longitudinal quantitative survey carried out in two different years, 2005 and 2011. This time gap was chosen for three reasons. First, legislation has evolved greatly on this topic, In order to stimulate local eGovernment initiatives, the “Act 11/2007”, was passed. As was previously mentioned, its purpose is to force every local administration in Spain to provide electronic access to their most important services by 2010. Secondly, both general and local elections have been held during these six years, resulting in a political change at both levels; and last but not least, the general environment has changed notably from an expansion situation in 2005 to that of the current economic, social and political crisis.

In 2005, an electronic questionnaire was sent to the Spanish municipalities that both had an official website and a population over 5000 inhabitants. As was posited, Layne and Lee (2001) establish that the less developed stage of eGovernment is that of web presence; therefore, our first selection criterion is simply having a website. If there was a former site, now extinct, or if the council had published its website after the survey had been launched in 2005, these municipalities were not considered suitable for our purposes. Even though this is not a instrument required for eGovernment policies, it is believed that it is a must because, although almost every city council has an e-mail address, not all of them had a website, so that only a certain percentage have consciously taken a step forward towards their integration into the new economy. As for second criterion, municipalities with population under 5000 usually depend on supramunicipal institutions (“Diputaciones”) for their IT management, thus lacking autonomy in the adoption of new management practices in order to better satisfy citizens’ needs (Hood, 1995; Pollitt, 2000).

The questionnaire was addressed to the Chief Information Officer (CIO) of the local council or, should this position not exist, to the person in charge of IT issues (Claver et al, 2009). Other researchers have also relied on the practical knowledge that CIOs possess regarding the implementation of eGovernment strategies, like Ward (2006), and their role as key players in transformation of public services has been highlighted by the SOCITM (UK Society of Information Technology Management) (SOCITM, 2006).

The same questionnaire was re-sent in the last semester of 2011 to the 165 councils that participated in the 2005 stage (see table 3). The reason for aiming to the participant councils is to avoid one of the main limitations of longitudinal studies, since it is impossible otherwise to know for sure if the firms answering the present and past questionnaires are the same. Previous longitudinal studies like that by Casadesus and Karapetrovic (2005) were equally addressed to the same population, though this does not necessarily mean that the samples coincide.

CIOs were presented with the two lists of factors shown in tables 1 and 2, on a Likert scale, and they were asked to value their impact on eGovernment success from 1 (none) to 5 (very strong), with regard to their particular municipalities. For the following steps, only those items which were valued over 3 in the pre-test were taken into account. The final lists of items were validated in 2005 by Cronbach’s alpha test for internal consistency (Claver et al., 2009), and again in 2011.

Table 3: Details of the 2005 and 2011 surveys

	Municipalities	Responses	α test facilitators	α test barriers
2005	960	165 (17%)	0.84	0.8
2011	165	59 (36%)	0.78	0.6

4. Results and discussion

First, the facilitating factors are ranked, and the most remarkable positions are discussed.

4.1 Facilitators

Table 4 shows a summary of the final items deemed as positive influences for local eGovernment strategies, their value (mean) and their ranking in 2011. The parameter “Item value” refers to the degree of effect that such a factor has on eGovernment success, according to the perceptions of the municipal CTOs (1: none at all; 5: very strong).

Table 4: Ranking of the most relevant facilitating factors

Facilitators (as per 2005 ranking)	Item value 2005	Item value 2011	Ranking 2011	Change
1-Political leadership and commitment	4.36	4.59	1	+5.3%
2-Qualified human resources	4.15	4.47	2	+7.7%
3-Usability of website	4.08	4.02	8 (↓)	-1.5%
4-Availability of financial resources (from external programmes)	4.07	4.32	3 (↑)	+6.1%
5-Acknowledgment of eGovernment benefits by political statements	4.03	4.08	6 (↓)	+1.2%
6- EGovernment explicit strategic planning	3.99	4.15	5 (↑)	+4%
7- IT infrastructure availability	3.99	4.25	4 (↑)	+6.5%
8-Designation of a formal project manager	3.94	4.03	7 (↑)	+2.3%
9-Quality management models application	3.61	3.61	9	0.0%
10-Changes in decision making processes towards less bureaucracy	3.43	3.47	10	+1.2%

On the whole, it is shown that the item values are higher in 2011 than in 2005. Consequently, CIOs are more conscious of the effects that these factors may have on their eGovernment strategies, especially of the role played by politicians and human resources, and have recognized the role of IT in their success.

Actually, these results show that the order of importance is almost the same in both surveys: the most relevant factor is still the political commitment to eGovernment strategies, followed by having qualified human resources who are IT-savvy and able to provide e-public services. The role of politicians is definitely the most important, because it is their tacit (e.g. endowment of resources) and explicit (e.g. signs of support and public services supply) behaviour that enhances eGovernment at local levels. The competences and commitment of public workers are likewise significant in the correct development of eGovernment strategies, especially if the required technical competences are found within the organisation.

Still, in 2005 the third position goes to a usable and friendly website, but this item has dropped considerably in the scale in 2011, presumably because it has become a somewhat cheap and known commodity. However, IT infrastructures have been pushed up three places, meaning that CIOs are aware of the boost that an intelligent expenditure in IT may bring to their councils.

The lower positions are consistently held by management-related elements: quality management programmes and changes in workflow and decision-making processes. The former may owe its place to the scarcity of these programmes among local councils, even 6 years after the first wave of the study; therefore, those CIOs that have not implemented any of these practices still do not have a full understanding of the effect of quality management strategies. The latter may respond to the pervasive red tape in Spanish public organisations, strictly ruled by administrative laws that clash more often than not with leaner workflows. This has hardly changed even with the political changes and the economic situation, although it might have to vary if Spain aims for a more efficient public sector.

In sum, those public organisations that wish to build competitive advantages for eGovernment, must still exploit strengths based on political commitment, adequate infrastructures and a set of organisational behaviours consistent with the current legislative and economic situation. Political changes and a worsened environment have only reinforced the effects that these factors have on local eGovernment success.

4.2 Barriers

As for the barriers, Table 5 follows the same layout as Table 4.

Table 5: Ranking of the most relevant barriers

Barriers (as per 2005 ranking)	Item value 2005	Item value 2011	Ranking 2011	Change
1- Lack of political will	4.12	4.44	1	+7.8%
2- Politicians' lack of knowledge on eGovernment's benefits	3.93	4.02	5 (↓)	+2.3%
3- Scarcity of financial resources	3.93	4.25	2 (↑)	+8.1%
4- Scarcity of qualified human resources	3.90	4.02	5 (↓)	+3.1%
5- Cost of IT infrastructure availability	3.62	3.88	7 (↓)	+7.2%
6- Complexity of public work processes and bureaucracy	3.43	4.12	3 (↑)	+20.1%
7- Decisions are made by politicians instead of IT professionals	3.42	3.8	8 (↓)	+11.1%
8- Employees' resistance to change due to lack of knowledge	3.36	4.07	4 (↑)	+21.1%
9- Citizens do not demand e-services	3.33	3.47	9	+4.2%
10- Unsuitable legislation	3.09	3.14	10	+1.6%

As before, the values of all items are considerably higher in 2011 as in 2005. Even more, six years ago these items presented quite low values when compared to those of the facilitators, but today they are quite similar; pessimism is the norm now in Spanish municipalities. Therefore, CIOs are more wary of the negative effects of these barriers, particularly the scarcity of financial resources and the resistance of employees to change, which is not surprising considering the current economic and social circumstances of the Spanish public sector.

Once again, the most important barrier is the same in the two surveys: the political will, or lack thereof in this case, which confirms the importance of politicians in the final performance of eGovernment. Such hierarchical structures need the approval of top management for every stage in the work process, which may lead to service inefficiencies and, more importantly, denial of funds. The allocation of resources within local institutions belongs mostly with the political levels, although they are not the ones to put these modernisation strategies into practice, which leads to many negative implications for the expected performance.

As for the rest of barriers there is a number of significant changes in the ranking of their perceived importance. Information on e-Government is commonplace in Spanish councils today, so politicians are now eGovernment savvy; and public employees have the necessary skills, even if they are more resistant to change because of the uncertainty and mistrust that transpires all over their organizations. The cost of IT infrastructures holds a 7th position, instead of a 5th, because IT is cheaper today, the difficulty residing in the allocation of the necessary budget for it.

Taking a look at the least important barrier, Spain's unsuitable legislation on eGovernment remains in the last position because of the rapid advances that Spain has been making in this area since 2001, reinforced in 2007 and 2009 with the legal changes introduced.

In brief, the weaknesses of the municipalities' eGovernment strategies come essentially from political and bureaucratic aspects and the availability of monetary resources, instead of human resources as in 2005. In this case, the political and situational changes are perceived to affect the municipalities'

strategies, making them less attuned towards the achievement of a successful eGovernment performance.

To sum up, the results show that the most relevant critical success factors, both positively and negatively, are those related to political leadership and commitment, which have increased their perceived effect over the considered time gap. Within the public sector, management commitment is therefore critical. However, financial issues, IT and human resources are viewed differently as a facilitating factor (increasing their relative importance) than as barriers: they are still important, but bureaucracy has climbed a few positions once the difficulties of implementing an eGovernment strategy have arisen.

5. Conclusions

This research contributes insights to the literature by empirically investigating factors affecting eGovernment success at municipal levels. Also, this paper attempts to bridge the gap between theory and practise of eGovernment at a local level, by studying the comprehensive literature about barriers and facilitators for eGovernment.

Both the literature review and the perceptions of the CIOs demonstrate that the facilitating and barrier factors are very similar, while the differences lie on the perceived specific influence of each factor. Indeed, the empirical analysis has found that Spanish local councils regard a number of requirements for a satisfactory implementation of eGovernment strategies, which are consistent through time in nature but not so much in perceived effect. The most relevant critical success factors, both positively and negatively, are those issues related to political leadership and commitment, which have increased their perceived effect over the considered time gap. The public sector is prone to re-organizations as politicians and governments change, which frequently results in changing management structures, responsibilities and roles. As a collateral effect, this has altered the CIOs' perceptions regarding the role that the availability of resources plays in the success of local eGovernment, and portrays human resources as the most valuable asset and monetary resources as the most constricting, whereas technical issues, once very important in the minds of the CIOs, have been relegated in importance, alongside with legal support. The most outstanding change has been that of the perception of bureaucratic barriers, which were not so obvious at the formulation stage as six years later. This is particularly true in the case of public sector organisations, where hierarchy rules over need in many cases.

Several limitations should be noted. First, there is the potential sampling bias due to the fact that the study was not based on a truly random sampling, but a sample number of pre-selected subjects. Second, the measures used here were perceptual rather than objective. An opportunity for researchers would be to revise this classification employing other taxonomies or statistical methodologies. Nevertheless, the priorities shown in this paper are sensible as they come from the perspective of the practitioners themselves. Moreover, since this study relied primarily on local government CIOs' opinions, who represent only one group of stakeholders, future researchers might consider whether citizens are of the same opinion, as well as other council staff. Finally, the interpretation of these results might benefit greatly from a deeper quantitative analysis that could show the relationship between these factors and the descriptive characteristics of the local councils, such as size, budget, or political party in charge.

References

- Becker, J.; Algermissen, L. and Niehaves, B. (2003) "*Implementing eGovernment Strategies. A procedural model for process oriented eGovernment projects*", Proceedings of the 2003 International Business Information Management Conference (IBIMA): "E-Business and organisations in the 21st Century", December 16-18, El Cairo, Egypt.
- Bonham, G., Seifert, J. and Thorson, S. (2001) "*The transformational potential of eGovernment: the role of political leadership*", Proceedings of the 4th Pan European International Relations Conference, Kent, UK.
- Carrizales, T., Holzer, M., Kim, S. T. And Kim, C. G. (2006) "*Digital governance worldwide: A longitudinal assessment of municipal web sites*", International Journal of Electronic Government Research, Vol. 2, No. 4, pp 1-23.
- Casadesus, M. and Karapetrovic, S. (2005) "*Has ISO 9000 lost some of its lustre? A longitudinal impact study*", International Journal of Operations and Production Management, Vol. 25, No. 6, pp 580-5.
- Claver-Cortés, E., de Juana-Espinosa, S. and Tarí, J.J. (2009) "*EGovernment challenges: Barriers and facilitators in Spanish city councils*". In Camison et al. (Ed), *Connectivity and Knowledge Management in Virtual Organisations*, pp 211-228. Hershey (PA): Ed. Idea Group Publishing

- Criado Grande, J.I. and Ramilo Araujo, M.C. (2003) "EGovernment in practice. An analysis of web site orientation to the citizens in Spanish municipalities", *The International Journal of Public Sector Management*, Vol. 126, No. 3, pp 191-218.
- D'Agostino, M.J.; Schwester, R.; Carrizales, T.; Melitski, J. (2011) "A study of eGovernment and e-governance: an empirical examination of municipal websites", *Public Administration Quarterly*, Vol. 35, No. 1 (Spring 2011), pp 3-25.
- Dewhurst, F., Martínez Lorente, A.R., and Dale, B.G. (1999) "TQM in public organisations: an examination of the issues", *Managing Service Quality*, Vol. 9, No. 4, pp 265-273.
- Ebrahim, Z. and Irani, Z. (2005) "EGovernment adoption: architecture and barriers", *Business Process Management Journal*, Vol. 11, No. 5, pp 589-611.
- European Union (2007) [online]
http://www.egovbarriers.org/downloads/deliverables/solutions_report/Solutions_for_eGovernment.pdf
 (accessed on 17/10/210)
- Eyob, E. (2004) "EGovernment: breaking the frontiers of inefficiencies in the public sector", *Electronic Government*, Vol. 1, No. 1, pp 107-114
- Heeks, R. and Bailur, S. (2007) "Analyzing eGovernment research: Perspectives, philosophies, theories, methods, and practice", *Government Information Quarterly*, Vol. 24, No. 2, pp 243-265.
- Hood, C. (1995) "The New Public Management in the 1980s: variations on a theme", *Accounting Organisations and Society*, Vol. 20, No. 2/3, pp 93-109.
- Hughes, M.; Scott, M. and Golden, W. (2006) "The role of business process redesign in creating eGovernment in Ireland", *Business Process Management Journal*, Vol. 12, No. 1, pp 76-87.
- Irani, Z.; Love, P.E.D. and Jones, S. (2008) "Learning lessons from evaluating eGovernment: reflective case experiences that support transformational government", *The Journal of Strategic Information Systems*, Vol. 17, No. 2, pp 155-164.
- Janssen, M., Gortmaker, J. and Wagenaar, R.W. (2006) "Web service orchestration in public administration: challenges, roles and growth stages", *Information Systems Management*, Vol. 23, No. 2, pp 44-55.
- Joia, L.A. (2004) "Developing Government-to-Government enterprises in Brazil: a heuristic model drawn from multiple case studies", *International Journal of Information Management*, Vol. 24, No. 2, pp 147-166.
- Kamal, M.M. and Alsudairi, M. (2009) "Investigating the importance of factors influencing integration technologies adoption in local government authorities", *Transforming Government: People, Process and Policy*, Vol. 3, No. 3, pp 302-331.
- Layne, K. and Lee, J. (2001) "Developing fully functional EGovernment: A four stage model.", *Government Information Quarterly*, Vol. 18, No. 2, pp 122-136.
- Li, F. (2003) "Implementing EGovernment strategy in Scotland: current situation and emerging issues", *Journal of Electronic Commerce in Organizations*, Vol. 1, No. 2, pp 44-65.
- Neff, D. (2007) "Local wireless networks- a prerequisite for the future", *Public Management*, Vol. 89 No. 2, pp 10-14.
- Norris, D.F.; Fletcher, P.D. and Holden, S.H. (2001) Is your local government plugged in? Highlights of the 2000 electronic government survey, International City/County Management Association (ICMA) and Public Technology, Inc. (PTI), Maryland.
- Pieterse, W., Ebbens, W., and Van Dijk, J. (2005) "The opportunities and barriers of user profiling in the public sector", *Proceedings of the 2005 EGOV*, Copenhagen, Denmark.
- Pollitt, C. (2000) "Is the emperor in his underwear? An analysis of the impacts of public management reform", *Public Management*, Vol. 2, No. 2, pp 181-99.
- Riege, A. and Lindsay, N. (2006) "Knowledge management in the public sector: stakeholder partnerships in the public policy development", *Journal of Knowledge Management*, Vol. 10, No. 3, pp 24-39.
- Scott, M.; Golden, W. and Hughes, M. (2004) "Implementation strategies for eGovernment: a stakeholder analysis approach", In *Proceedings of ECIS: The European Information Systems Profession in the Global Networking Environment*, Turku, Finland.
- SOCITM (2006) "Modern public services: a role for change. The CIO as agent of transformation", [online],
<http://www.socitm.gov.uk/socitm/Services/Socitm+Insight/News/Role+of+CIO.htm> (accessed on 10/10/06, updated on 19/01/10)
- Sundberg, H.K. and Sandberg, K.W. (2006) "Towards eGovernment: a survey of problems in organizational processes", *Business Process Management Journal*, Vol. 21, No. 2, pp 146-161.
- Tan, C.; Pan, S. and Lim, E. (2005) "Managing Stakeholder Interests in eGovernment Implementation: lessons learned from a Singapore eGovernment Project", *Journal of Global Information Management*, Vol. 13, No. 1, pp 31-53.
- Teicher, J.; Hughes, O. and Dow, N. (2002) "EGovernment: a new route to public sector quality", *Managing Service Quality*, Vol. 12, No. 6, pp 384-393.
- Torres, L.; Pina, V. and Royo, S. (2005) "EGovernment and the transformation of public administrations in EU countries – beyond NPM or just a second wave of reforms?", *Online Information Review*, Vol. 29, No. 5, pp 531-553.
- Waisanen, B. (2002) "The future of EGovernment: Technology fuelled management toll", *Public Management*, Vol. 84, No. 5, pp 6-9.
- Ward, M. (2006) "Information Systems Technologies: a public-private sector comparison", *The Journal of Computer Information System*, Vol. 46, No. 3, pp 50-56.

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- Wauters, P. (2006) "*Benchmarking eGovernment policy within the e-Europe programme*", Aslib Proceedings, Vol. 58, No. 5, pp 389-403.
- Yao, L.J., Kam, T.H.Y and Chan, S.H. (2007) "*Knowledge sharing in Asian public administration sector: the case of Hong Kong*", Journal of Enterprise Information Management, Vol. 20, No. 1, pp 51-69.
- Yoon, J. and Chae, M. (2009) "*Varying criticality of key critical success factors national e-strategy along the status of economic development of nations*", Government Information Quarterly, No. 26, pp 25-34
- United Nations (2010) "United Nations EGovernment Survey 2010" [online], http://www2.unpan.org/egovkb/documents/2010/E_Gov_2010_Complete.pdf (accessed on 25/11/11).

Experiences From the Development of the Greek School Profiling System

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Abstract: The Greek educational system lends itself to advanced IT handling, mainly due to its highly centralized regulatory structure and operation. The administrative structure follows a 4-tier hierarchy (school, prefectural, regional and ministry-national level), where administrative entities operate under a strict jurisdictional status. Strategic educational planning takes place at the higher level, whereas the prefectural and regional levels are responsible for the monitoring and daily support of school operation and administrative workflows. Obviously, decision making within such a multilevel structure raises the need for an advanced school profiling system in order to effectively collect, project and analyse the large volume of daily produced data. Aiming at the a) rationalisation of decision making, b) quantification and improvement of public services and structure response, c) simplification of process flows, and d) enhanced provision for future needs and trends, a central data warehouse has been developed, enriched with state-of-the-art business intelligence features, based on data automatically provided and processed by information systems at the local (school) level. On-line analytical processing (OLAP) lies at the heart of the business intelligence engine, permeated by data transformations called dimensions, usually hierarchical, as dictated by the inherent operational structure of the educational system itself. Typical such dimensions include the spatial -ranging from a school unit, through the supervising prefectural and regional entities and up to the central administrative level- and temporal ones, school types, teacher employment status, teacher specialisation, teaching and other administrative assignments and roles. All data are logically linked under this concept, so “drilling through” to several dimensions and decomposing information accordingly is significantly facilitated and provided to all users in multiple dynamic representations, such as hierarchical graphs, tables, decomposition trees, etc. The benefits of this www-enhanced profiling suite include the following: key information regarding the structure and operation of the educational system at any level is effectively provided to the non-IT expert in friendly graphical forms, abstracting away the particular data sources or the technicalities and interfaces of the various underlying information systems, advanced algorithmic engines can detect and visually present anomalies and/or peculiarities in the structure and operation of the educational system so that central administration can effectively make informed decisions, teacher handling/allocation and other critical administrative tasks can be algorithmically supported and effectively monitored. In the rest of this paper, we a) briefly explain our rationale, methodology, technical aspects and current progress of our work, and b) summarize future continuation under the eGov reform vision recently adopted by the Greek educational community.

Keywords: eGov, education, decision making, OLAP, decision support tool

1. Introduction - rationale

The Greek public primary and secondary educational system is characterized by a centralized and hierarchical structure, reflected both in its administration and daily operation. Teacher allocation, class organisation and school curricula are all handled centrally. The Ministry of Education is responsible for producing a strategic plan and a regulatory framework which school and teacher administration at all levels should adhere to. Operational flow of administrative procedures reaches down to the school level through two intermediate administrative entities, at the regional and prefectural levels, respectively.

Every year, through the afore-mentioned 4-layer hierarchy, schools assess their needs (in terms of teacher vacancies, growth of student population, curriculum changes, etc) and apply for the appointment of suitable educational personnel, among other resources. Teacher allocation takes place under various administrative procedures throughout the academic year, such as hiring of permanent personnel, transfers of permanent personnel, yearly appointment of temporary teachers, etc. Teacher allocation and handling is an indicative example of a task that lies in the heart of the educational administration and raises the need for decision support through the use of ICT. The Greek educational community has a manageable size (~15.000 primary and secondary schools,

~170.000 permanent teachers, ~1.500.000 students), which along with its uniform hierarchical structure favors the use of advanced ICT to facilitate decision making.

Experience indicates that such quantitative computer-aided analysis is often hindered, as the environment in which decisions are made is composed of complex political, socio-economic and other factors (Fisher et al. 1990; Nutt 2006). However, during the last few years the Ministry of Education has embarked on a global eGov strategy, under the term “The Digital School”, employing the use of ICT in all aspects of educational practice, such as infrastructures, teaching, digital content and educational administration. The envisioned open, flexible and collaborative environment is expected to empower the educational community through the efficient use of public resources and the provision of added-value services:

- tools to implement educational policy and monitor its application, through informed decision making
- simplification of administrative tasks
- transparency in transactions
- reinforcement of the interrelationships among the different administrative levels

The purpose of this paper is to a) briefly outline the operational vision that permeates current initiatives to introduce ICT support for educational administration in Greece, and b) to present the main conceptual and technical characteristics of a *Digital School Profiling System*, which is a www-enabled tool that employs advanced data warehousing and analysis techniques in order to serve as a high level, common interface for the presentation and monitoring of educational data.

The use of Decision Support Systems (DSS) in educational communities is not a new concept (Fisher et al. 1990). Our platform shares all main characteristics of such systems (Marakas 1999; Shim et al. 2002), involving advanced data analysis, problem solving and strategic planning. Not all forms of interfaces are suitable for the great variety of the intended users of such an environment, ranging from school teachers and parents, to administrative personnel, decision makers and government officials. Our approach is based on the efficient collection of highly dynamic data from existing information systems, stores them in appropriate (redundant) format and further provides them for advanced processing and analysis to an OLAP (OnLine Analytical Processing) cube engine (Elmasri and Navathe 2010; O'Brien and Marakas 2009). No underlying knowledge on the various existing systems, menus, or data structure is required. All data are automatically linked in the way that educational dimensions dictate and advanced navigation tools allow for their dynamic exploration. So the end-user can effectively “browse” through authorized information stored in the warehouse with the use of a friendly graphical interface, by exploring data dimensions dynamically, drilling down to relevant information, creating reports and charts dynamically, identifying data patterns visually, etc. This allows decision makers to monitor the implementation of educational policy, identify administrative deficiencies and/or problematic patterns and trends at an early stage and opt for remedial actions.

The rest of the paper is structured as follows: Section 2 provides a brief background on the use of decision support systems in public administration, also related to recent eGov initiatives. In Section 3, we summarize the current status (platforms, problems, prospects) of the ICT infrastructure utilized by the Greek educational community and the main motivation and principles towards the envisioned eGov reform. Section 4 provides an insight on the main conceptual and technical aspects of the adopted solution so far. Finally, the paper concludes in section 5, where future plans are also discussed.

2. Related work

Decision support systems emerged mainly during the 1980s, acting as information processing systems, capable of manipulating large amounts of data, present them in a very efficient way, while at the same time being able to provide the end-user with advanced interactive characteristics. The basis is always a collection of data that are modeled appropriately, analyzed both qualitatively and quantitatively and finally, provide the user-decision maker with the necessary tools in order to perform the intended actions. Such kinds of system applications were firmly associated with eGov platforms in order to facilitate two major purposes (Wang 2009): The first was to gather and model sparse data for statistical purposes and a general overlook, while the second was to perform decision making based on simple or more complex mechanisms.

The development of DSS for eGov applications supposes the collection of data from various sources, where the logical and physical models could be heterogeneous. Additionally, these sparse data probably share different update and storage policies, while some important information might not even be dispensable. For this purpose, the scientific community proposes the creation of the so called *data warehouse* (Elmasri and Navathe 2010; Hillard 2010), which is a time variant collection of data stored in existing physical systems and other data sources, optimised for data retrieval and decision making analysis rather than routine transaction processing. The resulting data collection is not normalized and is most of the times highly redundant, but it is characterized by the advantage to provide imminently all the relevant data that are input to difficult decision making processing and in a centralized manner, while at the same time historical information is always available. Obviously, the data warehouse administrator is the responsible authority for providing up-to-date and correct data, a procedure that is highly tricky. The integrated data are subject to processing and reasoning in order not only to facilitate the decision making on the complex administrative problems that arise, but also provide instantly a general overview of the subject at any time. As it is already mentioned, the data warehouse is the basis, but the tools that are applied in order to extract the necessary knowledge from these data are the On-Line Analytical Processing (OLAP) tools, being the current trend to transform raw data to a multi-dimensional cube structure, which combines and associates various subjects and then generates specific queries that enhance the decision making, emerging correlations and compatibilities that are not obvious to the end-user (O'Brien and Marakas 2009). Additionally, several data mining algorithms can also be applied for the projection of events and trends based on the collection of data and the current status, in order to further facilitate the strategic planning (Ganguly et. al. 2007). In the eGov domain, several research efforts have employed the aforementioned blueprint for data integration and decision making solutions. For instance, in (Hongxia 2006; Kaihui 2008; Boreisha and Myronovych 2008) raw data are gathered from various external and internal sources to the administrative structure, and advanced OLAP techniques are applied in order to provide the authorities with the necessary information, which in turn perform the strategic planning and/or diagnostic actions rapidly.

3. Current ICT infrastructure in the Greek educational community

Having described the trends in related problems we are now setting the basis for the ICT infrastructure where the actual data are originated from. To this extent, the current ICT infrastructure utilized by the Greek educational community is a typical example of the so called "legacy systems" paradigm (Bispal et al. 1999), with the following inherent shortcomings:

- the infrastructure consists of heterogeneous systems, developed in different periods, in a fragmented way, to cover particular needs relevant to the particular period
- there is a great amount of data redundancy (therefore, serious threats for data integrity) among the different systems
- a user may have to resort to overlapping entries of the same information to various systems
- administrative tasks are not served optimally by the infrastructure at the conceptual level

The main consequence of the above is that overall, the ICT infrastructure of the educational community cannot serve as a decision support tool for the higher administrative level. Currently, the main operational information systems are the following:

- e-school: it is a typical client-server application. A client desktop application is installed in every school, handling the IT support of daily school operation (involving students, classes, events, school inventory, etc.). This application sends data asynchronously to a central data base at the ministry level. So far the penetration of the system to the target user group is low (~35% of schools).
- teachers' database: this a www application that stores teacher data, relating to their current status as well as historic data on their employment.
- survey: it is a typical www application that provides a brief profile of Greek schools currently, in the form of a classic www questionnaire. Data are static and schools update their profile periodically, whenever data collection is required by the higher administration levels. The advantage of this system is the high penetration level (~97%), while the disadvantages include its static nature (a school record is just the latest snapshot of several school parameters – no historic data are available) and its conceptual model: information is stored in the form of aggregate values of various parameters –e.g. number of students per class–, thus undermining data validity, as

opposed to a full-fledged administrative support system for every-day school operation, where all data should represent real-world entities (like individual students and teachers) and their interrelationships (classes, marks, final results, etc), which cannot be manipulated like plain arithmetic figures.

- payment system: it is a typical application that supports the payment of the teachers.
- temporary personnel database: this system is www-enabled and supports the selection and allocation of temporary personnel for various educational programs. Such personnel is administered under a distinct regulatory framework that bears similarities but also differences to the one applicable to the permanent educational personnel.

The above systems are physically, logically and conceptually isolated: a) at the database level the information is not always compatible, b) at the conceptual level, the systems support administrative procedures independently, neither optimally designed nor taking into account the overall infrastructure, and c) the physical H/W and S/W infrastructure is isolated, heterogeneous and administered by different teams. The result is a very low interoperability factor, which hinders significantly any type of advanced processing and reporting useful for decision making and planning.

During the last two years the Ministry of Education took many steps towards the modernisation of its IT infrastructure combined with a serious redesign of critical administrative procedures. These efforts lie at the core of its eGov reform strategy, whose main elements are described in the following Section.

4. The envisioned eGov infrastructure

The eGov framework as originally adopted is human-centric, having the student, teacher and parent at its heart. The purpose of any IT infrastructure that supports this framework is two-fold:

- to provide up-to-date information and added-value services, transparently to all the members of the educational community
- to support critical decision making through advanced data processing and analysis techniques

Two main actions with respect to the reorganisation of the IT infrastructure are currently in progress. The first aims at establishing an *interoperability* framework for the existing information systems through the following steps: a) the functional improvement, expansion and integration (both physical, logical and conceptual) of the systems described in the previous section in order to form a unified, stable infrastructure that supports effective everyday administration and provides consistent data to all administrative levels, when required - this includes the development of a www-service suite for the communication of relevant data outside the educational community systems, b) the development of a common interface which can provide advanced visualisation and analysis services on the existing data to the decision-making hierarchy.

The operational principles that underlie the utilisation of this infrastructure are the following:

- each information piece is entered once, wherever it is produced, by the authorised structure/user
- each user has access to the set of data he/she is authorised to view/modify, according to his/her role and level in the administrative hierarchy

Figure 1 outlines the foreseen system architecture. Obviously, the data warehouse has the centric role, gathering raw data, organizing and providing the end user with the required information. In the current implementation the data warehouse is dynamically built every night by collecting, cleaning, formatting and relating relevant data, which are hosted in the various information systems. In that sense, the warehouse contains, at a single access point, the wealth and power of data produced daily within the educational system, which are in turn subject to sophisticated analysis by recent state-of-the-art technologies. As mentioned in section 2, OLAP is such a technology, lying at the heart of the current data warehouse and school profiling interface. Technically speaking, OLAP technology provides large storage and great processing power for queries and analysis that are typically outside the scope of traditional relational systems. The underlying concept of data organisation in OLAP tools is the *data dimension*. A dimension is an aspect or projection of raw data, relevant to the real world application at hand.

For example, in our case, school-related data (student marks, etc.) are permeated by a *spatial* dimension (can be viewed in terms of a single school, a city's schools, a prefecture's schools, a

region's schools or a country's schools), a *temporal* dimension (projects to a didactic hour, a day, a semester or even a full academic year), a *lesson subject* dimension (ranging from particular subjects, to groupings like classical subjects and science, through the whole set of subjects of a school), a *grades* dimension, *gender*, *teacher specialty*, *teacher assignments*, dimensions, etc.

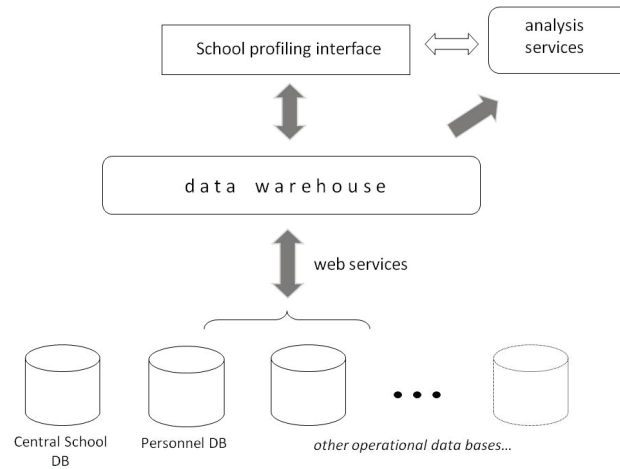


Figure 1: The general architecture of ICT infrastructure

Typically, the values of a dimension are hierarchical in nature (e.g. distinct schools are at the leaves of the spatial dimension, which are logically grouped to a tree like structure that resembles the administrative structure, containing the set of schools that are supervised by prefectural and regional administrative entities as intermediate nodes). As Figure 2 portrays, when we link together data of several dimensions, then an OLAP (hyper)cube is formed, as the Cartesian product of its constituent dimensions. Trying to further clarify, provided that we intend to examine a specific parameter (e.g. average student marks), then we can either explore the whole cube (i.e. calculate the average mark for all subjects of students of both sexes in the whole country) or *drill down* to a smaller cube (i.e. calculate the average mark for a particular subject of all the girls which are students in a certain prefecture) (Elmasri and Navathe 2010). Thus, OLAP technology allows the formulation of a single query that uniformly answers such questions, regardless the resolution at which we examine individual dimensions (traditional systems would require a separate calculation for each specific instance of the query).

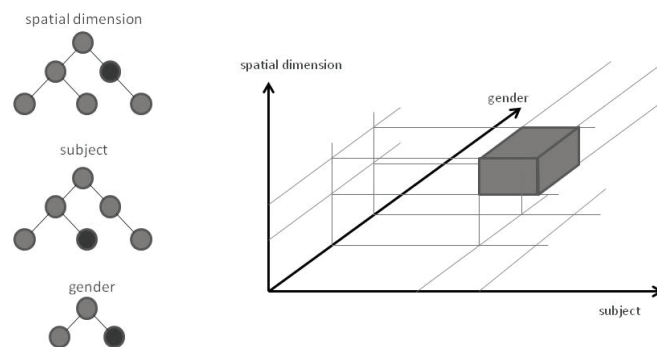


Figure 2: Example of an OLAP cube

In essence, the school profiling interface is an advanced visualisation environment (an indicative screenshot is depicted in Figure 3) that retrieves data from the warehouse and allows the end-user to: a) browse several statistics and other aggregate information, educational parameters and calculated indices, b) create dynamic reports in various common formats (.xls, .ppt, etc.) c) navigate through multiple representations and drill down (or up) to the appropriate resolution of the information required - for example a graph or table presenting student data for a region can be “clicked” in order to hyperlink to a new graph containing the same information for the individual prefectures this region consists of, or even down to the school level, d) navigate through several linked dimensions just with a sequence of “clicks” (e.g. starting from examining different school types, *drilling through* to the teacher specialties, which are related to a particular school type, then drilling through to in-school assignments of teachers of a particular specialty and finally reaching a specific teacher with the characteristics we have in mind, checking contact details of the teacher or his/her school principal and

even contacting him/her). The latter is provided by a powerful tool, called “decomposition tree” (as is illustrated in Figure 4), which visually presents our navigation path along with relevant values at each point of our data exploration, reaching even down to actual database records.

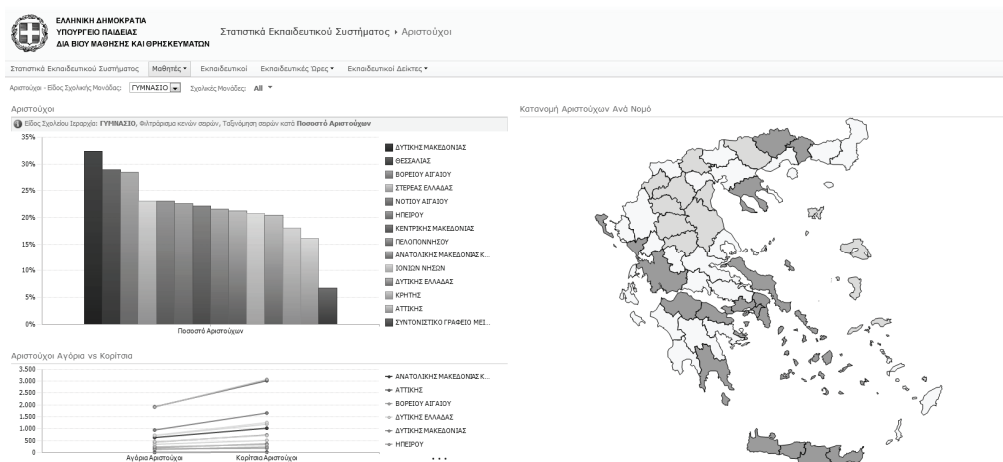


Figure 3: Example of a multi-representational interactive graph

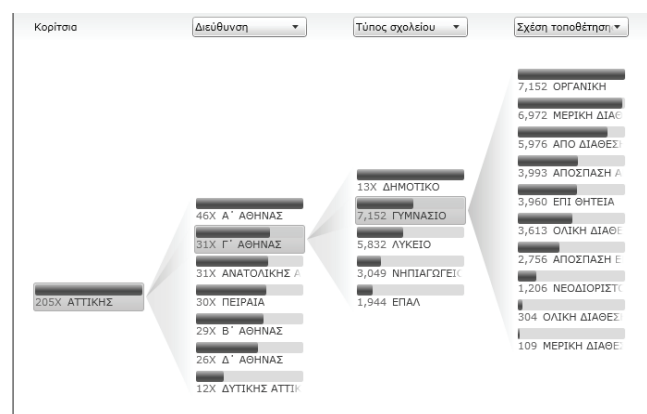


Figure 4: Example of a decomposition tree

With regards now to the general layout of this interface, the basic characteristic and its major advantage at the same time, is that it is fairly simple, containing a typical drop-down menu providing several pre-designed forms that depict basic parameters/indices, serving as starting points for further navigation through the various datasets, along with a set of selection filters at the top of the screen to further constrain the initial dataset. Additionally, a central frame provides the end-user with the ability to handle multiple forms portraying data in interactive tabular or common graphical formats (graphs, pies, cumulative graphs, etc.). To allow for easy exploitation and circulation of the extracted information, several exporting options of every visible element to common formats (.doc, .xls, .ppt, etc.) is also available. Finally, the “right click” options implement the access to advanced navigation tools, like drill down, drill through, or the decomposition tree tool mentioned above.

It is evident that the main contribution of this environment is its ability to abstract away details of the underlying information systems that populate the warehouse, pertaining to individual interfaces, data models or information structures. Moreover, even the non-expert users have a uniform interface which is powerful enough to allow for almost any dynamic data visualisation and navigation. Various triggers are also built-in so that any data value set that exceeds specified ranges can be handled with different colours, shapes or controls, so that undesirable or peculiar patterns can be effectively identified at any level. Finally, a set of algorithms which calculate optimal teacher vacancies according to the available school data is coupled to this interface and will be reclaimed by the administrative authorities in this academic year. For this purpose, the end-user can experiment with various class sizes and thus assess multiple scenarios of teacher allocation, increasing the flexibility of the whole procedure. Technically, the profiling system has been implemented by employing diverse data sources, which are integrated using the Microsoft SQL Server 2008 R2, while the profiling system’s user interface is built using the Sharepoint 2010 environment (and the incorporated Sharepoint Designer 2010). The OLAP

cube is built, compiled and updated using the Microsoft Business Intelligence suite (BI studio), while finally, the data aggregation that formulate the data warehouse is performed by properly designing and implementing a scheduled operation as a Microsoft Integration Services instance, which performs data collection, manipulation and ensures that the environment shares always up-to-date information and facts.

5. Conclusions

During the last few years the Greek Ministry of Education has acknowledged the departure from its legacy IT infrastructure and embraced a wide eGov reform that pertains not only to its IT infrastructure but also to the main administrative and regulatory framework. In this paper we summarised the first efforts towards an open, flexible and collaborative IT environment that provides quality data and services to the educational community. This venture has two main goals, a) to enrich and integrate the existing information systems in order to establish a modern interoperable IT environment, and b) to provide advanced tools and a common interface which would collectively serve as a decision support mechanism for strategic planning and educational administration. The former goal has still a long way to go but there is strong evidence that our efforts are on the right path and are embraced by the educational community. As for the latter, a prototype interface is currently available, offering advanced visualisation and navigation capabilities for data automatically collected and stored in a large data warehouse. We have experimented extensively with OLAP technology and proved that the available techniques suit perfectly the strict hierarchical structure of the Greek educational system and its inherent dimensions. Our immediate plans include a) the deployment of a full-fledged GIS (Geographic Information System), closely coupled to our school profiling interface. Initially, the GIS will undertake the presentation of various educational parameters and indices in the form of cartographic layers and eventually we hope to be able to apply and present proper spatial analysis (like school location scenarios, spatial correlations, spatial querying, etc.) based on the available datasets. As often observed in ICT practice, eventual success or failure is determined mainly by human rather than technical factors. A study of critical success factors in the adoption of decision support systems is due so that feedback from the educational community will be received and assist us to fine tune our design decisions.

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References

- Bispal, J., Lawless, D., Wu, B. and Grimson J. (1999) “*Legacy Information Systems: Issues and Directions*”, IEEE Software, Vol. 16, No 5, pp. 103-111.
- Boreisha, Y. and Myronovych O. (2008) “*Web-based Decision Support Systems as Knowledge Repositories for Knowledge Management Systems*”, Ubiquitous Computing and Communication Journal, Vol. 33, pp. 22-29.
- Elmasri, R. and Navathe, S.B., (2010) *Fundamentals of Database Systems*, 6th edition, Addison Wesley.
- Fisher, J.C., Semrau, P., and Turban, E. (1990) “*Decision Support Systems in Elementary and Secondary Educational Administration*”, School Organisation, Vol. 10, No 1, pp. 91-105.
- Ganguly, A.R., Gupta, A., and Khan, S. (2007) “*Data Mining Technologies and Decision Support Systems for Business and Scientific Applications*”, Intelligent Information Technologies: Concepts, Methodologies, Tools, and Applications (4 Volumes), IGI Global, Hershey PA, USA, pp. 233-238.
- Hillard, R. (2010) *Information-Driven Business How to Manage Data and Information for Maximum Advantage*, John Wiley & Sons, USA.
- Hongxia, W. (2006) “*The decision support system for EGovernment affairs based on data warehouse*”, Information Studies: Theory & Application, Vol. 29, pp. 361–363.
- Kaihui C. (2008) “*Government decision support system design based on electronic government affair platform*”, Journal of Yulin Normal University (Natural Science), Vol. 29, pp. 137–140.
- Marakas, G. M. (1999) *Decision support systems in the twenty-first century*, Prentice Hall, Upper Saddle River, N.J., USA.
- Nutt, P.C. (2006) “*Comparing Public and Private Sector Decision-Making Practices*”, Journal of Public Administration & Research Theory, Vol. 16, No.2, pp. 289-318.
- O'Brien, J. A., and Marakas, G.M. (2009) *Management information systems* (9th ed.), McGraw-Hill/Irwin, Boston, MA.
- Shim, J.P, M. Warkentin, Courteny, J.F., Power, D.J., Sharda R. and Carlsson C. (2002) “*Past, Present, and Future of Decision Support Technology*”, Decision Support Systems, Vol. 33, pp 111-126.
- Wang S. (2009) “*Application of Decision Support System in EGovernment*”, International Conference on Management and Service Science, Beijing, China, September.

The State of Open Government Data in GCC Countries

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Abstract: Three countries of the Gulf Cooperation Council (GCC) (i.e. Bahrain, Saudi Arabia, and United Arab Emirates (UAE)) have launched official Open Government Data (OGD) initiatives and started offering public data openly on their national portals. These initiatives are part of a new phase of the eGovernment programs in these three countries. This case study explores and compares the current status of these initiatives in an effort to understand the key driving forces behind launching the initiatives, the countries' approach to launching and managing them, the major challenges facing them and their plans to overcome them, and their future plans for sustaining and improving their open data initiatives. We also use data from interviews with the government officials in charge of these initiatives in Saudi Arabia and UAE to evaluate how these countries perceive the Open Government Partnership (OGP) as an example of a key global OGD initiative. Our analysis showed similarities in the countries' motivations to open up their governments, driven by the potential economic returns. We found that the current status of these countries' OGD portals (in terms of richness of the published data and its strategic value) does not match the desired standards. Although the studied countries follow different approaches in managing their OGD initiatives, they face the common challenge of poor cooperation between government agencies, which is mainly caused by cultural barriers, variations in agencies' readiness, a lack of necessary policies and legislation, and uncertainties about the value of OGD for these agencies. To overcome these challenges, and to improve and sustain the OGD initiatives over the long term, we offer the following specific recommendations: develop a national OGD strategy to align OGD activities with the overall national agenda, build a framework that clearly defines the major components of OGD, such as the roles and responsibilities of government agencies and other stakeholders, and all aspects related to data gathering and publishing on the portals. We also recommend building up an open data community across government and non-government sectors to act as a platform for exchanging OGD knowledge and practices. In addition, we recommend expending more effort to fill the legislation gap, adopt and adapt international practices, and promote continuous learning and development.

Keywords: open government data, UAE, Bahrain, Saudi Arabia, eGovernment

1. Introduction

In his first day in office on January 21, 2009, President Barack Obama issued the Open Government Initiative directive, which identified the three open government principles of transparency, participation, and collaboration and confirmed that openness will strengthen democracy and promote efficiency and effectiveness in government (The White House, 2011). The directive set deadlines for US federal agencies to publish government information online, improve the quality of government information, and create and institutionalize a culture of open government. A few weeks later, the first version of Data.gov portal went live with 76 data sets and tools from 11 government agencies (Lakhani, Austin and Yi, 2010).

Since then, many similar OGD initiatives have been launched in several countries and jurisdictions around the world. This global move towards open government practices reached a major milestone in September 2011 with the launch of the OGP, which is "a global effort to make governments better" (Open Government Partnership (2011)). The partnership was founded by eight countries; since then, more than 40 countries have announced their commitment to join (Open Government Partnership, 2011).

Another major global OGD milestone took place in December 2011 when the European Commission launched the OGD strategy for Europe, which is expected to generate a €40 billion boost to the EU's economy each year (Digital Agenda for Europe, 2012). That's why Neelie Kroes, Vice President of the European Commission, who is responsible for the Digital Agenda for Europe, called OGD the "new oil" (Nicolas, 2012).

The European Commission defines OGD as "all the information that public bodies in the European Union produce, collect or pay for. This could include geographical data, statistics, meteorological data, data from publicly funded research projects, and digitised books from libraries" (Europa, 2011). Public data is considered open only when it "can be readily and easily consulted and re-used by anyone with access to a computer" (Europa, 2011).

2. Background

Bahrain, Saudi Arabia, and UAE are three of the six countries that constitute the GCC in the Middle East. They are high-income countries with various population sizes, as shown in Table 1. The tech-based public sector modernization in these countries, and in the GCC region in general, started decades ago with various levels of success and sustainability. However, official national eGovernment programs in these countries were established only a few years ago with the launch in 2000 of the Dubai eGovernment of the local government of Dubai in UAE (Mishra and Mukherjee, 2005). The launch of OGD initiative in the three countries represents a new era in the development of their eGovernment programs. Within a few years, regional and international bodies such as the Arab Administrative Development Organization (ARADO), the United Nations Department of Economic and Social Affairs (UNDESA), and the World Summit Award have recognized the growing successes of these eGovernment programs.

Table 1: Country profile of Bahrain, Saudi Arabia, and UAE

	Bahrain	Saudi Arabia	UAE
Population*	1.3 million	27.5 million	7.5 million
GDP per capita (USD)*	17,609	15,836	39,625
Income level*	High income	High income	High income
Rank in UN eGovernment Development Index (2012)**	36	41	28

* Source: World Bank, 2012

** Source: United Nations Department of Economic and Social Affairs (UNDESA), 2010

In Bahrain, the eGovernment program was officially launched in 2007 under the eGovernment Authority (eGovernment Authority, Kingdom of Bahrain, 2011). Since then, Bahrain eGovernment achievements have been recognized on several occasions regionally and internationally. They program received two United Nations Public Service Awards: one for improving transparency, accountability, and responsiveness in the public service through its eGovernment portal, and the other for advancing knowledge management in government by building the National Enterprise Architecture Framework (eGovernment Authority, Kingdom of Bahrain, 2011).

The eGovernment program in Saudi Arabia was established in 2005 under the name of “Yesser”. It is managed by the Ministry of Communications and Information Technology in conjunction with the Ministry of Finance and the Communication and Information Technology Commission (eGovernment Program, 2011). Saudi Arabia won the United Nations Public Service Award in 2008 for its national payment gateway (SADAD) (eGovernment Program, 2011).

The story of UAE is slightly different, since it is a federation of seven emirates with a federal government of over 50 entities, most of which provide services to the public. Each of the seven emirates has its own local government, and the complexity and available resources vary between the emirates (Elbadawi, 2011).

The federal eGovernment program is run by Emirates eGovernment, which is under the auspices of the Telecom Regulatory Authority. The federal online portal (government.ae) is the official UAE government portal. In addition to the federal eGovernment, several local governments (e.g. AbuDhabi.ae, Dubai.ae, and rak.ae) have their own local e-Government programs. The country was named an “Emerging Global Leader” in eGovernment by the United Nations eGovernment Survey for 2012 (UNDESA, 2010), the same survey ranked UAE 28th globally and 1st in the Arab region in the eGovernment Development Index. In 2011, Emirates eGovernment published the Social Media Usage Guidelines for government entities, which were the first of its kind in the region. Also in the same year, government.ae was chosen as the best national portal in the GCC eGovernment Award and won ARADO’s “Best Strategic Website” award (Emirates eGovernment, 2012).

3. Literature review

Lathrop and Ruma's book "Open Government: Collaboration, Transparency, and Participation in Practice" (2010) is widely cited in the field of open government. It presents a detailed explanation of the "government as a platform" concept and provides a compilation of essays and case studies on transparency and community collaboration and participation.

Wilson and Linders (2011) assess the 2009 Open Government Directive and the open government plans put in place by the government agencies to identify the drivers, trends, and challenges in establishing this posture. The assessment is conducted within the context of the existing legislative measures, and the authors suggest that future research should focus on the perspectives of society, policy, and technology.

Lakhani and colleagues (2010) studied the data.gov initiative in the United States and offered a detailed description of the initiative's background and Viveck Kundra's approach in building this portal. The authors discuss the various challenges involved in the launch and evaluate the growth of the portal from different perspectives such as legal, political, and technical challenges. Harrison and others (2011) place open government in the context of eGovernment and assess its broader impact on the future of public administration. They analyze how the democratic practices of transparency, participation, and collaboration work in the administrative agencies and suggest that – because the goal of public organizations is to create public value – these practices should be considered instrumental attributes of administrative work rather than objectives in themselves. Lee and Kwak (2011) proposed a four-stage model for governments to use to implement open government initiatives: increasing data transparency, improving open participation, enhancing open collaboration, and realizing "ubiquitous engagement". Zheng (2007) discusses China's 2007 Open Government Information Regulation; this study examines the political, economic, and administrative motivations for enacting this regulation and explores the potential legal, institutional, administrative, social, and economic barriers to its implementation.

To date, no studies have focused on the open government initiatives in the GCC countries, to the author's knowledge.

4. Research purpose and methodology

This case study explores and compares the OGD initiatives of Bahrain, Saudi Arabia, and UAE in order to answer the following questions:

- What are the key driving forces for opening up government in these countries?
- What approach did each country follow to initiate and manage its OGD initiative?
- What are the key challenges facing the OGD initiative in each country? What are the plans to overcome them?
- How does each of these countries perceive the OGP, in light of their local priorities and practices?
- How will these countries sustain and enrich their OGD practices in the future?

The data was primarily derived from email interviews with the government officials in charge of these initiatives and reviews of the three online portals. Quantitative and qualitative techniques were used to analyze the collected data.

5. Findings and discussion

The interview questions mainly focused on assessing the OGD initiatives at the strategy and policy levels. In order to link the strategy and policy to implementation, we will analyze the feedback in light of our review of the online OGD portals of these three countries. Since Bahrain eGovernment Authority did not answer our questions, our analysis relies on our evaluation of its OGD portal.

An overview comparison of the three portals will consider the following points; Table 2 illustrates our findings of this overall comparison:

- Portal positioning: is it a sub-portal within the national portal or a separate portal?
- Portal design: does the OGD portal act as a warehouse, where the data sets are stored on the portal itself, or as an index to the data sets at various government agencies' websites?

- Data format: is the data presented wholesale (raw data) or retail (data context is explained and interpreted)?
- Metadata: to what extent are the datasets supported with metadata (i.e. information about the datasets)?
- Datasets formats: in what formats are the datasets provided (e.g. database files, spreadsheets, etc...)?
- Datasets quantity and presentation: how many datasets are currently published? How are they presented?
- Participation mechanisms: does the OGD portal enable public participation (e.g. sharing and discussing suggestions and ideas)?
- Collaboration mechanisms: does the portal enable collaborative work (e.g. through crowdsourcing techniques) to solve challenges and issues or to further improve the portal itself?

Table 2: Comparison of OGD portals of Bahrain, Saudi Arabia, and UAE

	Bahrain	Saudi Arabia	UAE
Authority	eGovernment Authority	eGovernment Program (Yesser)	Emirates eGovernment
Portal URL	www.data.gov.bh	www.saudi.gov.sa	www.government.ae
Portal positioning	Separate portal	Sub-portal	Sub-portal
Portal design	Warehouse	Index	Warehouse
Data format	Wholesale		
Metadata	Very poor usage of metadata. In Saudi Arabia's portal, a dataset is described only by its name and the source government agency. UAE's portal adds to this the date and available file format(s). Bahrain's portal adds the date, file format, and data category.		
Dataset formats	PDF for the majority of the datasets, MS Excel for some	MS Excel	XML, MS Excel, MS Word, PDF
	Bahrain	Saudi Arabia	UAE
Dataset presentation and quantity	251 datasets categorized into 23 domains (e.g. health and education)	Hundreds of datasets categorized into 15 domains	A pool of 63 datasets
Participation mechanisms	Public can suggest ideas or new datasets but no discussion or rating mechanisms are available. No clear policy for managing these suggestions.	No participation or collaboration mechanisms are available on the open data portal.	Public can suggest ideas or new datasets but no discussion or rating mechanisms are available. No clear policy for managing these suggestions.
Collaboration mechanisms			

As Table 2 shows, with the exception of data format, the three countries don't follow the same approach in managing any of the other items of comparison. More detail will be provided below, but one key observation that should be pointed out here is that the majority of the datasets published on Bahrain's OGD portal are available in PDF format only. According to the definition and features of OGD (Digital Agenda for Europe, 2012), PDFs cannot be considered open data because their format makes it difficult for the public to consult or reuse the data. Ironically, offering the data in PDF format violates the primary objective of the portal as declared on the portal itself, which is to "publish

datasets from ministries and government agencies in an easily manipulative format such as spreadsheets” (eGovernment Authority, Kingdom of Bahrain, 2011). This situation could compromise the value of the entire portal; because of the unavailability of feedback from the Bahrain eGovernment Authority, we have no official explanation for this observation.

The following section will discuss the answers provided by the eGovernment authorities in Saudi Arabia and UAE. We will discuss these findings in light of the status of their portals as provided in the overall comparison above.

5.1 Key driving forces

Boosting the economy and attracting foreign investment are common driving forces for OGD initiatives in both UAE and Saudi Arabia. UAE has another unique reason to open up its government data according to Mr. Salem Al Shair Al Suwaidi, Director General of Emirates eGovernment, who stated in an interview on December 25, 2011 that the portal's goal is: “encouraging and reinforcing public engagement and interaction.”

However, there is a noticeable gap between these ambitious goals and the quantity and quality of the published data on the OGD portals in both countries. Basic economic and fiscal data are either not available or not updated. In some cases they are presented in PDF format, the problems of which are discussed above. On Saudi Arabia's portal, the “government budget data” for 2010 sheet is blank and only partial government budget items (i.e. first chapter, revenue, and expenditure) are available for the year 2009 and the previous few years. Economic indicator data are available on another website (Ministry of Economy and Planning), but it is not reachable from the open data page on the national portal. However, this is better than the UAE's portal, in which the only budget data is the 2008 budget for the Ministry of Health. The Bahrain portal offers a single PDF document under the “National Accounts” category; this document is not reachable through other relative categories such as “Economy”. In terms of the quantity of published data, Saudi Arabia has more published datasets than UAE and Bahrain. However, Bahrain has better categorization while UAE offers the datasets in a wide variety of formats.

Furthermore, the poor public participation and collaboration mechanism on the UAE portal needs to be further improved to spur public participation and engagement.

The significant misalignment between the purpose of the OGD and its execution on the portals is mainly caused by the lack of a clear OGD strategy and action plan. Such a strategy would offer the necessary guidance to decide what data the government should publish, and how, as we will suggest in the recommendation section of this paper.

5.2 Management approach

Saudi Arabia's approach focuses on providing data on the national portal and the website of the Ministry of Economy and Planning. UAE follows a somewhat different approach, in which open data are presented on the websites of various federal government agencies (e.g. Ministry of Social Affairs and Emirates Identity Authority) in addition to the central open data section of the national portal. The OGD section of Saudi Arabia's national portal is designed as an index to other government websites where the data is actually stored, while UAE's portal is built as a warehouse.

The UAE's decentralized approach can make the OGD more accessible, but because the open data section is built as a warehouse, this approach raises the serious challenge of keeping the data on these different websites updated and synchronized. Developing an OGD framework can help the both countries (in addition to Bahrain) decide on the most appropriate way to publish and manage their public data. More details about such a framework are provided in the recommendation section.

5.3 Promoting OGD practices

UAE and Saudi Arabia follow totally different approaches. In Saudi Arabia, according to an interview with an official from the Yesser program on December 31, 2011, the Ministry of Economy and Planning is “fully authorized to request information from any agency”. UAE, on the other hand, targets the government sector and the public with promotional campaigns and activities to publicize the OGD practice and culture.

These two approaches are not mutually exclusive. In fact, a holistic approach that incorporates those two methods – in addition to other items – would be more beneficial in achieving OGD objectives. Empowering a single government agency with the necessary mandate to initiate and manage the OGD initiative would encourage other government agencies to join the initiative and publish their data; however the mandate alone is not enough. Educational and awareness efforts should be made to communicate the OGD message and promote its practices and culture. This situation can be clearly observed in the case of Saudi Arabia, where the number of published datasets is relatively large but of low strategic value.

In addition, the promotion of OGD should go beyond the public sector and aim to build up an OGD community that brings together various stakeholders including private sector companies, not-for-profit organizations, researchers, academic institutions, etc. Developing such community would enrich the OGD initiatives and increase their chances to grow and sustain over the long term.

5.4 Key challenges

The OGD initiatives in both Saudi Arabia and UAE face the challenge of poor cooperation between government agencies (the mandate in the case of Saudi Arabia has helped to improve this situation). Key reasons for such poor cooperation as identified by UAE include cultural barriers, variations in agencies' readiness, a lack of necessary policies and legislation, and uncertainties about the value of OGD for these agencies.

These challenges confirm the importance of our suggestion to take a holistic approach to tackling the OGD initiative. Such an approach should offer these countries the opportunity to create a clear plan to address all these issues that hinder their progress in implementing the OGD initiatives.

5.5 Perception of OGP

Neither Saudi Arabia nor UAE has applied to join the OGP, and neither has plans in place to join the partnership. However, both countries have expressed their openness towards the OGP agenda. International practices like OGP, the EU Digital Agenda, and the OG initiative in the US offer very valuable sources of experience and practices that should not be neglected. The careful adaptation of an international approach that takes the local context into account should help these countries benefit from these practices.

5.6 Future plans

The key future plan for both Saudi Arabia and UAE is to launch a full portal dedicated to OGD. Considering the current status of OGD initiatives in these two countries, we consider this a very natural and reasonable step. Our recommendations presented below could be considered in developing these future plans.

To summarize, we can generally say that the three countries have high expectations for the return of their OGD initiatives. The current status of their portals represent a very good start but much work needs to be done to further improve these portals to live up to these ambitious expectations. The set of recommendations provided in the next section can be considered for this purpose, the suggestions also cover issues related to the management of OGD initiatives as identified in our analysis.

6. Conclusion and recommendations

In this case study, we explored and compared the OGD initiatives in three GCC countries: Bahrain, Saudi Arabia, and UAE. The initiatives were launched as part of the eGovernment programs in these countries and managed by the government agencies in charge of this program. An email interview with government officials in charge of these initiatives was used to collect feedback on the key research questions. We compared the current status of the three OGD portals in terms of portal positioning, portal design, data format, metadata, data set format, and data set quantity and presentation. This information was used to analyze the collected interview feedback, which focused mainly on the strategy and policy levels of the initiatives.

Based on our analysis and findings, we offer the following set of specific recommendations for further improvement of these OGD initiatives:

6.1 Develop an OGD strategy

None of the three countries have a documented and communicated strategy for their OGD initiatives. Although all of them communicated the high-level objectives of having an OGD portal (either via the interview or on the portal itself), each lacks a consolidated strategy that puts the OGD initiative into the national context (political, economic, social, etc...). The strategy should have specific short- and medium-term action plans with specific timelines to implement the OGD initiative. Such a strategy would have many benefits, the most important of which would be the communication of a unified message to all OGD stakeholders that would encourage them to contribute to the initiative's success. In addition, the strategy is essential to making the OGD initiative sustainable over the long term.

6.2 Develop an OGD framework

The framework should provide the government sector and all stakeholders with the necessary specific information on how the OGD initiative is managed on different levels (e.g. strategy, policy, and technical levels). Key components of the framework include: definition of "open government data", roles and responsibilities of government agencies and other stakeholders, and all aspects related to the implementation of the OGD portal including the items highlighted in Table 2. In addition, the framework should clarify how the portals should be leveraged to empower citizens and stimulate public participation and collaboration.

6.3 Identify and fill up the legislation gap

Depending on the local context of each country, certain laws and legislations that deal with issues related to OGD (e.g. the citizens right to know) might be missing or in need for update and review. This exercise should be tackled to provide the OGD initiatives with the required legislation umbrella.

6.4 Build up and sponsor an open data community

The three initiatives have not showed a clear effort to collaborate with stakeholders outside the public sector who might be targeted by OGD initiatives or interested in them. Such stakeholders include mainly private sector companies, not-for-profit organizations, academic institutions, and the public. Building this community is essential for the sustainability of the initiatives and for delivering their intended benefits.

6.5 Adopt and adapt international practices

The three countries should seriously consider learning from the available international and regional OGD practices to benefit from and exchange experiences. The OGP, the EU's Digital Agenda, and the US Open Government Initiative are some examples. However, the local context should never be overlooked.

6.6 Learn and evolve, continuously

OGD should be considered an endless journey, not a project. This way, eGovernment programs in these countries can continuously capture and learn from the lessons they gain. When this continuous learning practice is merged with the previous recommendations, the OGD initiatives in these countries will have a rich pool of experiences and resources to support the sustainability of their OGD practices.

References

- The World Bank (2012), [online], <http://data.worldbank.org/> [14 Dec 2011].
- Digital Agenda for Europe [online], http://ec.europa.eu/information_society/digital-agenda/index_en.htm [5 Jan 2012].
- eGovernment Authority, Kingdom of Bahrain (2011), [online], <http://www.ega.gov.bh> [22 Dec 2011].
- eGovernment Program (2011), [online], <http://www.yesser.gov.sa> [22 Dec 2011].
- Elbadawi, I. (2011) "Cloud computing for e-government in UAE: opportunities, challenges and service models", Proceedings of the 5th International Conference on Theory and Practice of Electronic Governance, Tallinn, pp 387–388.
- Emirates eGovernment (2012), [online], <http://emiratesegov.ae> [21 Dec 2011].
- Europa (2011), [online], <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/11/891> [11 Jan 2012].
- Harrison, T., Guerrero, S., Bruke, G. and Cook, M. (2011) "Open Government and E-Government: Democratic Challenges from a Public Value Perspective", Proceedings of the 12th Annual International Conference on Digital Government Research, Maryland, pp 245–253.

- Lakhani, K., Austin, R. and Yi, I. (2010). Data.gov [Electronic], 9-610-075, [online], <http://www.hbr.org> [31 Dec 2011].
- Lathrop, D. and Ruma, L. (2010) *Open Government: Collaboration, Transparency, and Participation in Practice*, in O'Reilly, California.
- Lee, G. and Kwak, Y. (2011) "Open Government Implementation Model: A Stage Model for Achieving Increased Public Engagement", Proceedings of the 12th Annual International Conference on Digital Government Research, Maryland, pp 254–261.
- Mishra, S. and Mukherjee, A. (2005) "E-governance in Developing Nations", in Al Shair, S and Geray, O. (eds) *Dubai eGovernment Initiative: Concept, Achievements and the Future Pillars of Success*, New Delhi, ICFAI.
- Nicolas, L. (2012) "Neelie Kroes: Information is the new oil", [online], <http://www.thenewfederalist.eu/Neelie-Kroes-Information-is-the-new-oil,04732> [9 Jan 2012].
- The White House Open, Government Initiative [online], <http://www.whitehouse.gov/Open> [24 Nov 2011].
- Open Government Partnership (2011) [online], <http://www.opengovpartnership.org/> [2 Dec 2011].
- United Nations Department of Economic and Social Affairs (UNDESA) (2012) *United Nations E-Government Survey 2012: e-Government for the People*, New York, United Nations Publications.
- Zheng, L. (2007) "Enacting and Implementing Open Government Information Regulations in China: Motivations and Barriers", Proceedings of the International Conference on Theory and Practice of Electronic Governance, Macao, pp 117–120.
- Wilson, S. and Linders, D. (2011) "The Open Government Directive: A Preliminary Assessment", Proceedings of the iConference, Seattle, pp 387–394.

Citizens' Perception of the Egyptian eGovernment Portal After Revolution

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Abstract: The internet played an important role in the Egyptian revolution through the social networks such as face book and other applications. Internet applications become more essential day after day specially in some developing countries such as Egypt, UAE and Tunisia. Number of Egyptian researchers discussed the eGovernment issue in the context of local channels. This study is *conducted to include an improved understanding for citizen's perception regarding their eGovernment web portal* after the Egyptian revolution. The shortage of related research conducted in Middle Eastern countries in general plus the increased responsibility towards Internet applications are concerned as good reasons to conduct this research. This *article demonstrates the results of a survey on e-participation in Egypt* and what is the perception of Egyptian citizens regarding the eGovernment. This survey will *measure the eGovernment services in Egypt*; this will be through a questionnaire demonstrating citizen's perception regarding their electronic government portal. Moreover, this survey was used before the Egyptian revolution in 2009 and published in the 10th European Conference on eGovernment held in Ireland. The questionnaire will contain 5 main concepts (utility, reliability, flexibility, customization and efficiency). In addition, the questionnaire will contain 2 main sections (personal data and using technology). Concerning the five main constructs part, questions will be coded directly to 1 to 5. This part will use the Likert scale (likert scale is designed to measure how strongly subjects agree or disagree with statements on a five point scale). The result for coding the questionnaire will be 51 variables; all of them are coded 1 to 2, 5, 6 or 7. Number of respondents is 560. Around 75% of respondents are between 20 and 35 years old and 21% are under 20. The respondents opinions will produce statistical results that show emotional measures, capturing five constructs (utility, efficiency, flexibility, reliability and customization). The survey will demonstrate to what extent the participants are satisfied with the eGovernment portal. Just 25% are considering eGovernment portal as a flexible tool on the other hand majority of respondents have good impression about the eGovernment portal's utility.

Keywords: eGovernment, ease of doing business, public services and citizens

1. Introduction

The current study plan is to evaluate electronic government services and citizen satisfaction with eGovernment environment in Egypt. In addition, it will demonstrate and evaluate the main eGovernment services in Egypt. Plus, it will add to a part of knowledge in the area of eGovernment solutions in Egypt especially after the revolution.

1.1 Motives to conduct the study

A lack of surveys (conducted in the Middle East) discussing citizen's perception concerning eGovernment solutions is a fine reason to perform this study. The paper also demonstrates the outcomes of a survey on electronic public service in Egypt and what is the impression of Egyptian citizens concerning their eGovernment program.

The study is not appropriate exclusively for Egypt or the Middle Eastern countries; it is expected that outcomes could also be used in developed countries to increase their public service performance. More precisely, better understanding of citizens perception regarding eGovernment portals might increase the usage of those portals. This increase could positively affect the perform of business processes. For instance, an improvement of starting a business indicator by the citizens usage of eGovernment came from Serbia. In May 2004 registration was simplified and agencies linked through a central electronic database, which checks the authenticity of data. The previous service ensures automatic registration within 5 days.

In the same indicator, eGovernment solutions played an important role in improving the level of service in New Zealand. It is easier to register property there than anywhere else in the world and the entire process can be completed in two online procedures.

1.2 Causes of choosing Egypt for this study

Egypt performed very well in 2005 advancing 37 points in the global ranking of eGovernment readiness from 136th in 2004 to 99th in 2005. EGovernment Readiness Report published by the United Nations (2005). In addition, In 2008 Egypt advanced 20 points to get the 79th rank.

eGovernment Readiness Report (2008). Also the economy of Cairo was ranked first in the Middle East, and 43rd globally by Foreign Policy (2010). On the other hand, around 70 countries obtaining a construction permit takes more time than the actual construction, which points at the importance of using eGovernment services in order to facilitate such processes. Several of these countries are in Africa, which accounts for more than 5 of the 10 countries where it is most difficult to build legally, and one of those 5 is Egypt. Doing Business Report (2007). Nevertheless, Egypt performed better in 2011; it advanced to the 154th rank.

The city of Cairo has a population of about 20 million people; it is also the most populous metropolitan area in Africa. In addition, it is one of the fifteen busiest cities in the world. A citizen of Cairo might need to obtain a birth certificate or renew a car licence. The previous process should be accomplished by visiting the public service authority. Instead of spending time in traffic jam and crowded roads, it is the time for using eGovernment services to save time, effort and money.

1.3 Aim and objectives

The major aim of this study is to include an understanding of eGovernment processes one of the Arabian African countries. The *specific objective is to demonstrate and test the major eGovernment services in Egypt, in term of their public provision.*

The intended study could be considered as exploratory because not much is known about the situation at hand. As mentioned before there is a lack of eGovernment research in the Middle East; therefore this study does not have enough information to start. As a result, an establishing questionnaire was needed to answer the research question which is what is the Egyptian citizen's perception regarding the Egyptian eGovernment portal? The participants would give their opinion regarding eGovernment portal performance in Egypt.

2. Literature review

Although some Arabian countries such as UAE, Kuwait and Jordan performed well in 2008 according to eGovernment Readiness Report (2008), however much of the existing research focused on eGovernments in developed countries in the Western countries. On the other hand, very little is known about eGovernment development efforts and current developments in Arab countries (Chatfield and Alhujran, 2007a). However, some studies presented a review of eGovernment initiatives in Gulf countries (Kostopoulos, 2004; Pons, 2004; Sahraoui, 2005). Others did so in a single country background (e.g., Abusin, 2007; Almahandi, 2004; Al-shehry et al., 2006; Ciborra and Navarra, 2005; Zaied et al., 2007). Catfield and Alhujran (2007) classified Arab countries into the following three groups based on their progress in term of eGovernment service delivery capabilities: Arab eGovernment leaders (UAE, Bahrain, and Qatar); Arab eGovernment up-and-coming (Jordan, Lebanon, Kuwait, Egypt, Saudi Arabia, Morocco, Tunisia, Algeria, Oman, and Syria; Arab eGovernment laggards (Yemen, Iraq and Sudan).

In the last study, the author based his categorization upon the eGovernment service delivery capabilities provided to the public. The Arab eGovernment leaders delivered advanced eGovernment service capabilities to their citizens, including e-democracy facilities. The Arab eGovernment up-and-coming group, in which most of the Arab countries are clustered, is also offering some promising or innovative eGovernment service delivery capabilities to the public. In contrast, the Arab eGovernment laggards group offers the public limited information content and eGovernment services.

Regarding citizens' adoption, a small number of eGovernment adoption studies have been undertaken in the Arab world. For example, AlShishi (2006) explored eGovernment adoption in Oman from both demand and supply side perspectives. From the demand side perspective, the study found a correlation between eGovernment adoption and the participants' characteristics such as ICT literacy, age, education, and income. According to this study, citizens who are young, educated, and have a higher income are likely to adopt eGovernment services faster than others. In addition, eGovernment adopters are likely to be computer and Internet literate. This study also examined the main barriers to citizen adoption of eGovernment information and services. The lack of citizen ICT literacy, awareness and knowledge about eGovernment, and the lack of trust were the most significant. In Jordan, Ciborra and Navarra (2005) explored the main challenges facing eGovernment. Implementation in this country, according to them, Jordan is one of the rare countries in the Middle East with a history of commitment to good governance and ICT-related initiatives. At the time of their

study the implementation of eGovernment in Jordan was at an early, but crucial stage. The King was very committed to the success of ICT led projects, which signaled high-level commitment to eGovernment initiatives. The recently formed Ministry of Information and Communication Technology (MoICT) – previously the Ministry of Post and Communication – is the government body in charge of implementing eGovernment initiatives. The MoICT is in the delicate phase of coordinating a number of activities with all other government ministries and departments. The main objectives are the creation of a shared vision about eGovernment and a government wide network infrastructure to enable the government to introduce knowledge management, empower, and connect government staff.

3. Present status of eGovernment in Egypt

Egypt as one of the largest counties in the Arab World has many large cities such as Cairo, Alexandria, Behera, Dakahlia and Giza. Any large city requires a modern ICT infrastructure to support its electronic government environment. Today, that means a large installed base of fiber networks, mobile telecoms infrastructure, universal broadband access across PSTN or cable networks, and a ready supply of support businesses across the whole ICT sector that can set up and maintain all aspects of ICT provision. Without a good ICT infrastructure a city simply cannot compete in the modern world (Brady et al., 2002). People will avoid setting up their companies if ICT infrastructural and service provision is inadequate. The ICT community is also a significant part of the modern business population of any city as well as support for other sectors. Other areas such as good public transport, roads, refuse collection, energy and other public services must also be of high quality, and many of these will use ICT to improve their efficiency too.

“Public administration and governments are central to extending information society into the fields of democratic decision-making, accountability, community building, economic development and support for civil society”, stated the final report of the EU Government on-line strategic review board in 1997 (Ashby et al., 1997). In this direction the Egyptian government established the Ministry of Communication and Information Technology in October 1999 with the objective of fostering local competitiveness and converting Egypt into an information society. The three main routes of work are Government to Government, Government to Citizen and Government to Business. The objective is to provide government services to individual citizens and enterprises online through secure government networks, ‘one-stop shop’ portals and service delivery centers located in postal offices and IT clubs (Ministry of Communications and Information Technology, 2006).

The eGovernment project in Egypt had the following targets: a) improve citizen services, b) create an investors’ friendly environment, c) provide accurate and updated information to decision makers, d) reduce government expenditure, and e) foster local competitiveness in a global economy. Paying a visit to the eGovernment sites (www.alhokoma.org.eg, www.egypt.gov.eg, and www.edara.gov.eg) one can see that the government has launched some pilot projects for public service delivery on-line, such as the issuance of official copies of birth certificates, paying telephone bills on line, tracing lost and found items (in cooperation with the Egyptian post services) and others. This portal was developed in cooperation with local partners and was ready to be launched. A similar agreement was signed with Oracle Corporation, indicating that both Microsoft and Oracle would make the necessary information infrastructure available for governmental entities. This project had a whole frame by 2007 as part of the past Egyptian Government’s five-year development plan, while the executive development plan for the eGovernment project consists of five main axes that will be implemented simultaneously to make the national projects as efficient as possible.

The Egyptian government provides people with some electronic services; however, most of these services are unknown because of the lack of advertising and dissemination. Electronic government in Egypt offers services in many fields:

- Citizens’ services: providing services to the public in an accessible, relevant and timely format. Clear examples for such services are: Birth Certificate Request and National ID Replacement Request.
- Foreigners’ services: this kind of service is directed to the foreigners whose accommodation is in Egypt. This type of service has the clear objective of making life easier for foreigners in Egypt. Clear examples for such services are: work permits services, education services, accommodation services.

- Companies' services: the Ministry of Industry is assisting industrial organizations to modernize their IT infrastructure and provide online access to their websites. The ministry also developed a central information system for most companies in Egypt, where summary data about their activities and financial reports is stored and updated, and used e-learning technologies in vocational training. Clear examples for such services are: the ministry of industry developed a smart map system to improve decision making. The smart map includes information on industries, raw materials, airports, urban and agricultural areas, and infrastructure.
- Investors' services: helping investors to get the required information, plus facilitating the investing process by automating few processes to start an investment. Clear examples for such services are: the ministry of finance worked with the Ministry of Transportation and MCIT to automate the port of Damietta. This includes automating procedures related to customs, exports, imports, and containers processing. The Ministry of Finance has also automated the sales tax system and has created a unified tax and customs center to facilitate the process for investors.
- Exporters' services: the government has set a strategic priority to increase the country's exports. In order to do so, the government has asked relevant ministries to develop the necessary tools to reduce barriers to exports, including the lack of information on export opportunities and procedures. Clear examples for such services are: the portal is offering steps for exporting showing specialized information for shipping, transport packaging, and customs procedures.

The current study tries to explore and evaluate service quality and customer satisfaction in citizen services. These services include: job services, education services, immigration services, healthcare services, car licenses services, police services and other services.

4. The questionnaire

A questionnaire was designed to investigate the perception of Egyptian citizens of the eGovernment portal; this questionnaire used the Electronic Government Satisfaction Model (Horan and Abhichandani, 2006). The current model was used before in 2009, it includes various performance and emotional measures, capturing three constructs (utility, efficiency, and customization) as affecting four emotional dimensions (confidence, pleasantness, frustration and satisfaction). This model considers these varied perspectives and presents a causal construct comprised of features that promote confidence, trust, openness and citizen-centric delivery in utilizing online government initiatives. In addition, it considers the emotional response of the users to be a dependent factor on performance features of digital government service delivery.

Since using eGovernment applications is still a new behavior in Egypt, the intended population will be people who are using the eGovernment portal. This questionnaire measured the main emotional factors (confidence, pleasantness, frustration and satisfaction). The purposive sample for this questionnaire was at least 560 people, after excluding some participant's answers the final number was 480 respondents, taken from two sectors (students and employees). The questionnaire included an additional important factor, which is awareness; this factor was measured by the Technology Acceptance Model (TAM) (Horan and Abhichandani, 2006).

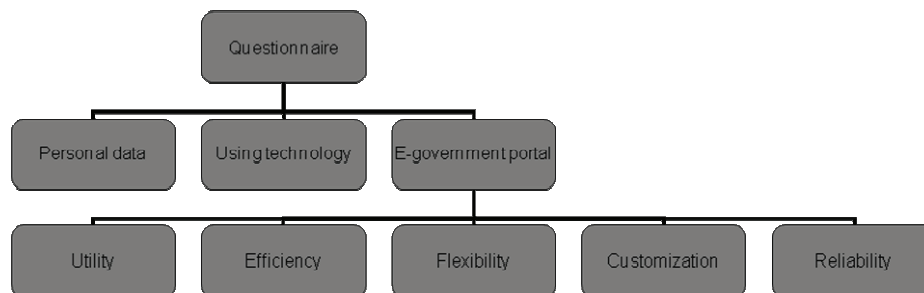


Figure 1: Study questionnaire components

5. Discussion of results

The outcomes demonstrate some of the Egyptian citizen's perception about their eGovernment portal.

5.1 Demographic statistics

The number of respondents was 560; however 80 replies were excluded since answers were improper. Of the excluders 45 were choosing the same answer all over the questionnaire which was "strongly agree". Other were excluded because of lack of answers, more than 80% of questions were not answered. Approximately 74% of respondents were between 19 and 34 years old and 14% were under 19; this shows that the greater part of respondents were young people. Egypt has a reasonably young population, but the current outcomes are higher representation than the general population of 46% aged between 15 and 35 years (Central Agency for Public Mobilization & Statistics, 2009).



Figure 2: Age distribution

In 2009 female participation was around 56%. As happened before, female as basic element in the society participated strongly in this study. It was recognizable that more than 68% of respondents were females, while it was predictable that men would be a higher percentage. In the Egyptian society, the labor force is mainly male and, in the household, the male is in charge for any communication involving home and other external environments. Men are expected to deal with public authorities for processes like obtaining a birth certificate or renewing a license. On the other hand, the questionnaire demonstrated that females are also involved in using public services. It might be that females find the needed information on the portal and then males will accomplish the process.

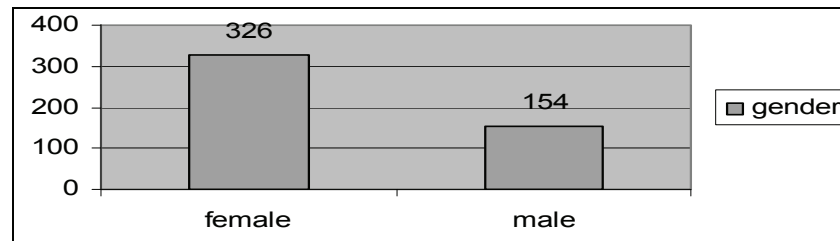


Figure 3: Gender distribution

Of the participants, 15% had a high school degree, 67% had a university degree, and 9% had a post graduate degree. Others were obtained elementary school degree and college degree.

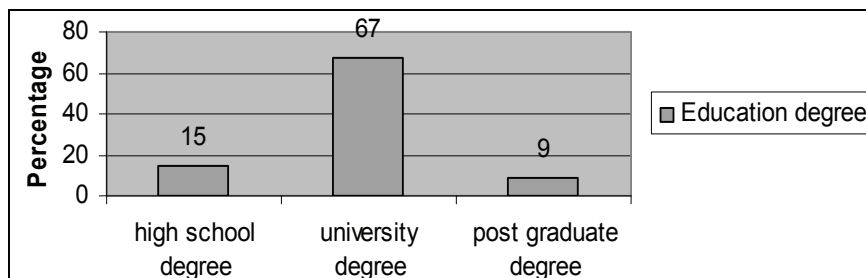


Figure 4: Education degree

5.2 Technology usage

More than 98% of the respondents own computers at home; 88% of these are using a computer daily at the same time 8% are using a computer once a week. This could be an outcome of education status. Moreover, a project in Egypt, sponsored by the past Ministry of Telecommunication and Information Technology in order to offer a PC for every home. The Ministry attempted to reach this objective by providing cheap PCs to Egyptian homes with payment by installments that is fitting most educated families living in Cairo.

Usage of the Internet was carried out every day by 95% of the participants; on the other hand more than 3% used the Internet at least once a week. More than 96% of respondents have an Internet service at home. The previous facts point at the Government's efforts to offer Internet facilities in society. This support included reducing the rate and, at present, a citizen can apply for Internet access at home from 45 Egyptian pounds a month.

91% of respondents were using the Internet for finding information. In many cases finding information on the Internet is easier than making phone calls or visiting a public authority, where it might take hours to obtain the information. Other uses of the Internet include: 25% for buying; 92% for entertainment; 55% for banking; 98% for contacting people; and 40% for finding a job. On the subject of submitting personal details such as credit card number over the Internet, 28% have done that, but 72% have not.

5.3 Citizens' opinion regarding their eGovernment portal

Questions in the following sections were all of the Likert scale type. Figure 1 shows the overall levels of satisfaction with the eGovernment portal.

Table 1: Citizen's opinion overview

Construct	Percentage of satisfaction
Utility	72%
Reliability	28%
Flexibility	25%
Customization	35%
Efficiency	71%

5.3.1 Utility

Majority of respondents have good impression regarding the eGovernment portal's utility, approximately 72% are satisfied, 5.3% are moderate and 22.7% are not satisfied with utility.

The questions and answers for this section were:

- Compared to current government services and facilities, did the new eGovernment portal appear to be offering required information more efficiently or not? About 63% believed that the Egyptian portal is offering required information efficiently; on the other hand more than 13% stated that the eGovernment portal is not offering required information.
- Learning how to use the eGovernment portal for you were considered as extremely easy or extremely difficult? Big part is satisfied with learning, 68% think that it so easy to learn how to use eGovernment portal; on the other hand 7.4% believe it is hard to learn.
- Compared to existing government services and facilities, does the new eGovernment portal appear to be more helpful to accomplish the required tasks or less helpful? Of the respondents 70% consider the portal is helpful to achieve the required mission, whereas 10% believe that portal does not help them.
- Did the eGovernment portal provide valuable information through every step when surfing the portal? Of the respondents 32% agreed that eGovernment portal provides important information through every step when surfing the portal, while 45% disagreed.
- Are the procedures and transactions on the eGovernment portal easily registered or not? Of the respondents 71.3% felt it was easy to register in the portal and around 8.6% found it was difficult to register.

- Were procedures and transactions on the eGovernment portal user friendly or difficult to understand? Of the respondents 62% believed that the portal is user friendly, whereas 17% described it as a hard job to deal with the portal.

5.3.2 Reliability

The questions for this construct were:

- Heavily depends on eGovernment portal or rarely depends on eGovernment portal? Only 22.8% can depend on eGovernment portal, 68.6% see it is difficult to depend on it during achieving tasks.
- Each time you need information you found it available on the eGovernment portal? More than 12.4% think portal always provides them by the needed information; on the other hand 58% disagree with this point of view.
- Whether information provided through eGovernment portal is believed to be answering my questions or does not offer very specific answers to my questions? Of the respondents 32% are convenient that portal is answering their questions, 33.6% believe portal does not offer specific answers.
- Compared to existing government services and facilities, does the new eGovernment portal appear to be matching with real life procedures and fees? Majority of respondents were satisfied with information on the portal, 21.8% agree that information on the portal is matching with real procedures and fees, 12.7% believe that it is far from the real procedures and fees.
- Compared to existing government services and facilities, does the new eGovernment portal appear to be accurate or not accurate? Small part of respondents was happy with contents accuracy; only 43% believe portal is accurate in its content; however 6% believe it was infrequently accurate.

5.3.3 Flexibility

Just 25% are considering eGovernment portal as a flexible tool, on the other hand more than 62% believe it is not flexible.

The questions for this construct were:

- While using the eGovernment portal, did you find the provided services available 24 hours a day? Of the respondents 71% consider information is not available 24 hours a day, 23% agree that information is available 24 hours a day.
- Was there any facility allowed you to receive required information in many formats (e.g. figures, word documents or PDF formats)? Of the respondents 28.3% agree there is a facility allowing them to receive required information in many formats (e.g. figures, word documents or PDF formats). On the other hand 47.1% disagree
- Did you find real time information (e.g. exchange prices or airport schedule) conveyed the latest updates? More than 32.6% believe real time information (e.g. exchange prices or airport schedule) convey the latest updates, but 25.5% disagree.
- Was the eGovernment portal enabling to request multiple services at a time or limited requests per once provided? More than 22.3% feel portal always enabling them to request multiple services at a time, on the other hand 37% agree that it is offering just limited requests per once.
- Could change personal data or not? 25% agree it is easy to change personal data, while 45% see it is very difficult to change such type of data.
- Were payment methods limited or it offered a variety of payment methods? Only 52.6% believed that payments methods were limited, 10% believed that there were a variety of payment methods.

5.3.4 Customization

Of the respondents 35% of respondents are satisfied with portal regarding its customization capabilities; on the other hand 48% are not pleased.

The questions for this construct were:

- Save your record to future reference or does not save your records? More than 65% assume portal is always saves records to a future reference; more than 25% believe it is rarely happening.
- Does it offer variety of reply or notification methods or no flexibility to choose reply or notification method? More than 22% judge that portal has various ways of reply or notification methods, 39% refuse. They believe there was no flexibility to choose reply or notification method.
- Determine the day to deliver required information or can not identity the day to deliver required information? Only 24% think they are able to determine the day to deliver required information, while 40% can not choose the day to deliver the information.
- Could find your previous record easily or was it difficult to find your previous records? Almost half of respondents believe they can find their previous record easily (48%), while 30% discover it is hard to find their previous records.
- While logging in, did you find some news which was related to your interests? While logging in the portal, only 11% find some news which is related to their interests; on the other hand 61% disagree with that.
- Were you able to request information the way you wanted to. (e.g. on mobile devices or e-mail format.)? More than 43% agree they are able to request information the way they want. (e.g. on mobile devices or e-mail format.). 27% disagree; they find just one way to request the needed information.

5.3.5 Efficiency

Bulk of respondents is pleased with the portal efficiency (71%), while 26% are not satisfied.

The questions for this construct were:

- Did you find the (layout) or organization of data in the eGovernment portal appeared to be accurate or not? Concerning the portal's lay out accuracy, 69% believe that layout is accurate; on the other hand 14% find it not accurate.
- Did you find the (layout) or organization of data in the eGovernment portal appeared to be organized appropriately or not organized at all? Of the respondents 57% think eGovernment portal is organized appropriately, 15% believe it is not arranged.
- Did you find the (layout) or organization of data in the eGovernment portal appeared to be visually pleasing or poor visual included? Only 25% believe portal is visually pleasing while 64% believe portal is including poor visual capabilities.
- Were required steps to accomplish the tasks logically sorted? More than 86% agree that required steps to accomplish the tasks are logically sorted. 11% disagree.
- Was the required service speedy accessible? Few respondents were happy with the speed, 18% consider the required service is speedy accessible, on the other hand more than 54% believe it was slowly accessible.
- Did eGovernment portal need more functions or integrating many functions? Of the respondents 67% consider eGovernment portal is integrating many functions, 31% believe portal needs more functions.
- Did eGovernment portal help you in finding all the wanted services? Only 29.8% agree eGovernment portal helps them in finding all the wanted services. 32% disagree with this point of view.

6. Conclusion

Egypt's eGovernment program is at the beginning and these kinds of initiatives take a long time to penetrate society, especially in the case of a developing country. The questionnaire sample demonstrated that while around 3% of respondents had an elementary school grade certificate, the rest of the sample had a high school degree, college degree or higher degree. This should be considered a biased sample because this is not the case in Egypt. The country has illiteracy problem, which affects more than 40% of the population. For the purpose of this study, the focus was on educated respondents to ensure the usage of ICT facilities, especially the eGovernment portal, and to collect appropriate data.

The questionnaire provided a small picture of what is going on with eGovernment services in Egypt and reflected the citizens' perception regarding their eGovernment portal. These results showed both good and poor impressions regarding the portal. Therefore, more studies should be done to discover more about the Egyptian perception regarding the eGovernment portal.

References

- Abusin, M. (2007), "Government of Sudan eGovernment Initiatives: Challenges and Opportunities", Proceedings of the 7th European Conference on eGovernment, Haagse Hogeschool, Den Haag, the Netherlands, 21-22 June, pp 9-14.
- Almahandi, A. (2004), "EGovernment program: The experience of Qatar", last accessed on 4 October 2007 at: <http://unpan1.un.org/intradoc/groups/public/documentsd/UNESCWA/UNPAN015332.pdf>.
- AlShishi, H. (2006), "Critical Factors in the Adoption and Diffusion of EGovernment Initiatives in Oman", PhD thesis, Victoria University, Australia.
- Al-Shehry, A., Rogerson, S., Fairweather, N. and Prior, M. (2006), "The Motivations for Change towards EGovernment Adoption: Saudi Arabia as a Case Study", last accessed on 4 April 2007 at: <http://www.iseing.org/egov/eGOV06/Accepted%20Papers/604/CRC/eGOV06-604%CRC.pdf>.
- Ashby, C., Cornford, J., Cruyssen, P., Drew, C. and Ostberg, O. (1997), "The 5th FP Government on-line Strategic Review Board", EU commission Document.
- Brady, M., Saren, M. and Tzokas, N. (2002), "Integrating Information Technology into Marketing Practice – The IT Reality of Contemporary Marketing Practice". *Journal of Marketing Management*, Vol. 18, pp 555-577.
- Central Agency for Public Mobilization & Statistics (2009), "Year Book".
- Chatfield, A. & Alhujran, O. (2007), "EGovernment Service Delivery Capabilities: An Analysis of the Arab Countries in Africa and the Middle East", *Proceeding of the DCCA 2007 International Conference on Digital Communications and Computer Applications*, Amman, Jordan, 19-22 March, pp 615-624.
- Ciborra, C. and Navarra, D. (2005), "Good Governance, Development Theory and Aid Policy: Risks and Challenges of EGovernment in Jordan", *Information Technology for Development*, vol. 11, no. 2, pp 141-159.
- Horan, T. and Abhichandani, T. (2006), "Evaluating user satisfaction in an eGovernment initiative: results of structural equation modeling and focus group discussions", *Journal of Information Technology Management*, Vol. 17, No. 4, pp 33-44.
- Kearney, A. (2010), "The Global Cities Index 2010", last accessed on 25 December 2011 at: <http://www.foreignpolicy.com/node/373401>
- Kostopoulos, G. (2004), "EGovernment in the Arabian Gulf: A Vision toward Reality", *Electronic Government, an International Journal*, vol.1, no. 3, pp 293-299.
- Ministry of Communications and Information Technology (MCIT) portal for the Communications and Information Technology Industry (2006), *Local CIT Industry Indicators*. [online]. Last accessed on 4 March 2006 at: www.citegypt.com/indicators.asp.
- Pons, A. (2004), "EGovernment for the Arab Countries", *Journal of Global Information Technology Management*, vol.7, no.1, pp 30-46.
- Sahraoui, S. (2005), "EGovernment in the Arabian Gulf: Government Transformation vs. Government Automation, last accessed on 10 November 2006 at: <http://www.iseing.org/egov/eGOV05/Source%20Files/Papers/CameraReady-16-P.pdf>.
- UNPAN (2005), "From eGovernment to E-inclusion", *UN Global eGovernment Readiness Report 2005*, Department of Economic and Social Affairs, Division for Public Administration and Development Management, The United Nations.
- UNPAN (2008), "From eGovernment to Connected Governance", *UN eGovernment survey 2008*, Department of Economic and Social Affairs, Division for Public Administration and Development Management, The United Nations.
- World Bank (2007), *Ease of Doing Business Report*. Washington DC: The World Bank.
- World Bank (2011), *Ease of Doing Business Report*. Washington DC: The World Bank.
- Zaied, A., Khairalla, F. and Al-Rashed, W., (2007), "Assessing e-Readiness in the Arab Countries: Perception towards ICT Environment in Public Organizations in the State of Kuwait", *Electronic Journal of eGovernment*, vol. 5, no. 1, pp 77-86.

RegulationRoom: Field-Testing an Online Public Participation Platform During USA Agency Rulemakings

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Abstract: Rulemaking is one of the U.S. government's most important policymaking methods. Although broad transparency and participation rights are part of its legal structure, significant barriers prevent effective engagement by many groups of interested citizens. RegulationRoom, an experimental open-government partnership between academic researchers and government agencies, is a socio-technical participation system that uses multiple methods to alert and effectively engage new voices in rulemaking. Initial results give cause for optimism but also caution that successful use of new technologies to increase participation in complex government policy decisions is more difficult and resource-intensive than many proponents expect.

Keywords: e-rulemaking, online participation, public participation, eGovernment, open government

1. Introduction

On his first day in office, USA President Barack Obama issued an Open Government Memorandum to the heads of federal agencies. It directed them to use Web 2.0 and other information and communications technologies (ICTs) to increase transparency, public participation and collaboration in their decisionmaking. By the end of Obama's first year in office, the White House had held a national, online Open Government Initiative involving more than 20,000 unique visitors that comprised brainstorming, discussion, and collaborative drafting phases. It had also issued an Open Government Directive that told agencies to make government datasets available online and to expand the provision of government e-services. The Directive also emphasized using Web 2.0 ICTs to expand public involvement in federal decision making. Agencies were given four months to create "open government plans," and six months to identify at least one open government "flagship initiative" project.

Here we present early experience from RegulationRoom, (<http://regulationroom.org/>), an experimental online public participation platform, which is the U.S. Department of Transportation's (USDOT) flagship initiative project. To date, the most prominent Obama Administration Web 2.0 participation projects have used ICTs such as Ideascale, Facebook, Twitter, and YouTube to engage citizens in brainstorming and posing questions to government officials. The RegulationRoom project is unusual in being a systematic effort to discover how to use ICTs to alert and engage citizens effectively in the formation of complex government policy. We focus on rulemaking, the process federal agencies use to make new health, safety, environmental, and other regulations.

Rulemaking has seemed an obvious target for eGovernment efforts for two reasons. First, it has become one of the most important methods for making public policy in the U.S. (Kerwin 2003) Second, transparency and participation rights are already part of its formal legal structure. (Strauss et al, 2011) The originating agency for a rulemaking is required to give public notice of what it is proposing, to reveal the scientific studies or other data it is using, and to explain its legal and policy rationales. Then, it must provide a period of time (typically 60–90 days) during which any person has the right to comment on any part of the proposal. The agency then must read all comments and consider them. To confirm that it has done so, it must publish a written explanation that responds to criticisms, questions, and suggestions made in the comments. (Lubbers 2006) Although the right to comment is universal, the process has been dominated by large corporations, trade and professional associations, and similar legally sophisticated and well-resourced entities. (Kerwin 2003)

Since the mid-1990s, individual agencies like USDOT and the federal government as a whole have tried to broaden rulemaking participation by using the Internet. These first generation "e-rulemaking" systems essentially put the conventional process online: citizens are able to go a website, view the

“Notice of Proposed Rulemaking” and other key rulemaking documents, and submit a comment either by typing into a comment box or by attaching a document file. Unfortunately, researchers agree that first generation e-rulemaking systems have not produced significantly broader, meaningful public participation. (Report 2008; Balla and Daniels 2007; Coglianese 2006)

RegulationRoom is a second-generation e-rulemaking system that uses Web 2.0 ICTs and human facilitative moderation to support effective rulemaking participation. The project is a unique collaboration between academic researchers of the Cornell eRulemaking Initiative (CeRI) and the government. CeRI owns, designs, operates, and controls RegulationRoom, but also works closely with USDOT to identify suitable “live” rulemakings for the site. (Farina, et al., 2011a) Agency officials work with CeRI before the public comment period opens, and help evaluate success after it closes. This collaboration allows us to field test design and operational strategies for eliciting and supporting participation by individuals who have not previously commented in a federal rulemaking. CeRI involves researchers from communications, computing, conflict resolution, information science, law, legal informatics, and political science. This type of interdisciplinary approach has been recognized as important to designing successful online participation systems. (Preece 2000; Report 2008)

After outlining the goals and main features of RegulationRoom, this paper briefly describes experience with the first three rulemakings offered on the site.

2. RegulationRoom: Using multiple methods to lower participation barriers

After examining the unsuccessful history of conventional rulemaking and first-generation e-rulemaking systems, we hypothesized that a public participation system must address three barriers to citizen engagement.

- **Unawareness:** Many regulations have direct impact on individuals, small businesses, local and state government entities, and non-governmental organizations. Unfortunately, Notices of Proposed Rulemakings (NPRMs) rarely reach these kinds of stakeholders. The Federal Register (the official location for such agency announcements) is available online at federalregister.gov, but most individuals and groups do not know that it exists. Increasingly, important rulemakings are noted on industry, news, and political blogs, but rarely do these sources either explain that everyone has a legal right to submit comments or link to the official government commenting portal, regulations.gov.
- **Information Overload:** By law, agencies must justify their proposals on legal, scientific, economic, and policy grounds. Therefore, rulemaking is extraordinarily information-intensive. The documents are long and complex. For example, the NPRMs of rules offered on RegulationRoom contain 13,000–27,000 words and are written at a graduate-school reading level. In addition, NPRMs are accompanied by one or more lengthy reports that assess the nature and extent of predicted social benefits and costs. Such materials place enormous attentional and cognitive demands on would-be participants. Yet, as explained next, they *must* understand at least some part of this information in order to comment effectively.
- **Process Ignorance:** Despite rulemaking’s importance, few U.S. citizens – even those well educated and politically attuned – know about it or understand how it works. Because agencies work under rigorous legal requirements of data collection and review, deliberative consideration of criticisms and alternatives, and assessment of costs and benefits, rulemaking is a process of “technocratic rationality.” (Farina et al. 2011b) For most U.S. citizens, however, participation in government decisionmaking means casting a vote – formally in elections and referenda, or informally in opinion polls and surveys. Thus, when inexperienced participants *do* comment they do not make the sort of informed, reasoned statements that have weight in the agency’s decision. Rather, they treat rulemaking as a plebiscite, sometimes making hundreds of thousands of “comments” that are virtually worthless expressions of general support or opposition. (Shulman 2006)

To address these barriers, RegulationRoom uses a combination of social and conventional media, purposeful site design, design of informational content, and human facilitative moderation.

2.1 Remediating unawareness

USDOT conducts several hundred rulemakings annually, most of which affect only limited industry groups who already participate effectively. Rulemakings done on RegulationRoom are carefully selected because they directly affect individuals or groups unlikely to meaningfully engage in the

conventional process. Of the three rulemakings discussed here, two involved commercial motor vehicle operators (CMVOs); about 99% of these companies are small businesses. The “texting rule” proposed to ban texting while driving for CMVOs (USDOT 2010a); the “EOBR rule” proposed to require CMVOs to purchase and use “electronic onboard recorders” to verify compliance with maximum driving time limits. (USDOT 2011a) A third rulemaking, the “APR rule,” proposed new airline passenger rights in areas including tarmac delay, flight delays and rebooking, fare advertisement, and baggage fees. (USDOT 2010b) (As this paper was written, we were concluding a fourth rulemaking that would require that air travel websites and airport check-in kiosks be accessible to travelers with disabilities (USDOT 2011b))

Once a rule is chosen, the process of remediating public unawareness begins long before the comment period opens. First, we create a communications outreach plan: After defining the kinds of stakeholders we want to alert, we try to discover where, and how, these target groups get information. We identify membership associations, recreational and trade publications, and influential individuals such as bloggers, and reach out to them through email, phone, and online communications. We develop a list of keywords and phrases to use (1) *proactively* in daily tweeting and Facebook posting and, most recently, in Facebook and Google ads; and (2) *reactively* by setting up continuous automated searches and responding with comments or tweets when the rule or its subjects appears in news sites, blogs or Twitter. RegulationRoom has a presence on Facebook, and the site itself is designed to encourage users to “share” both issue posts and individual comments. We coordinate media outreach with USDOT’s communications office, and try to persuade conventional and online media to publicize the rulemaking and the availability of RegulationRoom. We have found that print coverage can be surprisingly effective in driving online participation. (Farina et al. 2011b)

Registered users receive a welcome email, as well as a notice whenever someone replies to their comments. We email them periodically *during* the comment period to provide updates and encourage further participation, and *after* the comment period closes to report on how the rulemaking concluded – an important step often omitted in public participation projects. (Johnson 2009) In sum, the outreach challenge is winning what Lupia calls “the Battle for Attention.” (Lupia 2002) The communications objective is not simply alerting the targeted groups to the rulemaking, but also motivating them (1) to focus on this (rather than all the other stimuli in their environment); and (2) to take action to participate (rather than doing all the other personal and professional tasks they might be doing). In general, the most effective strategy is to explain how adopting/rejecting the proposed rule will significantly benefit/harm them. (Lupia and McCubbins 1998)

2.2 Managing information overload

The other, equally challenging, “cognitive victory” required for effective participation (Lupia 2002) is presenting the vast information of a rulemaking so that people without legal or technical sophistication can use it. As Lupia observes: “the key is not simply putting people in a place where others speak. It is putting them in situations where they want to pay attention to information that will help them acquire the kinds of competence that motivated the deliberative enterprise in the first place.” (Lupia 2009) We wanted to offer “targeted” commenting – the ability for users to attach comments to specific segments of the proposal. E-rulemaking proponents long advocated such functionality to encourage more focused and specific comments, rather than the vague, global expressions of support or opposition often submitted by newcomers. We also recognized the crowdsourcing potential of targeted commenting: users themselves would organize comments by content. We found this functionality in Digress.It, available as a plug-in for the WordPress content management and blog publishing application on which RegulationRoom is built.

However, because of both length and readability level, having users comment directly on the NPRM text was infeasible. Our solution utilizes several information design strategies:

- Triage: identifying and fore-grounding the information users will most likely be interested in and need, and packaging this information in thematic segments (6–10 “issue posts”) of manageable length;
- Translation: using relatively simple vocabulary and sentence structure;
- “Layering:” heavily using hyperlinks to allow users, at their choice, to go deeper (e.g., to relevant sections of primary documents; to statutory text or background information) or to find help (e.g., glossary and brief explanation tooltips). Through layering, *all* information in the NPRM and

supporting documents is available on the site, but in a form that gives users control and is less likely to overwhelm; and

- Indexing: all the issue post topics are visible and accessible from a navigational index; *within* each post, every commentable section has a title, all of which are visible and accessible from an index at the top of the post. (The latter was a simple but effective solution to the problem we observed in early rules that users tended to attach comments to the first section, regardless of content.)

The other essential component of managing information overload for inexperienced commenters is human facilitative moderation. The moderator interventions (described next) include: (1) recognizing when users are missing, or misunderstanding, important information and helping them acquire it; (2) encouraging more knowledgeable or engaged users to go more deeply into the agency's analysis; and (3) pointing out other issues, and other comments, that are related to the commenter's apparent interests or concerns. Although we continue to refine our information design strategies with every rule, we doubt it is possible for inexperienced commenters to manage the information demands of effective participation without assistance. In some settings, other commenters provide this (Cosley et al. 2005), and this peer-assistance can contribute to online community-building (Farzan et al. 2009). Our experience suggests, however, that peer mentoring is less likely to occur when most users are relatively unknowledgeable, and when participation is perceived as episodic (rule-specific) rather than as engagement with an ongoing community.

2.3 Remediating ignorance of the process

Educational materials on the site include "Learn More" pages that use graphics and simple language to explain the rulemaking process and effective commenting. Users can also watch a short video explaining rulemaking. However, consistent with general website use patterns, these educational aids are used only sporadically. (Farina et al. 2011b) The principal strategy for increasing rulemaking "participation literacy" is tacit rather than overt: human moderators who mentor effective commenting using facilitative moderation. Law students in an eGovernment clinic are trained in the conflict resolution techniques of content- and process-based group facilitation (Kaner 2007), and they moderate asynchronously under the supervision of senior researchers. A detailed Moderator Protocol identifies eight different roles, with a total of twenty-one types of interventions a moderator might make. (See Table 1) Along with roles that advance general online-community building (e.g., Social functions; Stimulate discussion), moderators help users manage the large informational load of rulemaking (e.g., Substance education) and covertly educate them in what effective participation requires (e.g., Mentor effective commenting; Stimulate discussion).

Table 1: Moderator protocol

Moderator Roles:	Interventions:
Social functions	Welcoming Encouragement; appreciation of comment Thanks for participating
Site use issues	Resolving technical difficulties Information about goals/rules of moderation Information about who we (CeRI) are
Policing	Redact/quarantine Civility policing
Wrong venue	Directing commenter outside the site
Stimulate discussion	Encourage users to consider and engage comments of others Posing question to the community that encourages other commenters to respond
Substance education	Providing substantive information about proposed rule Correcting misstatements or clarifying what agency is looking for Pointing commenter to relevant information in primary documents or other data sources
Mentoring effective commenting	Pointing out characteristics of effective commenting Asking for more information, factual details or data Asking commenter to consider possible solutions/alternative approaches Getting off-topic commenter to engage the issues Asking for elaboration Asking for clarification
Organizing discussion	Directing user to another post within the rule

Facilitative moderation differs radically from the “policing” moderation common on US public participation websites. On RegulationRoom, moderators are frequent, visible voices in the discussion. At the same time, we emphasize a unified, objective “moderator persona.” Moderators are advocates for and keepers of the *process*. Their job is to facilitate a “knowledge building community” that supports learning about, participation in, and access to the rulemaking process. They model (and, in the very few cases it has proved necessary, remind users of) the kind of thoughtful, inclusive engagement that we try to cultivate as the site norm. Most important, they strive not only to be neutral but also to be *perceived by users* as being neutral about the wisdom of the proposal.

Research goals of moderation include not only assessing the success of traditional “face-to-face” facilitation techniques in the online environment, but also experimenting with natural language processing approaches to identify comments requiring intervention. (Cardie et al. 2012) Initially, automation would assist human moderation; eventually, it may allow creation of synchronous, automated comment support interfaces.

Site design and functionality supports moderator efforts. Giving users the ability to rate or recommend a comment is a proven inducement to engagement in an online community. (Farzan et al. 2009) Nonetheless, we made the deliberate choice not to encourage “rulemaking as plebiscite” by including any sort of user voting or ranking mechanism. *Moderators* can “recommend” comments that illustrate effective commenting, and this designation both reinforces desired site norms and teaches effective participation. Recently, we added an “Endorse” function (i.e. “Endorse comments that do a good job making of a good point”), based on post-rule survey evidence that some users did not comment because others had already made the point they would have made. We added “Endorse” to give such community-minded “lurkers” a method of participating if they wish. (Nonnecke and Preece 2001) So far, about 25% of endorsements are made by users who do not otherwise comment, suggesting that the functionality is fulfilling an important role for some participants.

3. Results and observations on the first three rulemakings

Table 2 presents participation data from the first three RegulationRoom rulemakings.

Table 2: Participation data

Rule	Length of comment period (days)	Unique visitors	Visitors who registered	Number of comments	Number of users who commented
Texting	34	3665	54	32	18
APR	110	19320	1189	931	348
EOBR	106	5328	121	235	68

3.1 Data about interests and rulemaking experience

At registration, participants were asked about their “interest” in the rule (see Tables 3-5). Answering this question was optional; response rates were 37% (Texting); 52% (APR); and 85% (EOBR). More than one interest could be selected, although for the most generic category (first in each table), the reported number of users is those who selected *only* that interest. Participants were also asked about their federal rulemaking experience; response rates were 100% in Texting and EOBR and 92% in APR.

Table 3: Texting rule

Declared Interest	n
Member of the driving public	6
Trucking industry owner/operator	6
Working for state or local government	2
Member of advocacy group	2
Researcher/ expert	1
Other	3
Total	20

98% of Texting Rule registered users reported either no previous rulemaking experience or not being sure whether they had any.

Table 4: APR Rule registered users

Declared Interest	n
Air Traveler	566
Work for US Carrier	7
Work for travel agent/global distribution system	4
Researcher/expert	7
Advocacy group	1
Other	36
Total	621

94.5% of APR rule respondents reported either no previous rulemaking experience or not being sure whether they had any.

Table 5: EOBR rule registered users

Declared Interest	n
Member of the public	9
CMV Drivers	54
CMV Owner/Manager	61
Law Enforcement	2
Advocacy group	3
Researcher	1
Other	4
Total	134

73.6% of EOBR Rule registered users reported either no previous rulemaking experience or not being sure whether they had any.

3.2 Observations

3.2.1 *Losing the battle for public attention*

USDOT expected the Texting Rule to be widely controversial, among both safe driving groups and the 800,000-plus CMVOs who would be at risk of losing their operating license. However, as Table 2 shows, the amount of activity was modest, at best. What happened?

We first noted this rule's atypically short comment period of 34 days; both the APR and EOBR Rules had > 100 day comment periods. We concluded, though, that this was not the principal problem. About six weeks before the rule opened, the Secretary of Transportation held a major news conference announcing that USDOT had just banned texting by CMVOs. In fact, USDOT was "interpreting" existing trucking safety regulations to cover texting; this was supposed to be a stopgap, distracted-driving response until an actual no-texting rule could be completed. Not surprisingly, this distinction between a stopgap "interpretation" and a detailed legally-binding rule was lost on journalists and the public alike. Our search found more than 1500 online news stories and blogs and 400 online comments around the time of the Secretary's announcement. When the actual Texting Rule opened for comment, however, it prompted less than one-third as many stories and one-tenth as many online comments.

Neither our traditional media nor social media outreach efforts could win the battle for attention once the news cycle had run and public interest had faded. The practical lesson was that well-strategized, concerted communications with the agency are essential to alerting and engaging new voices in rulemaking

3.2.2 The emergence of “power users”

Widely varying degrees of participation are a well-known pattern in online communities. (Preece et al. 2004) This pattern of participation inequality is variously called the “90-9-1” rule, the power-law rule, or Zipf’s law (Nielsen 2006): a very small number of commenters make a high number of comments while most users make one or two comments. Although RegulationRoom uses multiple methods to support all users in participating, Figure 1 clearly shows the long-tail distribution pattern:

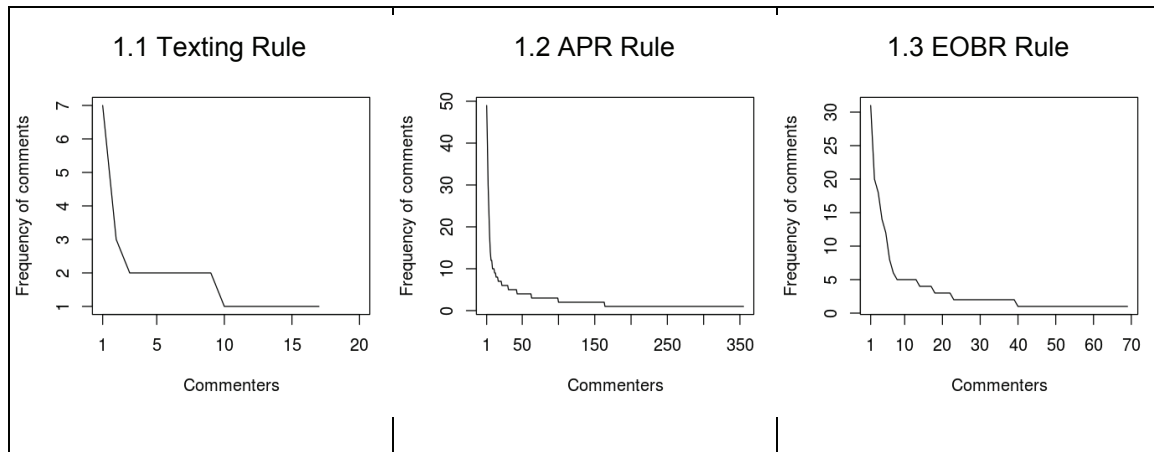


Figure 1: Relationship between unique commenter and number of comments

3.2.3 Benefits and costs of “single-issue” participants

The APR Rule demonstrated how a focused group of stakeholders – in this case, peanut allergy sufferers – can leverage social media to disseminate a political call to action. (Aaker et al. 2010) USDOT invited reaction to the possibility of restricting peanuts on airplanes to protect travelers with severe allergies. No specific proposal was made; the agency merely “floated” the idea. The result was completely unexpected. In the first week, the Peanut Allergy post got > 300 percent more traffic than any other, with 44 percent of traffic coming from Facebook. By the end of the comment period, the post had > 3.5 times as many visits as the next most popular, and > 4 times as many users made comments on this post as on the next highest. In total, comments on the Peanut Allergy post equaled those on all other posts combined.

Qualitatively, discussion on this post was the most lively and productive. In three rulemakings, it was the only time moderators needed to remind participants about expectations of civil discourse. Discussion between users was extremely useful, producing dozens of citations to scientific papers. However, the participation of peanut allergy commenters was as narrow as it was intense. Although these commenters were as likely as other commenters to make more than one comment, only 44.3% of them commented on other issues, compared to 67.6% of non-peanut allergy commenters.

3.3 More participation with value?

It is hard to identify clear measures by which to gauge the success of RegulationRoom efforts to alert and engage new participants in rulemaking. The process is completely unfamiliar to most people and making effective comments can be quite demanding. The very large proportion of registered users who report never having participated before in a federal rulemaking (or not knowing whether they participated – which seems to us functionally equivalent) is very encouraging. Our multi-method outreach and support strategies do seem to bring new voices into the rulemaking process, even if not in the numbers we had hoped.

Are RegulationRoom commenters making “better” comments than comparable, inexperienced commenters in the conventional process? We are attempting to develop a coding scheme for comment “quality” to provide a quantitative measure, although this is proving surprisingly difficult. Anecdotally, rulewriters in all three rules – including individuals who were skeptical about the benefits of the project – have praised the usefulness of RegulationRoom comments. In at least one rule, they provided several examples of new relevant knowledge not found in comments from the conventional process. We believe that the kind of on-the-ground, “situated” knowledge possessed by individuals

and small entities directly affected by regulation is likely to be the principal substantive value added by successful efforts at online public participation.

We also observe that moderation seems to matter. Between 60% and 70% of moderator interventions designed to elicit further information or discussion (vs., e.g., interventions designed to resolve site use questions) generate responsive comments from either the targeted user or another commenter.

What about from the perspective of users? RegulationRoom suffers from the pervasive difficulty of getting users to respond to site experience surveys. Our efforts to date have not generated large enough samples to be significant, but aggregated responses from three rulemakings show that users report that their RegulationRoom experience gave them a better understanding of: (1) the rulemaking process (50% yes; 30% no; 20% already knew about process); (2) what the agency is trying to do (74% yes; 15% no 11% aren't sure); and (3) the arguments of other commenters (83% yes; 10% no; 7% not sure). This kind of civic engagement value seems a relevant measure of success, and our future efforts will focus on better ways to collect such data from users.

4. Conclusion

Initial experience offering selected “live” agency rulemakings on RegulationRoom gives cause for optimism about using ICTs to broaden public participation in the domain of complex government policymaking. The overwhelming percentage of those who comment are new to the rulemaking process, and at least anecdotal evidence from agencies is that this new participation has value.

At the same time, the RegulationRoom experience cautions that the challenges are considerable and may not be fully appreciated by government leaders. Motivating individuals to participate in an unfamiliar process – one that requires considerable investment in time and attention – has proven far more difficult than even we anticipated. Making complex government policy issues accessible to laypersons requires carefully designed technical and human support. In particular, moderation matters, both in helping commenters obtain needed information and in nudging them to make effective comments. Natural language processing techniques almost certainly can make moderation less effortful, but it is not realistic to expect technology to replicate the value added by human moderators anytime soon. RegulationRoom’s most important lesson, we believe, is that broadening effective public participation requires considerable investment – not only from the citizen participants but also from their government.

References

- Aaker, J., Smith, A., and Adler, C. (2010) *The Dragonfly effect: Quick, Effective, and Powerful Ways to Use Social Media to Drive Social Change*, Wiley, San Francisco.
- Balla, S.J. and Daniels, B.M. (2007) “Information Technology and Public Commenting on Agency Regulations”, *Regulation & Governance*, Vol. 1 No.1, pp 46–67.
- Cardie, C. et al. (2012) “Facilitative Moderation for Online Participation in eRulemaking”, Digital Government Conference, College Park Maryland, USA, June.
- Coglianese, C. (2005) “Citizen Participation in Rulemaking: Past, Present, and Future”, *Duke Law Journal*, Vol. 55, pp 943.
- Cosley, D. et al. (2005) “How oversight improves member-maintained communities”, In *Proceedings of the SIGCHI Conference on Human factors in Computing Systems*, New York, NY, USA, pp 11–20.
- Farina, C. et al. (2011a) “Rulemaking 2.0”, *Miami Law Review*, Vol. 65 No. 2, pp 395–448.
- Farina, C. et al. (2011b) “Rulemaking in 140 Characters or Less: Social Networking and Public Participation in Rulemaking”, *Pace Law Review*, Vol. 31 No. 1, pp 382–463.
- Report to Congress and the President (2008) *Achieving the Potential: The Future of Federal E-Rulemaking*.
- Farzan, R., DiMicco, J.M., and Brownholtz, B. (2009) “Spreading the honey: a system for maintaining an online community”, In *Proceedings of the ACM 2009 International Conference on Supporting Group Work*, New York, NY, USA, pp 31–40.
- Johnston, P. (2009) “Open Government: Assessing the Obama Administration’s Efforts to Make Government Transparency a Reality”, [online], http://www.cisco.com/web/about/ac79/docs/pov/Open_and_Transparent_Government_Formatted_120209FINAL.pdf.
- Kaner, S. (2007) *Facilitator’s Guide to Participatory Decision-Making*, 2nd ed., Jossey-Bass.
- Kerwin, C.M. (2003) *Rulemaking: How Government Agencies Write Law and Make Policy*, 3rd ed., CQ Press, Washington, DC.
- Lubbers, J. (2006) *A Guide to Federal Agency Rulemaking*, 4th ed., American Bar Association, Chicago.
- Lupia, A. and McCubbins, M.D. (1998) *The democratic dilemma: Can citizens learn what they need to know?*, Cambridge Univ Press, Cambridge, UK.

- Lupia, A. (2002) "Deliberation disconnected: What it takes to improve civic competence", *Law and Contemporary Problems*, Vol. 65 No. 3, pp 133–150.
- Lupia, A. (2009) *Can Online Deliberation Improve Politics? Scientific Foundations for Success*, In *Online Deliberation: Design, Research, and Practice*, CSLI, Stanford, CA.
- Nielsen, J. (2006) "Participation Inequality: Encouraging More Users to Contribute", [online], http://www.useit.com/alertbox/participation_inequality.html.
- Nonnecke, B. and Preece, J. (2001) "Why lurkers lurk", In *Proceedings of the Americas Conference on Information Systems*, Boston.
- Preece, J. (2000) *Online communities: Designing Usability, Supporting Sociability*, Wiley, Chichester, UK.
- Preece, J., Nonnecke, B. and Andrews, D. (2004) "The Top Five Reasons for Lurking: Improving Community Experiences for Everyone", *Computers in Human Behavior*, Vol. 20 No. 2, pp 201–223.
- Roberts, N. (2008) *The Age of Direct Citizen Participation*, M.E. Sharpe, Armonk, NY.
- Shulman, S. (2006) "Whither Deliberation? Mass e-Mail Campaigns and U.S. Regulatory Rulemaking", *Journal of E-Gov't*, Vol. 3 No. 1 pp 41–53.
- Strauss, P.L. et al. (2011) *Gellhorn and Byse's Administrative Law, Cases and Comments*, 11th ed., Foundation Press.
- USDOT (2010a) *Limiting the Use of Wireless Communication Devices*, 75 FR 16391.
- USDOT (2010b) *Enhancing Airline Passenger Protections*, 75 FR 32318.
- USDOT (2011a) *Electronic On-Board Recorders and Hours of Service Supporting Documents*, 76 FR 5537.
- USDOT (2011b) *Nondiscrimination on the Basis of Disability in Air Travel: Accessibility of Web Sites and Automated Kiosks at U.S. Airports*, 76 FR 59307.
- Vigoda, E. (2002) "From Responsiveness to Collaboration: Governance, Citizens, and the Next Generation of Public Administration", *Public Administration Review*, Vol. 62 No. 5, pp 527–540.

Re-Inventing Democracy With a Complex Adaptive Political Crowdsourcing Platform: The Interactive Voter Choice System

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Abstract: Continuing failure of the major U.S political parties to respond to the electorate's demands, has finally brought angry Americans into the streets. The Occupy Wall Street (OWS) movement expresses the dissatisfaction of most people with the status quo: a fallen system, closed processes and patterns, its policies, and the influence of special corporate interests. People are starting to self-organize, and form new relationships in groups and networks to reinvent a more open, interactive, deliberative democracy. Two main critiques can be heard: what are the demands and who are the leaders? What kind of solutions does eParticipation have to provide to support this reinvention of democracy, and its agenda-setting and election of representative candidates, using social media, social networks, political crowdsourcing etc. This movement has all the elements of a Complex Adaptive System (CAS) in action (self-organization, emergence, relationships etc.) But how can we dis-intermediate and democratize the old legacy parties and the special corporate interests given the existing system and its rules? What role has eParticipation to play in solving these problems? What does a new political complex adaptive political crowdsourcing platform look like? In this theoretical paper we explore the implications of CAS theory and concepts for the re-visioning of eParticipation as a subsystem of eDemocracy. We offer a CAS framework and the functional requirements for a new complex adaptive political crowdsourcing platform and its tools. Next we describe the case of the Interactive Voter Choice System (IVCS) and its associated web platform, where a solution is being developed that we believe will meet these functional requirements. We advocate the use of this platform/tool, since it will empower voter-controlled, self-organizing voting blocs and electoral coalitions to dis-intermediate and democratize political parties, collectively set legislative agendas, and elect lawmakers they can hold accountable for enacting the agendas. This technology will overcome the existing impediments to popular control of governments by enabling the voters of any country to combine the collective intelligence of their electorate with the large-scale collective action power of the internet to ensure that their nation is governed by and for the people.

Keywords: eDemocracy, eParticipation, IVCS, crowdsourcing, social networks, complex adaptive systems

1. Introduction

The quality of many societal domains has deteriorated over the past decade. Incremental improvements in domains like agriculture, energy, transportation, education, labor and health care have led to short-term solutions, but at the same time structural and *wicked* problems exist (Rittel and Webber 1973). These domains are examples of people working with old solutions, within old institutions, using an old set of rules.

Our political systems and legislative processes are no exception. We have wicked problems here too. A mechanistic world view is unlikely to work in reforming our political systems. We need models for political system transformation using perspectives of complexity theory and the notion of "wicked problems", focused on the significance of co-intelligence and deliberative democracy in tackling legislative problems.

In section 2 we formulate our wicked problem in terms of the present gap between politics, citizens, and civil society. In section 3 we focus on CASs. In section 4 we formulate design principles for a new platform linking CASs with re-inventing democracy, and in section 5 we illustrate the necessary tools and web-services. In section 6 we describe a specific case where these principles and patterns are met, and in section 7 we end with conclusions.

2. The disconnect between voters, lawmakers and political parties

According to public opinion polls, a majority of Americans are deeply dissatisfied with the nation's political parties and elected representatives. There's a chasm between voters, lawmakers and political parties. The same seems true in Europe. People in developing nations are demanding democracy. But, everywhere one looks in developed countries, democracy is retreating, and Michels's (1949, p. 400) "Iron Law of Oligarchy" is triumphant.

In the U.S., most Americans believe lawmakers don't care what they think, and Congress's approval rating is at an all-time low (PeW Research 2010). Americans believe the major parties don't represent them, because neither tries to match its policies to a majority of voters' preferences (CBS News-New York Times poll 2010). Party-backed representatives frequently enact legislation opposed by the majority, and refuse to enact legislation it favors. In the U.S. millions of disillusioned voters left the two major political parties. There are now more unaffiliated voters than voters identifying with either party, which together are barely half of eligible voters.

Major party candidates often win elections with only 25% of voters. Even though most voters would like to see most federal incumbents defeated, federal and state campaign finance laws, election laws and state electoral districting laws make this impossible. Districting laws skew election results in favor of major party elite candidates. They typically ensure the defeat of other candidates, whether they are "insurgents" from within the party, or candidates from third parties.

This skewing of electoral outcomes leads voters to conclude that they have to vote for one of the major party candidates, or "waste" their vote on someone sure to lose. Dissatisfied voters alternate election cycles between major party candidates to "punish" incumbents. But the new ones ignore voters' legislative priorities, just as the old ones did.

How do we close this disconnect? How do we make political parties, and lawmakers, accountable to voters, so that they act in the interests of citizens again? What solutions can eParticipation provide to solve these problems, and enable the electorates of entire nations to self-organize outside the existing political structures and institutions? Before answering these questions, we'll provide a minimal CAS framework.

3. CAS-features and significance

It's common to try to *define* "Complex Adaptive System". But here, we *specify* our view of their essential features. The first of these is *coherence in the face of change, or "identity."* Coherence refers to maintenance of the characteristic pattern of organization of a CAS through time.

Second, *CASs are diverse in both form and capability.* They range from adaptive software agents to the International Social System, and include one-celled living systems, immune systems, and many others of diverse form, varying capability and degrees of complexity.

Third, *CASs are populated with agents (members) who learn, individually and collectively* (Firestone and McElroy 2003). Fourth, *distributed problem-solving and knowledge processing is an important feature of CASs.* Individual agents in CASs solve their own problems. In doing so, they contribute to solving CAS problems in a distributed, but organized way.

Fifth, *CASs are marked by extensive interactions among their agents.* Intermittent interactions are not sufficient to establish a CAS pattern with its complex patterning of feedback loops and reinforcements that maintains the CAS at "the edge of chaos" (Langton et al 1992).

Sixth, *CAS agents self-organize to produce emergent global behavior at the CAS level.* This is one of the most important features of a CAS. The key idea is that agents comprising it act in accordance with their own purposes and motives, in pursuit of their own goals, and that their actions produce self-organized emergent global patterns that identify the CAS.

Seventh, *CASs behave and learn partly in accordance with knowledge which can be modeled as 'rules.'* Eighth, *they also adapt by creating and using new rules as they continuously attempt to fit themselves to their environments.* The process of arriving at new rules is "creative" or "evolutionary" learning. It involves "*blind*" (Campbell 1974) generation of rules and recombination of components of old, well-established rules. Once new rules are formulated, they are subject to selection through interaction among CAS agents and interaction of the CAS with its environment.

Ninth, *the ability of CASs to successfully learn and develop new rules, or knowledge, is greater to the extent that their constituent agents are operating in problem-solving and distributed knowledge processing environments marked by relative "openness."* "Openness" must apply across various phases of the problem-solving process. It has at least two important dimensions. The first is *internal transparency* (availability and accessibility of information across CAS agents); the second is *epistemic*

inclusiveness, equal opportunity for all autonomous CAS agents to participate and interact in the problem-solving and distributed knowledge processing of the system, so that it can be more effective. Both are always found in high-performance CASs. An example taken from outside the human domain helps illustrate a pattern of (uncontaminated) epistemic inclusiveness.

Ant colonies (Hölldobler and Wilson 1990) illustrate ‘native’ CASs that rely on distributed knowledge processing informed by the individual experiences of their members, and global behaviors at the CAS level determined as a consequence of information flow among these members. There is no centralized planning or control producing collective behavior in such systems. All knowledge created by individual ants contributes to the pattern of collective knowledge reflected in changed behavioral predispositions of the ant colony, and in the pattern of pheromone trails emerging at the level of the collective. Knowledge at the global level is entirely distributed or “bottom-up” in origin, as is the learning that produces it.

Social CASs created by humans are *unlike* ant colonies. Agents in human CASs distinguish, to a much greater degree than ants do, power, authority, or influence relations, and concentrations of such relations, and of the resources that are at the basis of them. These are an emergent reality affecting human CAS interaction. The existence of such relations is an important factor distinguishing social CASs comprised of human agents, and their interactions, from other types of CASs.

Human CASs, are subject to human attempts to change the patterns of interaction and outcomes that their CASs are predisposed to produce. In fact, politics, management, and leadership is frequently about attempting to treat organizations as though they were, or ought to behave like, mechanical systems, subject to determinate cause-and-effect relations, rather than as CASs whose adaptive global behavior results from self-organization and distributed knowledge processing. Such attempts produce continual conflict between predispositions produced by interacting agents within self-organizing processes, and other predispositions produced by efforts of the powerful and influential to realize their own visions of the future through command-and-control interventions. So, human CASs constitute a type we will call Promethean CASs (PCASs), because, their normal predispositions toward behavior and distributed knowledge processing are subject to the “god-like” intervention of powerful and influential agents. That's why Michels's “Iron Law of Oligarchy” is often predictive of politics in political parties and democracies.

The movement toward oligarchy in human-based systems happens because powerful people and institutions don't like continuous self-organization, and the appearance of new ideas, ideologies, and power structures that come along with it. So, they intervene to stop or regulate it, and, in doing so, destroy the essence of democracy; the ability of people to always organize anew and disturb and even displace the policies, power structures, elites, and institutions of the past with new ones, more adaptive in solving the problems of the present and future.

The task of any CAS system is to maintain itself at “the edge of chaos.” This is difficult enough in the face of environmental influences that tend to transition PCASs either to chaotic dynamics, or to closed systems inexorably driven toward a sterile mechanical equilibrium. It is even more difficult in the context of continuing political or management interventions that frequently may amplify the strength of tendencies toward one extreme or another by changing the internal environment affecting self-organization. management, leadership, and politics. In the context of Open Enterprises and Open Societies (Popper 1945), the task is about implementing policies and programs that will support self-organization in distributed knowledge processing and problem-solving by maintaining openness in problem recognition, developing alternative solutions, and error elimination, as well as openness in communicating and diffusing new solutions across the enterprise or across society. Conversely leadership, management, and politics in such systems that undermines self-organization by repressing or otherwise manipulating it, will transition human PCASs away from openness and democracy, and towards extreme conflict systems, or authoritarian or totalitarian oligarchies (Firestone and Cavaleri 2009).

So, for democratic societies today, an important question hangs in the balance: How can we counter *tendencies toward oligarchy in our democracies by restoring self-organization and distributed knowledge processing to their proper place in reinforcing open society, democracy, and adaptiveness to environmental and societal change?* Many are looking to eParticipation innovations in democracy to provide an answer to this question. But if eParticipation is to serve that purpose, rather than the

purpose of elite astro-turfing manufacturing consent within a totalitarian oligarchy, then eParticipation platforms must fulfill certain requirements. We now turn to those.

4. Requirements for an eParticipation platform in human political CASs

We won't be able to stop the movement toward oligarchy unless we can create a new institutional framework that allows us to change those aspects of our present situation supporting oligarchy and undermining open society. We need a framework that will operate within the context of existing rules and laws to create changes supporting increased self-organization and distributed knowledge processing shifting our democratic PCASs back towards an open state.

The new institutional framework must provide *a meta-layer of political interaction and networking that places new ecological constraints on the current political system*, driving it back towards a condition in which the ability of individuals to both arrive at more accurate constructions of reality, and act on them, through increased self-organization and distributed knowledge processing, is dominant. The meta-layer can be provided by a web-based platform eventually incorporating most of the eligible voters in a political system, and providing capabilities for political organization that can overcome the impact of big money and media on political parties, legislators, legislatures, and politics generally.

Here are the requirements for such a framework. It must provide or enable:

- social contexts and milieus within which people can organize themselves and others around public policy agendas, comprised of policy options and policy priorities, into voting blocs and electoral coalitions ranging from very small to blocs of millions of voters without needing sizable financial resources from sources external to these social milieus, and without being subject to external mass media communications influenced by financial oligarchs and other special interests;
- social contexts and milieus offering the possibility of informal group and social network formation around these policy agendas;
- social contexts and milieus that are transparent and inclusive in providing participants with previously developed data, information, and knowledge, and in allowing them freedom to participate in communicating, organizing, collaborating, critically evaluating, problem solving, and decision making within voting blocs and electoral coalitions;
- social contexts and milieus in which participants have a modicum of trust in other participants;
- participants and voting blocs to communicate their policy agendas to candidates for public office and office holders, and also securing either commitments to these agendas, or clear refusals to support them;
- participants and voting blocs to continuously monitor and rate performance of office holders against agendas and to decide whether to continue to support them after performance ratings are arrived at;
- Tools for voting blocs and electoral coalitions to organize efforts to get both major party and third party candidates and initiatives onto ballots, and to get people to the polls to vote. Simply, it must provide tools to enable voting blocs to do all the things political parties now do to support candidates they want to elect and ballot initiatives they want to pass.

In brief, the new institutional framework must provide *an alternative network of social and political relations to the contemporary world* of political parties and established interest groups. The alternative world must embody the key attributes of *open society*, which means it must provide an informal communications and knowledge network that is very much independent of the mass media, and also capable of enabling creating highly cohesive voting blocs and electoral coalitions of many millions of people, and even new political parties, which can offer decisive support to candidates and office holders in return for their continuing support of voting bloc agendas. The alternative world will then work as a meta-layer constraining the prior political world, and preventing it from concentrating power in oligarchies by subjecting them to continuous self-organization and a cultural background of new knowledge arising from distributed knowledge processing.

5. IT requirements

What are the functional Information Technology (IT) requirements to provide this new meta-level of political interaction and networking? Below we specify a list of functions and facilities needed.

Application software will be available as web services within an architecture capable of easily incorporating new web-service enabled applications when they appear. Fulfilling this requirement makes the platform adaptive. Most webservices needed for our specific combination already exist:

- Facilities (e.g. forums, web conferencing) people can use to jointly clarify with one another and state the problems they see, and store the problem formulations in a knowledge base, linked to people who formulated them;
- Facilities for creating policy options, selecting others from a knowledge base, rating policy options relative to one another to establish ratio-scaled priorities, entering and storing policy options, and priorities in a knowledge base, making annotations linked to the options text, explaining why policy options make sense, and describing how they've performed;
- Facilities for gathering information both internal to the system, and across the web, to help people arrive at their policy agendas. System search facilities employing the best available semantic web technology, newly emerging in web 2.0 and 3.0 applications, to help people locate information relevant to policy option formulation. Facilities for content aggregation "mash-ups" drawing on hundreds of web sites for content related to issue areas linked to policy options. For more advanced users facilities/tools for modeling, measuring, and projecting policy impact;
- The search and content aggregation facilities mentioned, will supply people with tools to help them critically evaluate policy options, and annotation and linking capabilities will enable them to tie their evaluations to their policy options, and to create a track record that they and others will be able to use in the future;
- Facilities for accessing an already existing policy options knowledge base, using platform search capabilities, learn about other people's policy agendas, creating new policy options, and adding them to the knowledge base. Facilities for accessing existing policy options by using folksonomies established by users over time, producing content by participating in forums, by blogging and micro-blogging, and by contributing to wikis they'll create on various issues. Facilities for cognitive mapping allowing people to compare the cognitive profile of their own policy agendas with other policy agendas available in the knowledge base, helping people place their agendas in context, and preparing the way for collaboration with others in voting blocs;
- Facilities for annotating policy options and creating the track record of criticisms and evaluations of all policy options, as well as all reasoning recorded in the knowledge base supporting them. The best practices in policy and the lessons learned will be there. The history of performance will be there, and will be organized, searchable, and navigable due to the annotation and linking capability present in the platform and people's use of this capability over time;
- Facilities for social networking including building and mapping networks, and analyzing them like those in such well-known applications as Facebook and LinkedIn, and for accessing social network graphs, using social software for creating communities and discussion groups, exchanging ideas, searching for and locating experts, using text and data mining, cognitive mapping, and finding and contacting voters with statistically and/or conceptually similar priorities and cognitive maps;
- Facilities for team-based workflow so teams of people can plan and implement common tasks involving specialization, virtual team workspaces, application and desktop sharing in virtual collaborative sessions, collaborating on documents such as policy agendas, policy options, impact analyses, wikis, blog posts, and discussion forums to use in creating voting bloc coalitions;
- Facilities for project, task, and event management, web-conferencing for online meetings to recognize and formulate problems, develop solutions, criticize them, and mobilize support for policy agendas and for voting bloc campaign activities; collaborative prioritizing of policy options as well as planning and prioritizing political initiatives to get policy options passed into law; collaborative e-learning for getting access to content fragments gathered from across the internet relevant to a problem they're trying to solve, and a variety of virtual environments for social collaborative learning for teams;
- In addition to the facilities mentioned earlier, a voting/polling capability for collaborating and getting agreement in voting blocs, using agreed upon policy agendas as a legislative mandate for elected representatives and electoral candidates, a rating tool for evaluating announced candidates and recruiting new ones, a tool for monitoring elected representatives' legislative actions, and a scorecard and decision making tool for evaluating their track records and deciding whether to vote for or against them;

- Facilities for a mass e-mail blaster; "Write-your-rep" campaigns and petitions using voting bloc agendas; web conferencing between voting bloc members and reps, if they agree to attend; voting bloc donation solicitation and management; political event management; and voting bloc chapter management.
- Facilities for identity management for members, a hierarchical system of access rights guaranteeing the security of sensitive data, content, or applications, assigning access rights to any object, a central user and rights directory allowing access rights of individual users or groups to be assigned with a mouse-click. Facilities for creating unbreakable security for privacy protection including, if necessary, quantum encryption.

Next we look at the case of the reinventdemocracy.net platform and its IVCS tools being developed by a team led by political scientist Nancy Bordier (based on US Patent 7953628). It is still work in progress, presently developing a fully working prototype. The platform, IVCS tools, and voters using it will together form an open PCAS, solving the wicked problem of overcoming Michels's Iron Law which, today, is threatening to transform the US and other modern democracies into oligarchies (Bordier and Firestone 2011).

6. The IVCS platform: A case study

All systems using IT and human agents relating people to one another, including political parties, and formal organizations generally, are PCASs, and in their formative stages after the introduction of the IT component to users will involve some additional degree of self-organization, network effects, and emerging collective behavior patterns, beyond that existing before introducing the technology. But, some IT platforms/tool sets will do a better job of enabling self-organization initially, and maintaining it continuously, than others. That means that some applications will serve democracy better than others in that continuous enabling of new self-organization outside any formal organizational structure within their IT application environments will more effectively prevent formation of entrenched oligarchies than will other applications ostensibly directed at similar problems.

How well IT platforms trying to heal modern democratic political systems such as the United States, will perform in enabling self-organization depends in great part on the power of their central symbols, or "tags" (Holland, 1995) to attract self-organizing activity with a propensity to generate higher-level collectives such as voting blocs and electoral coalitions out of the self-organization.

The IVCS is a platform and set of tools being developed that is expected to fulfill all the e-platform requirements given above. It has policy options as its key tags, the central symbols around which people will self-organize to create voting blocs and electoral coalitions. In addition, when using IVCS, people prioritize their policy options and create policy agendas based on their options and priorities. Policy options, priorities, and policy agendas are the most effective tags for political self-organization because 1) people can locate others based on similarities in these matters, and 2) they can also engage in developing voting blocs and electoral coalitions by first finding people whose agendas are similar to their own, and then negotiating out differences among them by collaborating on how policy agendas may be changed, consensus created and differences resolved.

And because of these tags and other features that enable and encourage participation in the process of building voting blocs and electoral coalitions by negotiating and re-negotiating policy options, priorities, and policy agendas, IVCS is the platform that can best maintain continuous self-organization, continuous refreshing of "bottom-up", democratic participation, in building and rebuilding voting blocs and electoral coalitions. The most important thing is that CASs are always poised at "the edge of chaos," between the disorder of chaotic dynamics and the orderly dynamics of lifeless mechanical equilibrium. They remain in this state, because their continuous self-organization allows them to cope with environmental challenges through problem solving. Their continued existence as PCASs, therefore, depends on this continuous self-organization. If that fails or is undermined by the institutionalization of oligarchies that can protect themselves from replacement, then the adaptive capabilities of the PCAS will fail and it will change its state.

The IVCS enables the U.S. electorate to bypass the current system and circumvent institutions that have corrupted it. It does this by enabling voters of all persuasions to build voter-controlled on-line voting blocs and electoral coalitions that can get control of all vital processes that determine what the nation's legislative priorities are, who runs for office, who gets elected, what laws are enacted, and which office holders will be made accountable for breaking their commitments made to voters prior to

their elections. These blocs and coalitions can work together outside the system, *prior to elections*, to democratize political parties so that their supporters control them rather than special interests. The blocs and coalitions can form alliances with democratically-run parties while supplanting all parties as the driving forces of U.S. politics (see figure 1).

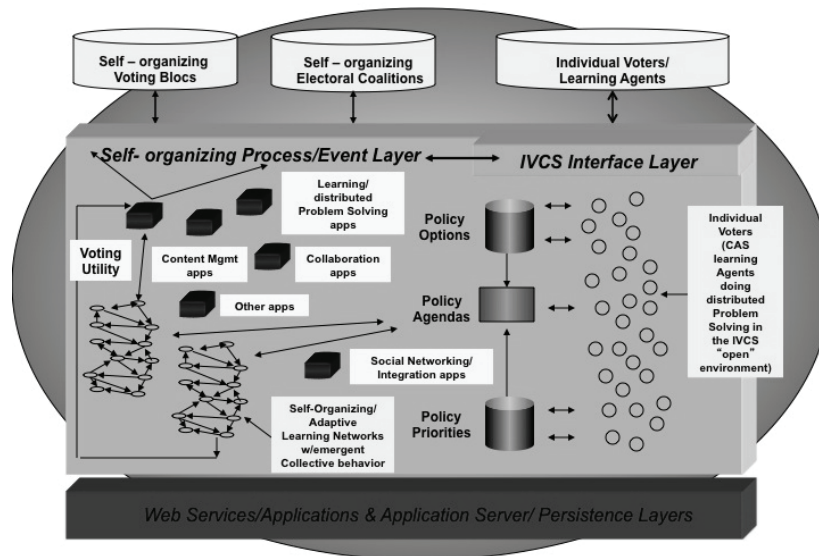


Figure 1: IVCS as PCAS with self-organizing emergent collectives

IVCS's *agenda-setting, political organizing and consensus-building tools* enable voters to set their legislative agendas and build voting blocs and electoral coalitions to elect representatives who will enact their legislative priorities, not special interest priorities, into law. The tools empower voters to change the whole political system by creating self-organizing voting blocs and electoral coalitions that can perform all functions political parties perform to get their candidates elected, and their legislative agendas passed. This includes raising money for their candidates from individual donors throughout the country, rather than special interests.

In addition to doing the same things that parties do to run winning candidates, the voting blocs and coalitions that voters build, using IVCS tools, can do two things absolutely essential to democracy that traditional political parties have *failed* to do. First, they can overcome the parties' failure to allow voters to collectively set and vote on party platforms and legislative agendas. And second, the IVCS and its consensus-building tools, especially the voting utility, collaboration, and problem solving tools, and knowledge bases containing both claims and meta-claims, enable voters to resolve conflicts. Space limitations prevent our dealing with IVCS in more detail; more information can be found on the place-holder website: <http://www.reinventdemocracy.net/>.

7. Conclusions

Aristotle pointed out that monarchies were subject to transformation to tyrannies, aristocracies to oligarchies, and constitutional governments to democracies (mob rule). He had no way of knowing that such transformations may have something to do with whether the processes of self-organization decay to such a degree that lack of adaptive success in each of these systems drives their transformation to their perverted forms.

He also had no way of envisioning the need for modern constitutional liberal democracies to continuously renew themselves with new distributed '*wicked*' problem-solving capabilities and accountability mechanisms that can only be produced through openness and self-organization supported through modern IT web-based eParticipation platforms. These platforms can provide a meta-layer of new knowledge, cultural norms, and self-organization, for democratic political systems, unconstrained by and not open to, manipulation by emergent globalizing elites.

Without these new eParticipation platforms, and the continuous self-organization they will bring, the iron law of oligarchy will continue to dominate representative democracies, and they will travel further

along the real road to serfdom. IVCS can create the meta-layer necessary to strengthen self-organization into voting blocs, electoral coalitions, and web-based social networks in such a way, that new policy solutions can be continuously introduced, along with new mechanisms of accountability. That meta-layer can ensure that policy elites either become representative, or are quickly replaced by new officeholders who won't rely on the financial and organizational resources now co-opting self-organizing movements, the heart and soul modern democracies. It can repeal the Iron Law!

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References

- Bordier, N. and Firestone, J. (2011) "A System-changing Solution for the OWS Movement", [online], Correntewire, http://www.correntewire.com/a_system_changing_solution_for_the_ows_movement (accessed on 01/01/2012).
- Campbell, D. (1974) "Evolutionary Epistemology", in Schilpp, P. (ed.) *The Philosophy of Karl Popper*, Open Court, LaSalle.
- CBS News-New York Times poll (2012) [online] http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aEsowrlv31_g (accessed on 07/02/2012)
- Firestone, J. and McElroy, M. (2003) Excerpt #1 from *The Open Enterprise – Building Business Architectures for Openness and Sustainable Innovation*, KMCI Online Press, Alexandria, VA.
- Firestone, J. and Cavaleri, S. (2009) "The Problem Solving Pattern Matters: Part Four, Enhancing the PSP or PSP Pattern Management", [online], KMCI, <http://kmci.org/alllifeisproblemsolving/archives/the-problem-solving-pattern-matters-part-four-enhancing-the-psp-or-psp-pattern-management/> (accessed on 01/01/2012).
- Holland, J. (1995) *Hidden Order*, Helix/Addison-Wesley, Reading.
- Hölldobler, B. and Wilson, E.O. (1990) *The Ants*, Harvard University Press, Cambridge.
- Langton, C., Taylor, C., Farmer, D. and Rasmussen, S. (eds.) (1992) *Artificial Life II*. Santa Fe Institute Studies in the Sciences of Complexity, Proceedings vol. 10, Addison-Wesley, Redwood City.
- Michels, R. (1949) *Political Parties: A Sociological Study of the Oligarchical Tendencies of Modern Democracy*, The Free Press, Glencoe.
- PeW Research Center Publications. (2010) "Distrust, Discontent, Anger and partisan Rancor" [online] <http://pewresearch.org/pubs/1569/trust-in-government-distrust-discontent-anger-partisan-rancor> (accessed on 07/02/2012)
- Popper, K. (1945) *The Open Society and Its Enemies*, Vols. 1 and 2., Routledge and Kegan Paul, London
- Rittel, H. and Webber, M. (1973) "Dilemmas in a General Theory of Planning", *Policy Sciences*, Vol. 4, pp 155-169.

An Investigative Study of Promoting Awareness and Increasing Registration of PAYE Anytime in the Border Midlands West Region

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Abstract: This paper discusses promoting the awareness of electronic channels of communication (eGovernment) used by tax administrations, with particular emphasis on the Irish tax administration. The purpose of the paper is to investigate awareness of electronic channels and its link to increased use of these channels by Irish taxpayers. It should be noted that in the current economic climate, the increased use of electronic channels can represent a saving to tax authorities, as there is less direct communication with customers, therefore research in this area is of particular merit to tax authorities in general. In Ireland, the electronic channel offered to PAYE (Pay as You Earn) customers is called 'PAYE Anytime'. Statistics available from the Irish Revenue authorities ('Revenue') show that registration and use of PAYE Anytime is higher in the East of the country compared to the West. This paper seeks to investigate this anomaly by focusing on the use of PAYE Anytime (or lack thereof) in the West of Ireland, specifically the Border Midlands West ('BMW') Region. Empirical research is undertaken to investigate and understand the factors that may influence a customer's decision to use electronic channels. This research focuses on the Technology Acceptance Model ('TAM') and its two underlying factors - perceived ease of use and perceived usefulness. Prior research conducted by Revenue on PAYE Anytime is also discussed and analysed, with statistics from this research being compared with the results from a pilot survey undertaken on taxpayers in the Border Midlands West Region. Overall, the survey found that although there has been an increase in the awareness of PAYE Anytime, there needs to be a sustained programme for promoting PAYE Anytime in order to increase registrations and usage of this electronic channel of communication. The remainder of this paper is set out in five parts. Part one introduces PAYE Anytime and describes the rationale for conducting this research; part two discusses empirical research on TAM and previous literature on PAYE Anytime; part three details the research methodology, part four provides an analysis of the survey results and part five provides conclusions with recommendations arising from the study.

Keywords: eGovernment, electronic channels, PAYE Anytime, TAM, Revenue

1. Introduction

PAYE Anytime is a relatively new channel of communication used by Revenue, having been introduced in 2006 and updated substantially in 2009. It is an internet-based system offered by Revenue to PAYE employees, enabling them to manage their tax affairs electronically 365 days a year. Its aims are to be user friendly, easy to use and result in faster repayments than the more traditional methods of communication such as postal correspondence.

While tax on employees' salaries is collected at source by employers, by registering with PAYE Anytime, employees can update their tax credits, claim refunds and voluntarily disclose other incomes that are not subject to tax under the PAYE system. From a Revenue perspective, by analysing PAYE Anytime user records, Revenue can determine the profile of the PAYE Anytime user. It allows Revenue to conduct research and analysis of perceived risks within the system and provide corrective action swiftly.

Revenue initially aimed to have at least 300,000 people using PAYE Anytime by 2010. Recent figures available from Revenue state that 504,557 customers had registered for PAYE Anytime by the end of 2010, an increase of 36% on 2009 (Revenue 2011). These customers represented approximately 25% of the PAYE customer case base. In addition, statistics contained in its 2010 annual report showed that 360,624 transactions were dealt with through PAYE Anytime in 2010. This indicates that although there was a significant increase in the amount of users, and that the overall registration target was surpassed, the percentage of customers who processed transactions on the service was just 71% of the total amount registered for the service.

Latest estimated figures for the BMW Region for August/September 2011 for PAYE Anytime registrations as a percentage of case base show an increase from 20% in 2010 to 22% in 2011 (O'

Mahony 2011). This is the lowest registration percentage of the four tax regions nationwide. In comparison, the amount of registrations as a percentage of case base in the Dublin region has remained consistent at 32%. Therefore, more focus is needed on the BMW region to try and establish why the registration rates are lower and furthermore, how these registration rates can be increased to the targeted average of 30% of total case base. This project aims to understand the reasons why people decide whether or not to use electronic filing systems, and in particular PAYE Anytime, within the BMW Region.

In order for an electronic system to be implemented successfully one must look at the factors that influence whether a customer chooses to use or not to use electronic filing services. There are a number of previous studies highlighted to discuss the factors which may impact on the use of electronic filing services. With this in mind, the Technology Acceptance Model (TAM) is looked at in depth. The project also discusses prior research carried out by Revenue on PAYE Anytime and the segmentation of PAYE users. In order to further the research on PAYE Anytime and to aid with future promotion, primary research carried out by the author is discussed. By using both primary and secondary research the authors identify whether the factors listed in the TAM model - which have been adopted by Revenue in its PAYE Anytime service - have been effective so far. The project looks at the responses from this survey as to why customers who have registered for PAYE Anytime in the BMW region have not used the service. It also looks at the responses from customers who have used the service previously but do not still use the service. The research looks at studies carried out around the world and discusses the results and their recommendations for the successful use of electronic filing services by customers.

2. Literature review

One of the main reasons for the move towards electronic filing channels, according to the BMW Regional Business Plan 2011, is that Revenue wishes to make savings on available resources. There is a dearth of empirical research into customers' behaviour and its resulting impact of use/non-use of electronic tax systems. A study by Wang (2002) identifies the importance of customer behaviour and customer acceptance of electronic systems:

"There is a need to understand the acceptance by the users of the electronic tax-filing systems, and identify the factors that can affect their decision to use or not to use these electronic tax-filing systems. This issue is important in that the answer could help the government to plan and promote new forms of electronic tax-filing systems in the future"
(p 334).

For the purpose of this research the authors identify discuss the technology acceptance model (TAM) and then examine prior research undertaken by Revenue on PAYE Anytime thus far.

2.1 Technology acceptance model

In 1985, Fred Davis proposed the concept of the technology acceptance model (Legris et al 2002) as a means of examining the relationship between perceived ease of use, perceived usefulness and external variables on the probability of system use. TAM as a model sought to examine customers beliefs and behaviours and their resulting impact on whether a customer chose to use a system or not based on their perception of the potentially usefulness of the system. TAM has two underlying factors/beliefs: perceived ease of use (PEU) and perceived usefulness (PU). In terms of perceived ease of use, this refers to "the degree to which a person believes that using a particular system would be free of effort" (Davis 1989, p 320). Perceived usefulness, as a concept/belief held by the customer, is that the electronic filing system must serve a purpose and they can achieve an objective by using the system. Of significant merit to PEU and PU is computer self-efficacy.

Computer self-efficacy is defined as "An individual's perceptions of his or her ability to use computers in the accomplishment of a task" (Compeau and Higgins in Wangpipatwong et al, 2008, p 55). Computer self-efficacy has a behavioural influence on customers' perceptions of their ability to use computers and carry out transactions online. Therefore, customers' perceptions in terms of computer self-efficacy are of paramount importance as self-efficacy is "concerned not with the skills a person has; rather, it reflects what individuals believe they can do with the skills they possess" (Hsu and Chiu, 2008, p 369).

Along with the two factors, PU and PEU in the TAM model, a third factor is now introduced- perceived credibility. Perceived credibility, as the name suggests, is that customers believe that the electronic filing system is credible and trustworthy and does not provide a risk to them by using it. This is reiterated by Wang (2002) who states that "...user's perceived credibility of Web systems has a marked influence on user willingness to engage in online exchanges of money and personal sensitive information" (p 336). Linked to perceived credibility is the issue of perceived risk.

Perceived risk is defined as "The overall amount of uncertainty or anxiety perceived by an individual in using e-filing" (Azmi and Kamarulzaman, 2010, p 599). Perceived risk is discussed by Pavlov (2003) who identifies two major concerns for customers in the decision to use/not to use online systems.

The first of these concerns is the risk of monetary loss when carrying out online transactions. The second concern is the risk of loss of confidentiality. While Pavlov (2003) discusses perceived risk in the context of e-commerce the same approach can be adapted when researching customer behaviour for electronic filing systems.

2.2 Studies/research on TAM

There have been many studies/surveys carried out to inform empirical research on TAM. Wang (2002) carried out a telephone survey. The focus of the survey was on the extended TAM (PEU, PU and computer self-efficacy) and its aim was to analyse the impact of computer self-efficacy on technology acceptance. Results of the survey found that:

"users who have higher computer self-efficacy are likely to have more positive usefulness and ease of use beliefs, but also will have more negative credibility belief about the electronic tax-filing systems" (p 345).

Overall, the study found that there is an important relationship between computer self-efficacy and perceived ease of use, which is in line with other empirical research in this field. Wang (2002) advocates for the "development of computer self-efficacy of the citizens and civil servants by training and education in schools, government, business and society" (p 347).

A study by Wangpipatwong et al (2008) investigated factors which resulted in customers' intention to continue using eGovernment websites. Although the study does not focus specifically on electronic filing services, the results nevertheless can be utilised in a general context in looking at TAM. They found that "Perceived usefulness was the strongest predictor of continuance intention" (p 62). They also found that there was a strong relationship between perceived ease of use and perceived usefulness. Training and education as a means of engaging with customers and encouraging computer self-efficacy is also recommended by Wangpipatwong et al. (2008). They also discuss those customers' who have lower computer self-efficacy- these would include customers on low incomes and who have low levels of education. They suggest that future research in this field should "elicit the data from those citizens who have lower levels of education, lower income, and also citizens who lack access to the internet" (p 63).

Hsu and Chiu (2004) investigated customers' intentions and behaviours when using electronic filing services. One of their main findings was that "attitude toward the e-service usage was the major determinant of behaviour intention" (p 378). Behaviour intention, as a result, they found impacted on e-service usage. Other findings from this study found that perceived usefulness shaped a customer's positive attitude towards electronic filing services and perceived risk resulted in a customer having a negative attitude towards electronic filing services. Davis (1989) who initially proposed the concept of TAM, carried out two studies which focused on perceived ease of use and perceived usefulness and their resulting impact on user acceptance of technology. Davis found that in both studies perceived usefulness had a greater connection with customers' usage behaviour than perceived ease of use did. One of Davis (1989) main findings was that "perceived usefulness is a strong correlate of user acceptance and should not be ignored by those attempting to design or implement successful systems (p 334).

Pavlov (2003) carried out two studies which had a focus on perceived risk and perceived uncertainty. The combined results of these studies revealed that in order to increase customer acceptance of e-commerce, customer uncertainty from perceived risk must be reduced. A study carried out by Fu et al (2006) investigated the behaviour of taxpayers who filed tax returns manually and compared these

findings with taxpayers who filed their returns online. They found that behavioural intention was largely driven by perceived usefulness.

There are many different factors that contribute towards whether or not a customer decides to use electronic filing services. There are a number of models proposed regarding technology acceptance and all of these models are interrelated. Empirical research, as discussed previously, has shown that perceived usefulness and perceived ease of use are the most important beliefs that need to be taken into account in relation to TAM.

2.3 Prior research on PAYE Anytime

Previous research has been carried out on PAYE Customer Service and specifically PAYE Anytime by Revenue. There was a survey carried out in 2007 and further research was carried out in 2009-2010. One of the key findings in the 2009-2010 research carried out by the Research & Analytics branch of Revenue was that the majority of customers found PAYE Anytime easy to use. In the 2009-2010 survey asked customers to rate the usefulness of sources of information used by Revenue. In its Results and Analysis section of the 2009-2010 survey carried out by Revenue Research and Analytics branch the main finding noted on the above question is "The fact that PAYE Anytime and the website are rated in the 90% range is a very encouraging measure of the helpfulness of Revenue's electronic sources of information" (Revenue, 2011, pp 10). As perceived use is one of the main determinants of technology acceptance in line with the TAM, this represents a very positive result for Revenue.

In line with Revenue's objective to increase the use of electronic channels and to reduce the amount of direct contacts by customers to Revenue, research was undertaken by Clancy et al (2010) on the segmentation of PAYE Anytime users by Revenue. The main aims of this research was to establish who are the PAYE Anytime users, what do PAYE Anytime customers use PAYE Anytime for and how can the PAYE Anytime service be improved. In this research they note that: "Examining the customer-led interaction on PAYE anytime may assist in a greater understanding of the needs, attitudes and behaviours of these PAYE Customers" (p 104).

3. Pilot study - research methodology

As PAYE Anytime is still a relatively new phenomenon, it was decided that primary research would be the most beneficial way to inform prior research in this area. To conduct an investigative/pilot study a questionnaire survey was the chosen research method. The authors acknowledge that a statistically relevant survey would have been ideal; however, this was not feasible, given the pilot nature of the study and various logistical constraints placed upon the authors at the time of the study. Instead, a convenience sampling method was employed, that is, "Sample members are chosen on the basis of their being readily available/accessible" (Diamantopoulos and Schlegelmilch 2000, pp 14).

The survey's main aim was to investigate if customers were aware of the PAYE Anytime Service in the BMW region and if so, how they become aware of it. Linked to the awareness of the service were the numbers of registrations for the service within this region. The survey probed how many customers had registered for PAYE Anytime. Customers must register for PAYE Anytime using the Revenue website; therefore the survey asked respondents whether they had used the Revenue website. From the findings of the survey it was hoped to establish effective ways of promoting and creating awareness of PAYE Anytime in the BMW region.

To ensure a diverse sample was selected it was decided that the survey would be conducted over two weekends in a busy shopping centre in Galway City (the primary urban centre of the BMW region). This time and location was chosen as it would ensure that the sample chosen would have the best possibility of being as diverse as possible. This would in turn go a significant way to ensure that the sample represented as realistic a sample of the target population (i.e. those in the BMW region most likely to use PAYE Anytime) as possible. By randomly selecting customers in the shopping centre and asking them to complete a questionnaire, any possible bias was limited.

A cover sheet was provided to accompany the questionnaire, outlining the purpose of the research, how long the questionnaire would take to complete, and provided contact details for the lead author, the author's supervisor and for the Administrator of the Kemmy Business School Research Ethics Committee (KBSREC).

The questionnaire contained 15 questions. In terms of the format of the questionnaire there was a mix of dichotomous questions/determinant choice/checklist and open ended questions. It was expected that the use of these types of questions would yield the most relevant replies for the purposes of this research into PAYE Anytime. The questionnaire was pilot tested on a number of colleagues to ensure that the questionnaire was easy to understand. The questions were worded in a clear and unambiguous manner in order to eliminate any possible bias. There were a few minor changes made to the questionnaire as a result of recommendations made from this test group before the survey commenced.

4. PAYE Anytime survey - results

This Part discusses and analyses the results of the PAYE Anytime survey. Where possible, comparisons are made between this survey and previous research carried out by Revenue on PAYE Anytime.

As can be seen from the results of the survey, especially in terms of the demographic profile, there was a varied sample of customers who agreed to participate in the survey. From those customers asked to complete a questionnaire, a total sample of 90 questionnaires were completed by customers. Clancy et al. (2010) found that 90% of the total amount of customers throughout Ireland that used PAYE Anytime were under 49 years of age. Respondents to the BMW survey between the ages of 18 and 55 years of age represented 94% of the total sample.

The majority of respondents who participated in the survey were employed (69 customers) and of those 25 respondents who had registered for and used PAYE Anytime (see 4.1.3), 10 respondents worked in the private sector, 12 worked in the public sector and the remaining 3 respondents were currently unemployed.

The breakdown of highest education level completed by respondents was as follows: 63 respondents had completed third level education, 26 respondents had completed second level education and 1 respondent had completed primary level education. Of the persons who used PAYE Anytime 21 respondents had completed third level education and 4 had completed second level education.

4.1.1 Usage of Revenue website

The survey found that the 44 of the 90 respondents used the Revenue website while 52 respondents (representing 58% of the total sample) had heard about PAYE Anytime. Results from the 2009-2010 PAYE Customer Survey indicated that approximately 35% of customers used the Revenue website to source information.

The survey asked customers if they were aware of the availability of PAYE Anytime in Revenue Local Enquiry Offices and public institutions such as public libraries. From the 90 respondents who participated in the survey, 22 customers were aware that it was possible to access PAYE Anytime in the Revenue Local Enquiry Office.

The survey found that the Revenue website and the Lo-call 1890 service together represent 58% of the total means of how respondents had heard about the PAYE Anytime service. Responses under the 'Other' category included word of mouth, colleagues and friends and correspondence from Revenue.

4.1.2 Reasons not registered for PAYE Anytime

It was found that a total of 32 respondents had registered, representing 36% of the total sample. Of those respondents who had not registered for PAYE Anytime, only a minority cited lack of internet access for their failure to register. The largest proportion of the respondents replied that although they had heard of the service, they felt unfamiliar with how the PAYE Anytime service actually operated. One respondent felt that they would be unable to use the service; this displays a perceived low computer self-efficacy. Responses under the 'other' category included those who expressed no interest in registering for the service and those who preferred other channels of communication with Revenue such as calling into the Local Enquiry Office.

4.1.3 Awareness/Use of PAYE Anytime

The next finding was that from a total of 32 respondents who registered for PAYE Anytime, 25 of these customers have used the service. This shows a marked improvement in the number of customers using the service after completing the registration process. Respondents were asked how they used PAYE Anytime. One of the main uses cited by respondents who used the PAYE Anytime service was to claim tax credits. Other reasons included requesting PAYE P21 Balancing Statements. The survey probed if respondents still used the service. Of the 25 respondents who had used PAYE Anytime, 21 of these respondents still use PAYE Anytime. Reasons mentioned why respondents did not continue to use PAYE Anytime after they had registered included forgetting their PIN (Personal Identification Number) to login to the service, no tax rebate due as refund already claimed, and unfamiliarity with the tax credits that could be claimed online.

5. Conclusions and recommendations

In looking at relevant empirical research on TAM, which focuses on the relationship between perceived ease of use and perceived usefulness of electronic filing systems, the paper investigates the factors, which influence the decision of a customer within the BMW region whether or not to use the PAYE Anytime service.

The authors do acknowledge that the generalizability of the findings is limited, given the lack of statistical robustness of the methodology employed. Despite this, the authors believe that the findings should nonetheless be of interest to tax administrations throughout the world in terms of the challenges of tax-related e-compliance facing taxpayers and administrators alike.

Wang (2002) advocated for “development of computer self-efficacy of the citizens and civil servants by training and education in schools, government, business and society” (p 347). The authors concur with Wang in this respect based on the findings of the survey and the recommendations proposed.

The results of the survey indicate that there is a growing awareness of the Revenue website as a means of sourcing information on customers’ tax entitlements. Despite the growing awareness of PAYE Anytime, the results would suggest that is an area that needs to be constantly addressed by Revenue. There were a large number of respondents that felt unfamiliar with PAYE Anytime and how the system operates. This presents an opportunity for Revenue to advertise PAYE Anytime more prominently on their website to potentially increase the number of registrations for this service. In conjunction with this, it would seem that further education in relation to the operation of the tax system, particularly in relation to tax credits, is merited.

Those respondents that did use PAYE Anytime perceived it as useful. This would suggest that more focus needs to be placed on computer self-efficacy. In addition, the analysis of the age-profile of those respondents who use PAYE Anytime would suggest that customers over the age of 56 should be targeted and made aware of PAYE Anytime. However, it would be worthwhile to first of all establish these customers views in relation to the perceived ease of use and perceived usefulness of the service.

In order to increase awareness of PAYE Anytime in the BMW region and to increase the number of registrations for the service, there must be a sustained marketing strategy employed. Indeed, as reported by the OECD (2010) in their survey on electronic services for taxpayers:

“Short of imposing mandatory requirements which may present their own problems, there were no “silver bullets” for rapid success towards achieving good outcomes; a considerable investment of time, money and staff was inevitably required over a fair period of time to achieve a good level of success” (p 41).

From the findings of this survey as noted above, and comparing these findings with prior research on PAYE Anytime, further recommendations on how to increase awareness of (and in turn increase registration for) this service in the BMW region are set out below:

- Facilitators for PAYE Anytime should be provided on an ongoing basis in Revenue Local Enquiry Offices. If this is not possible then all staff who work in the Local Enquiry Offices should act as facilitators by continually promoting the service to customers and offering to register customers at this point of contact. This can be a cost effective means of increasing awareness of the service.

- Revenue officials should be present at Citizen Information Bureau's information evenings. These information evenings are generally held one to two times per month. This would provide Revenue with the opportunity to increase awareness and increase registrations of PAYE Anytime in a cost and labour effective manner.
- Revenue should continue to target third level institutions to increase awareness of PAYE Anytime in the BMW Region. As students represent the future workforce in the country, providing them with information on PAYE Anytime as early as possible in their working lives and encouraging them to register, should result in increased use of PAYE Anytime into the future within the region.
- Revenue should approach secondary schools within the region to target both the staff and the students in making them aware of PAYE Anytime. As some students may have part time jobs, it presents an opportunity for Revenue to provide awareness of the service to this age segment.

Although Revenue does not have a large budget to promote PAYE Anytime, it does have the necessary trained staff that can assist by promoting PAYE Anytime when customers contact Revenue through the numerous channels of communication available. These staff can implement the recommendations in this paper at a minimum cost to Revenue. This should ensure that the BMW Region should meet its targets for the number of PAYE Anytime as a percentage of case base.

References

- Azmi, A. and Kamarulzaman, Y. (2010) 'Adoption of e-filing: A conceptual paper' *African Journal of Business Management* Volume 4 (5), p 599-603
- Clancy, J, Manai, G and Cleary, D 'Segmentation of the PAYE Anytime Users' in *Electronic Journal of eGovernment* Volume 8 Issue 2 2010, p 105-120, available online at www.ejeg.com
- Davis, Fred (1989) 'Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology' *MIS Quarterly* Volume 13, No. 3 p 319-340
- Diamantopoulos, A. and Schlegelmilch, B. (2000) *Taking the Fear Out of Data Analysis*, London: Thomson Learning
- Hsu, M.H. and Chiu, C.M. (2004) 'Internet self efficacy and electronic service acceptance' *Decision Support Systems* Volume 38, p 369-381
- Legeris, P., Ingham, J. and Collette, P. (2002) 'Why do people use information technology? A critical review of the technology acceptance model' *Information & Management* Volume 40, p 191-204
- OECD, Forum on Tax Administration: Taxpayer Services Sub-Group (2010) *Survey of Trends and Developments in the Use of Electronic Services for Taxpayer Service Delivery* [online], available: <http://www.oecd.org/dataoecd/20/49/45035933.pdf> [accessed 15 June 2011]
- O' Mahony, D. (2011) Re: PAYE Anytime Registration- Break down by county/district as a percentage of case base, e-mail to Josephine Foley (jfoley00@revenue.ie), 27 September 2011 [accessed 27 September 2011]
- Pavlov (2003) 'Consumer Acceptance of Electronic Commerce: Integrating Trust and Risk with the Technology Acceptance Model' *International Journal of Electronic Commerce* Volume 7, No 3 p 101-134
- Revenue, Research and Analytics Branch (2011) *PAYE Customer Survey 2009-2010* [online], available: <http://www.revenue.ie/revsearch/search.jsp> [accessed 14 June 2011]
- Revenue, Research Unit (2008) *PAYE Customer Survey 2007* [online], available: <http://www.revenue.ie/revsearch/search.jsp> [accessed 14 June 2011]
- Revenue (2011) *Revenue Annual Report 2010*: Dublin, Office of the Revenue Commissioners Revenue, available: <http://www.revenue.ie/en/online/ros/faqs-pay-anytime.html> [accessed 16 July 2011]
- Unpublished Revenue Conference Paper, (2010) 'BMW Business Plan 2011 Conference', Athlone, 30 November 2010 [accessed on Revnet, BMW General/ BMW Region/ 2011 Business Planning Process/ Business Planning Conference Presentations]
- Wang, Yi Shun (2002) 'The adoption of electronic tax filing systems: an empirical study' *Government Information Quarterly* Volume 20, p 333-352
- Wangpipatwong, S., Chutimaskul, W. and Papasratorn, B (2008) 'Understanding Citizen's Continuance Intention to Use eGovernment Website: a Composite View of Technology Acceptance Model and Computer Self-Efficacy' *The Electronic Journal of eGovernment* Volume 6 Issue 1, p 55-64

Selecting Generic top Level Ontologies for the eGovernment Domain

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Abstract: In recent years, ontologies have attracted eGovernment developers as promising tools for developing eGovernment systems that can be easily integrated and interoperated. As a result, a plethora of ontologies describing various aspects of eGovernment services delivery have been developed in various researches and projects. Appropriate criteria need to be defined and applied to select those of these ontologies that best conceptualize and describe the eGovernment domain; this will promote the reuse of these generic top level eGovernment domain ontologies and strengthen consistency in the development of semantic eGovernment portals. This study investigates existing eGovernment domain ontologies and applies a set of predefined criteria to select the best suited set of ontologies for the eGovernment domain. Firstly, a literature review is carried out to identify existing eGovernment domain ontologies. Secondly, the identified ontologies are analysed and classified based on their area of application in the eGovernment domain. Thirdly, various metrics including semantic coverage, open availability, codification language, and modularity are applied to evaluate and select the best set of top level ontologies for the eGovernment domain. The selected ontologies provide the best sharable and reusable conceptual representation and description of the public administration domain as well as the electronic services delivery processes; thus, they could be used as generic top level ontologies for the eGovernment domain. The main contribution of the study is the investigation and selection of generic top level ontologies for the eGovernment domain; this might (1) promote the reuse of existing generic top level eGovernment domain ontologies, (2) save the time and cost needed for building new ontologies in eGovernment projects, (3) prevent inconsistency and confusion due to multiple semantic representations of the same eGovernment domain knowledge in the semantic eGovernment development community and (4) represent the starting point for the adoption of standard ontologies for the eGovernment domain.

Keywords: eGovernment domain ontology, ontology reuse, generic top level ontology, ontology selection metrics

1. Introduction

Developing and deploying web-based systems for online services delivery to citizens remains an important mandate of eGovernment development worldwide. This requires the reengineering of the public administration domain using state-of-the-art technologies such as ontology. In recent years, eGovernment developers have employed different kinds of ontologies to model and specify various aspects of eGovernment services delivery, aiming at developing eGovernment systems that can be easily integrated and interoperated for seamless service delivery to citizens.

Hodgson and Allemang (2005) present the Federal Enterprise Architecture (FEA) Reference Model Ontologies (FEA-RMO) and the FEA capacities advisor ontologies. The FEA-RMO is set of 5 ontologies derived from the FEA eGovernment reference model of the United States (US) government, whereas, the FEA capacities advisor ontologies is a set of 6 ontologies developed to provide US government agencies with advises on the available capacities that could support eGovernment initiatives.

The semantic components of the Italian eGovernment architecture, the Estonian semantic interoperability architecture and the Palestinian interoperability framework are presented in Baldoni et al. (2007), Luts (2004) and Jarrar et al. (2011) respectively. The Italian eGovernment architecture (Baldoni et al. 2007) includes an ontologies repository, which is composed of a set of ontologies and schemas that describe the services and information semantics. The ontology component of the Estonian semantic interoperability architecture (Luts 2004) is a set of domain ontologies that describe objects including web service operations, business processes and data structure. The Palestine interoperability framework (Jarrar et al. 2011) includes a government ontology formed of a set of 15 domain ontologies which describe data concepts, services and processes of the Palestine government.

Various different aspects of eGovernment have been modeled in academic research studies using ontologies (Sanati and Lu 2009; Chen et al. 2008; Gugliotta et al. 2005; Xiao et al. 2007; Sabucedo and Rifon 2006; Sabucedo et al. 2010; Puustjarvi 2006). Sanati and Lu (2009) use life-event ontology to model the e-services integration processes. In Chen et al. (2008), a framework for services integration based on specific ontologies is proposed, whereas, Gugliotta et al. (2005) established the mapping of various ontologies to a predefined eGovernment system reference model, with the purpose of achieving services integration and interoperability for one-stop portals. The issue of services interoperability is also addressed in Xiao et al. (2007), Sabucedo and Rifon (2006) and Sabucedo et al. (2010), with eGovernment specific ontology models. Another relevant literature by Puustjarvi (2006) proposes a process-document ontology model for the business process modeling in eGovernment.

Several European based eGovernment projects employ ontologies to describe and specify the public administration domain as well as the eGovernment services delivery processes. In this study, 9 of these projects are identified and studied; they include: OntoGov, Reimdoc, OneStopGov, SemanticGov, SAKE, TerreGov, SmartGov, Access-eGov, and Estrella. The OneStopGov project uses life-event ontology to model public services (Todorovski et al. 2006) while the issue of composition, reconfiguration and evaluation of e-services is addressed in the OntoGov project (Apostolou et al. 2005a, 2005b) with various kinds of ontologies. The real-estate transactions are described with a set of ontologies in the Reimdoc project (Ortiz-Rodriguez and Villazon-Terrazas 2006). Another set of ontologies is used in the SAKE project (Butka et al. 2006) to model the public administration workflow and business processes, and to describe the structure of information or metadata as well as the concepts related to the performance evaluation of the public administration's processes. The Government Enterprise Architecture (GEA) ontology (Goudos et al. 2006, 2007), created from the GEA object model (Peristeras and Tarabanis 2006), is developed in the SemanticGov project to model the public administration semantic as well as the overall eGovernment domain; the reference ontology is also used to enable the automatically mapping of citizens' needs to suitable public services. The SmartGov project (Fraser et al. 2003) presents the eGovernment services ontology that models the business process and social aspects of eGovernment services delivery. Another interesting work is done in the Estrella project (Breuker et al. 2006) where the Legal Knowledge Interchange Format (LKIF) core ontology is built to describe basic legal concepts; aiming at supporting the translation, alignment and harmonization between national jurisdictions of European countries. The Access-eGov (Hreno et al. 2011) project uses a set of ontologies to model the e-services integration process. Semantic interoperability solutions for local governments are proposed in the TerreGov (Barthes and Moulin 2005) project with a set of ontologies; these ontologies are used to describe services and documents, and enable the semantic Web services orchestration and discovery processes.

The above works show that a number of ontologies have been used for semantic eGovernment development around the world. Appropriate criteria need to be defined and applied to select those of these ontologies that best conceptualize and describe the eGovernment domain; this will promote the reuse of these generic top level eGovernment domain ontologies and strengthen consistency in the development of semantic eGovernment portals. This study investigates existing eGovernment domain ontologies and applies a set of predefined criteria to select the best suited set of ontologies for the eGovernment domain. Firstly, a literature review is carried out to identify existing eGovernment domain ontologies. Secondly, the identified ontologies are analyzed and classified based on their area of application in the eGovernment domain. Thirdly, various metrics including semantic coverage, open availability, codification language, and modularity are applied to evaluate and select the best set of top level ontologies for the eGovernment domain. The selected ontologies provide the best sharable and reusable conceptual representation and description of the public administration domain, as well as the electronic services delivery processes; thus, they could be used as generic top level ontologies for the eGovernment domain. The main contribution of the study is the investigation and selection of generic top level ontologies for the eGovernment domain; this might (1) promote the reuse of existing generic top level eGovernment domain ontologies, (2) save the time and cost needed for building new ontologies in eGovernment projects, (3) prevent inconsistency and confusion due to multiple semantic representations of the same eGovernment domain knowledge in the semantic eGovernment development community and (4) represent the starting point for the adoption of standard ontologies for the eGovernment domain.

The rest of the paper is organized as follows. Section 2 presents and applies the methodology of the study. A discussion is carried out in section 3 and a conclusion ends the paper.

2. Methodology

Figure 1 depicts the flowchart of the methodology of this study. Firstly, data is collected using a literature review. Thereafter, the collected data is analysed and candidate top level eGovernment domain ontologies are identified. Secondly, criteria based on the application domains of semantic technologies in eGovernment are defined and used to categorize the identified candidate ontologies. Finally, predefined selection criteria are applied to select the suitable set of generic top level ontologies for the eGovernment domain. The following subsections explain each phase of the methodology in detail.

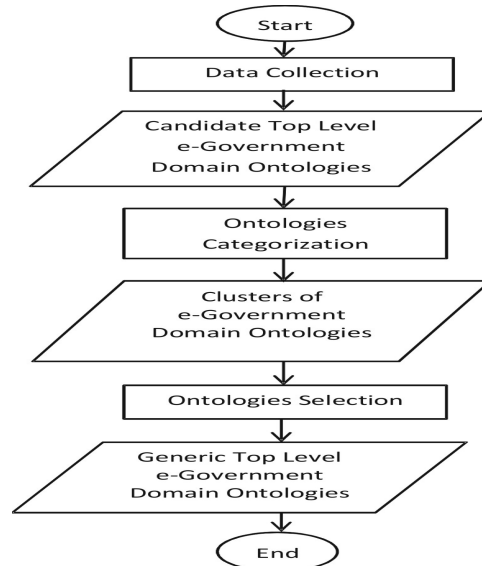


Figure 1: Flowchart of the generic top level eGovernment domain ontologies selection process

2.1 Data collection

Firstly, an intensive literature review is carried out based on keyword search in Google search engine; the keywords employed were "eGovernment ontology" and "semantic eGovernment". From the search result, we exploited the deliverable reports of various eGovernment projects, mainly European based projects, to discover more related projects. Thereafter, we grouped all papers and reports published under the same study or projects; this gives us a final list of 17 semantic-based eGovernment projects and 9 academic research studies. Finally, the research works and project reports downloaded were scrutinized to identify those which have employed ontology to address a particular aspect of eGovernment services delivery; then, the identified ontologies were recorded along with their authors, date of publication and where applicable, the project in which they were developed. Out of the 17 semantic-based projects initially identified, we remained with 11 projects (see Section 1); the related published papers and reports provided enough evidence (conceptual part of domain ontology, informal description of domain ontology, and/or sample code of an ontology) of ontology development in these projects. This preliminary information gives us the list of candidate top level eGovernment domain ontologies. The clustering of these candidate ontologies based on their application domain in eGovernment is presented in the next subsection.

2.2 Ontology categorization

After identifying the candidate top level eGovernment ontologies, we performed a thorough analysis of the corresponding researches and projects in which they were developed. The purpose of the analysis was to identify the application domain(s) that each identified candidate ontology falls in, within the eGovernment domain. We were helped in this phase by our previous work in Fonou-Dombau and Huisman (2011), where we have already partially identified and categorized an important number of the candidate ontologies; the work of Fittler et al. (2008) has also helped at this stage. In fact, Fittler et al. (2008) have investigated the research fields and application areas of ontologies in general and come up with three application areas of ontologies in the eGovernment

domain namely Process Modelling, Interoperability and Services Provision. With this result and the categorization of eGovernment domain ontologies previously established in Fonou-Dombau and Huisman (2011) we end up with four main application domains of eGovernment domain ontologies, namely Interoperability, Services Integration, Process Modelling and Services Provision. Table 1, Table 2, Table 3 and Table 4 show the result of the clustering of the candidate ontologies in the four semantic eGovernment application domains. Various criteria are defined and applied in the next subsection to select the best suite set of generic top level ontologies for the eGovernment domain.

Table 1: eGovernment interoperability domain and corresponding ontologies solutions

Interoperability		
Ontology	Authors	Projects
Government ontology	Jarrar et al. (2011)	Zinnar
5 kinds of ontologies	Gugliotta et al. (2005)	Academic research work
3 kinds of ontologies	Sabucedo and Rifon (2006)	Academic research work
eGovernment business ontology	Xiao et al. (2007)	Academic research work
Life-event and document ontologies	Sabucedo et al. (2010)	Academic research work
FEA-RMO	Hodgson and Allemang (2005)	OSERA
LKIF-core ontology	Breuker et al. (2006)	Estrella
Services and documents ontologies	Barthes and Moulin (2005)	TerreGov

Table 2: eGovernment services integration domain and corresponding ontologies solutions

Services Integration		
Ontology	Authors	Projects
Life-event ontology	Sanati and Lu (2009)	Academic research work
3 kinds of ontologies	Chen et al. (2008)	Academic research work
5 kinds of ontologies	Gugliotta et al. (2005)	Academic research work
3 kinds of ontologies	Hreno et al. (2011)	Access-eGov
Life-event ontology	Todorovski et al. (2006)	OneStopGov

Table 3: eGovernment process modelling domain and corresponding ontologies solutions

Process Modelling		
Ontology	Authors	Projects
Government ontology	Jarrar et al. (2011)	Zinnar
8 kinds of ontologies	Apostolou et al. (2005a, 2005b)	OntoGov
Process document ontology	Puustjarvi (2006)	Academic research work
SAKE ontology	Butka et al. (2006)	SAKE

Table 4: eGovernment service provision domain and corresponding ontologies solutions

Services provision		
Ontology	Authors	Projects
Life-event ontology	Todorovski et al. (2006)	OneStopGov
11 kinds of ontologies	Ortiz-Rodriguez and Villazon-Terrazas (2006)	Reimdoc
GEA ontology	Goudos et al. (2007)	SemanticGov
eGovernment services ontology	Fraser et al. (2003)	SmartGov

2.3 Ontology selection

At this stage, we investigated four characteristics, namely codification language, semantic coverage, modularity and content availability (Fitterer et al. 2008; Esposito et al. 2011). These characteristics are defined below.

- **Codification Language:** This characteristic refers to the language employed for the formal representation of the ontology. In fact, we are expecting the codification language of a selected ontology to be one of the standard ontology languages for the Semantic Web, such as Resource Description Framework (RDF) or Web Ontology Language (OWL).
- **Semantic Coverage:** The value of this characteristic is low, medium or high, thereby indicating the level of semantic richness of the ontology; the semantic richness is assessed based on the ontology features such as the number of concepts, supsumption (is.a), meronymy (part-of), etc.;

in brief, a selected ontology should not be built as a simple taxonomy, it must further be formed of rich semantic features.

- **Modularity:** This characteristic tells whether the ontology is formed of a single or many components. An ontology with several modules enables: (1) easy reuse of smaller parts, (2) distributed and collaborative development, (3) smooth and efficient evolution, and (4) easy replacement of parts of the ontology (Jarrar et al. 2011, p. 74).
- **Open availability:** Here, it is shown whether the ontology is publicly available or not. The accessibility of the selected ontologies to the public is of prime importance as the mayor aim of the study is to foster the reuse of these ontologies in semantic-driven eGovernment projects around the world.

Thereafter, a thorough analysis of the researches and projects reports, as well as projects websites was carried out; then, the above characteristics were applied to select the suitable set of top level ontologies for the eGovernment domain. Table 5 presents the set of ontologies that have been selected based on the abovementioned criteria to serve as generic top level ontologies for the eGovernment domain. An analysis of the candidate ontologies, as well as a brief presentation of the selected generic top level ontologies (depicted in Table 5), is carried out in the next section.

Table 5: Selected top level eGovernment domain ontologies and corresponding characteristics

Ontology	Codification Language	Semantic Coverage	Modularity	Open availability
FEA-RMO	OWL	High	5 domain ontologies	Publicly available (Allemang et al. 2004)
Government ontology	Not publicly available	High	15 domain ontologies	Publicly available (Jarrar et al. 2008)
LKIF-core ontology	OWL	High	15 modules / domain ontologies	Publicly available (Breuker et al. 2006)
Life-event ontology	OWL	High	1 generic model	Publicly available (Torodovski et al. 2007)
SAKE ontology	OWL	High	3 modules	Publicly available (Butka et al. 2006)
GEA ontology	OWL	High	1 generic model	Sample publicly available (Goudos et al. 2006, 2007)

3. Discussion

The study has investigated and identified several candidate top level ontologies for the eGovernment domain. These ontologies provide semantic-based solutions within various application domains of semantic technologies in eGovernment (i.e., Interoperability, Services Integration, Process Modelling and Services Provision). The chart of the clustering of candidate top level eGovernment domain ontologies with the semantic eGovernment application domains is depicted in Figure 2. This chart was drawn from the data provided in Table 1, Table 2, Table 3 and Table 4.

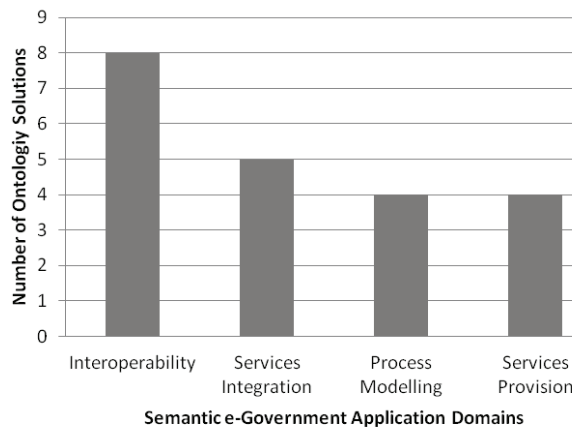


Figure 2: Chart of the clustering of candidate top level eGovernment domain ontologies with the semantic eGovernment application domains

Figure 2 shows that most of the candidate top level ontologies (40%) identified in this study were built to address the interoperability problem in eGovernment; similarly, 20% of the candidate ontologies are

equally used for process modelling and services provision in eGovernment, whereas, 25% of the candidate ontologies are being used for services integration. This indicates that semantic development is significantly broad in the field of eGovernment. Then, there is a need to foster eGovernment domain ontologies reuse across various projects to: (1) prevent inconsistency, (2) save the cost and time needed to build new ontologies in projects and (3) prevent the multiple semantic representation of the same eGovernment domain knowledge.

In Figure 3 it is shown that the final set of generic top level eGovernment domain ontologies in Table 5 cover all the semantic eGovernment application domains. This is an interesting finding of this study as the selected top level ontologies would provide a complete set of semantic ontology models for building semantic-driven eGovernment systems that broadly address the needs of governments and citizens.

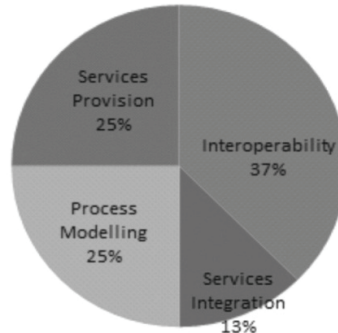


Figure 3: Chart of number of top level eGovernment domain ontologies per application domain

Precisely, the LKIF-core ontology (Breuker et al. 2006) describe the law and regulations that government the public administration domain through basic legal concepts; it is formed of 150 concepts and built with intensive semantic features (hyponymy, supsumption, etc.).

The government ontology (Jarrar et al. 2008) is composed of 15 modules describing public administration entities such as address, bank, local government unit, natural and non-natural person, company, Partnership Company, shareholder company, driving licence, etc.; these set of ontologies model processes and enable systems interoperability in eGovernment.

The FEA-RMO (Allemang et al. 2004) ontology is a set of 5 modules namely Performance, Business, Services, Technology and Data reference models ontologies; these ontologies were developed to enable the interoperability of the US government's federal agencies; they basically provide common reference models for modelling federal agencies' business processes, thereby, supporting their interoperability.

The SAKE ontology (Butka et al. 2006) is formed of 3 modules including: process and profile, information, and decision making quality ontologies; these ontologies were developed as support to an agile knowledge management system for eGovernment. In particular, the process and profile ontology models the business process and related activities that might involve a public administration user; it is formed of 47 concepts including input, output, date, creation-date, last-modification-date, process-model, and so forth and fully represented in an is-a hierarchy. The information ontology describes metadata such as subject, description, title, creator, publisher, format, location, and the like; overall, it contents 33 concepts describing storable information; these concepts were designed after a meticulous analysis of existing metadata standards and their harmonization. The decision making quality ontology models concepts that might be used as performance evaluation parameters of a process in a public administration organization; these concepts are in total 33 and include: metric, accountability, cost, quality, and many more.

The GEA ontology (Goudos et al. 2006, 2007) is a single abstract model that describes the public administration semantic as well as the overall eGovernment domain; it includes concepts such as governance-entity, political-entity, admin-level, service-provider, public-administration-service, law, outcome, and so forth. It is also used to enable the automatically mapping of citizens' needs to suitable public services. The life-event-ontology (Torodovski et al. 2007) is a single generic ontology model as well; it models the public administration services with 18 concepts related to life-events (e.g., get married, change address) of citizens with the public administration systems; these concepts

include: public-service, input, output, profile, document, citizen, family-status, education-level, job-category, gender, and the like.

Finally, it is worth highlighting that the final set of ontologies selected as generic top level ontologies for the eGovernment domain in Table 5, were developed within real world eGovernment projects in the United States (Allemang et al. 2004), European Countries (Breuker et al. 2006; Butka et al. 2006; Goudos et al. 2006, 2007; Torodovski et al. 2007) and Palestine (Jarrar et al. 2008). This indicates that these ontologies have been well thought of, consistently designed and published. However, there is a problem with the continuous availability of these ontologies to the public. In fact, these ontologies are mainly accessible through projects websites. In some cases, these websites might be closed after the completion of the projects, therefore, there is no guarantee that these websites will be maintained within a long period of time after the completion of projects (Fittler et al. 2008). One feasible solution to this problem might be to encourage the authors of these ontologies to provide complete information regarding their design, pilot implementations and deployments, including complete programming codes in books and CD formats, thereby enabling permanent access to them by eGovernment projects teams around the world. In fact, it is likely that interested governments would acquire such books for their semantic-driven eGovernment projects. Furthermore, authors of these ontologies should avail themselves for consultancy in training local personnel and support interested governments in implementing and deploying these technologies.

4. Conclusion

The study has investigated and applied a set of predefined criteria to select an ensemble of 6 generic top level ontologies for the eGovernment domain, developed in US, European countries and Palestine. The ontologies broadly provide semantic description and specification of the public administration domain, as well as the e-services integration and delivery processes. Furthermore, they may be used as standard ontologies for the eGovernment domain, thereby promoting the reuse of these ontologies in various eGovernment projects around the world, reducing the cost and time needed to build new ontologies, as well as strengthening consistency and collaboration in the semantic eGovernment development community.

The problem of continuous online availability of the ontologies selected in this study remains, as some projects websites might be closed after the full completion of projects, rendering the ontologies inaccessible. To address this problem we suggest that authors of the selected ontologies be encouraged to write books accompanied by CDs that provide in great details, information regarding the design, pilot implementations and deployment of these ontologies, thereby enabling permanent access to them through accredited publishers.

References

- Apostolou, D. Stojanovic, L. Lobo, T.P., Miro, J.C. and Papadakis, A. (2005) Configuring EGovernment Services Using Ontologies, IFIP International Federation for Information Processing, Springer Boston, Vol. 189, pp. 1571-5736.
- Apostolou, D. Stojanovic, L., Lobo, T.P and Thoensen, B. (2005) Towards a Semantically-Driven Software Engineering Environment for EGovernment, IFIP International Federation for Information Processing, M. Bohlen (Eds), TCGOV 2005, Vol. 3416, pp. 157-168.
- Allemang, D., Hodgson, R. and Polikoff, I. (2005) Federal Reference Model Ontologies (FEA-RMO), White Paper, Available: <http://www.topquadrant.com> (Last access 12/12/2011).
- Baldoni, R., Fuligni, S., Mecella, M. and Tortorelli, F. (2007) The Italian eGovernment Service Oriented Architecture - Strategic Vision and Technical Solutions, In Proceedings of the 6th EGOV Conference, Regensburg, Germany, 3-7 September, pp. 79-88.
- Barthes, J.P. and Moulin, C. (2005) Impact of eGovernment on Territorial Government Services, Deliverable No. 1.4, Available: <http://www.terregov.eupm.net>, (Last Access 06/12/2011)
- Breuker, J., Hoekstra, R., Boer, A., Van der berg, K., Sartor, G., Rubino, R. Wyner, A., Bench-Capon, T. and Palmirani, M. (2006) OWL Ontology of Basis Legal Concepts (LKIF-Core), Deliverable 1.4, Available: <http://www.estrellaproject.org/doc/D1.4-OWL-Ontology-of-Basic-Legal-Concepts.pdf>, (Last Access 12/12/2011).
- Butka, P., Gabor, A., Ko, A., Mach, M., Ntioudis, S., Papadakis, A., Stojanovic, N., Vas, R. and Zelinsky, T. (2006) Semantic-enable, Agile, Knowledge-based eGovernment (SAKE), Deliverable No. 3, Available: www.sake-project.org/fileadmin/filemounts/sake/DeliverableD6b.pdf, (Last Access 13/12/2011)
- Chen, D. Nie, G. and Liu, P. (2008) Research Knowledge Sharing of EGovernment Based on Automatic Ontology Mapping, In Proceedings of the 6th Wuhan International Conference on E- Business, China, pp.105-111.
- Esposito, A. Zappatore, M. and Terricone, L. (2011) Evaluating Scientific Domain Ontologies for the Electronic Knowledge Domain: A General Methodology, International Journal of Web & Semantic Technology, Vol. 2, No. 3, pp. 1-18.

- Fitterer, R., Greiner, U. and Stroh, F. (2008) Towards Facilitated Reuse of Ontology Results from European Research Projects – A Case Study, In Proceedings of the 16th European Conference on Information Systems (ECIS), Galway, Ireland, 1 July, pp. 1929-1940.
- Fonou-Dombau, J.V. and Huisman, M. (2011) Semantic-Driven eGovernment: Correlating Development Phases with Semantic eGovernment Specific Ontology Models, In Proceedings of the 11th European Conference on eGovernment, Ljubljana, Slovenia, 16-17 June, pp. 245-253.
- Fraser, J., Adams, N., McKay-Hubbard, A., Macintosh, A. and Canadas, R. (2003) A Framework for eGovernment Services, Deliverable No. 71, Available: <http://smartgov.e-gov.gr/index.php?category=results>, (Last Access 14/12/2011)
- Goudos, S.K., Peristeras, V. and Tarabanis, K. (2006) Mapping Citizen Profiles to Public Administration Services Using Ontology Implementations of the Governance Enterprise Architecture (GEA) models, In Proceedings of the 3rd Annual European Semantic Web Conference, Budva, Montenegro, 11-14 June, pp. 25-37.
- Goudos, S.K., Peristeras, V., Lutas, N. and Tarabanis, K. (2007) A Public Administration Domain Ontology for Semantic Discovery of eGovernment Services, In Proceedings of the 2nd IEEE Conference on Digital Information Management 2007 (ICDIM 2007), Lyon, France, 11-13 December, pp. 260-265.
- Gugliotta, A., Cabral, L., Domingue, J. and Roberto, V. (2005) A Conceptual Model for Semantically-Based EGovernment Portal, In Proceedings of the International Conference on eGovernment 2005 (ICEG 2005), Ottawa, Canada, 2005.
- Jarrar, M. (2005) Towards Methodological Principles for Ontology Engineering, PhD Thesis, Vrije Universiteit Brussel, Belgium.
- Jarrar, M., Deik, A. and Farraj, B. (2011) Ontology-Based Data Process Governance Framework – The Case of eGovernment Interoperability in Palestine, In Pre-proceedings of the IFIP International Symposium on Data-Driven Process Discovery and Analysis (SIMPDA'11), Campione, Italy, 30 June, pp. 83-98.
- Luts, M. (2004) Estonian Semantic Interoperability Initiative, SEMIC.EU publications.
- Ortiz-Rodriguez, F. and Villazon-Terrazas, B. (2006) EGO Ontology Model: Law and Regulation Approach for EGovernment, In Proceedings of the Workshop on Semantic Web for EGovernment 2006, Workshop at the 3rd European Semantic Web Conference, Budva, Serbia and Montenegro, 12 June, pp. 13-23.
- Puustjarvi, J. (2006) Using Knowledge Management and Business Process in EGovernment, In Proceedings of the Information Integration and Web-based Applications and Services 2006 (iiWas2006) Conference, Yogyakarta Indonesia, 4 - 6 December, pp. 331-339.
- Sabucedo, L.A. and Rifon, L.A. (2006) Semantic Service Oriented Architectures for EGovernment Platforms, American Association for Artificial Intelligence.
- Sabucedo, L.M.A., Rifon, L.E.A., Corradini, F., Polzonetti, A. and Re, B. (2010) Knowledge-based Platform for EGovernment Agents: A Web-based Solution Using Semantic Technologies, Journal of Expert Systems with Applications, Elsevier Inc., Vol. 37, No. 5, pp. 3647-3656.
- Sanati, F. and Lu, J. (2009) Multilevel Life-event Abstraction Framework for EGovernment Service Integration, In Proceedings of the 9th European Conference on EGovernment 2009 (ECEG 2009), London, UK, 29-30 June, pp. 550-558.
- Torodovski, L., Kunstelj, M., Cukjati, D., Vintar, M., Trochidis, I. and Tambouris, E. (2007) OneStopGove: D13 – Life-event Reference Models, Deliverable No. 13, Available: <http://islab.uom.gr/onestopgov/index.php?name=Deliverables>, (Last Access 13/12/2011)
- Xiao, Y., Xioa, M. and Zhao, H. (2007) An Ontology for EGovernment Knowledge Modelling and Interoperability, In Proceedings of IEEE International Conference on Wireless Communications, Networking and Mobile Computing (WiCOM 2007), Shanghai, 21-25 September, pp. 3600-3603.

Local eGovernment in the City of Casey: Political Barriers to Citizen Engagement

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Abstract: This paper outlines the impact of political contests and negotiations on the development and implementation of participatory eGovernment practices at the local level. Drawing from a grounded research approach, this paper discusses findings from an Australian local government case study – the City of Casey (Casey). Like many Australian local governments, Casey's online practices are predominantly limited to one-way information dissemination through its website (www.casey.vic.gov.au). While the council has attempted to provide new methods for citizen engagement online, these offer only limited and largely tokenistic means of participation rather than spaces for discourse and deliberation. Insufficient policy documentation currently guides Casey's online initiatives and shapes councillor decisions regarding eGovernment development. In-depth interviews with Casey Councillors suggest that the actions and motives of political representatives also restrict the incorporation of participatory elements into the council's online practices, as well as the use of citizen participation (on and offline) in decision-making. Political affiliations and divisions, and councillors' divergent understandings of information and communication technologies (ICTs) and the role of citizens in the democratic process, inform a reluctance to cede control of communication online. The interactivity and transparency associated with participatory eGovernment are perceived by Casey Councillors as risks that will require greater accountability of political performances or potentially jeopardise councillors' political futures. These broader political contexts of the City of Casey and its councillors currently undermine the council's policy processes and impede eGovernment development. This paper suggests that participatory eGovernment within Casey requires supplementary education amongst policy-makers on ICTs, the value of civic involvement, the potential benefits and risks associated with ICT-enabled citizen participation, and the importance of eGovernment policy documentation. Such strategies are needed if Casey's eGovernment is to progress to facilitate civic engagement.

Keywords: local eGovernment, citizen participation, engagement, policy

1. Introduction

Citizen participation in local decision-making offers constituents a chance to connect with their closest democratic representatives (Pratchett 1999) and contribute views to issues of direct relevance, immediacy and familiarity to citizens' lives. Networked technologies provide governments with the framework to develop spaces for such involvement through, for example, discussion boards, chat facilities or wikis. Opportunities for government-led online citizen participation are, however, ultimately reliant upon policy-makers taking advantage of new technologies. While local governments occupy a prime position to implement these practices, particularly for reasons of scale and management of online deliberation in comparison to other levels of government, many challenges to eGovernment implementation exist within local authorities.

This paper details the results of an empirical investigation into an Australian local government's use of the Internet for citizen participation. At present, Australian local eGovernment initiatives are largely one-way service delivery driven as these applications offer the greatest economic rewards for councils. Drawing from council documentation and in-depth interviews with local representatives from the City of Casey (Casey), this paper suggests that information and communication technology (ICT) take-up for two-way citizen participation is hindered by several factors. These include insufficient and ineffective policy guidance, and the political machinations and knowledge of local councillors. Combined with councillors' aims of maintaining political viability for re-election, these factors restrict possibilities for increased online transparency of government operations, opportunities for civic involvement, and use of citizen contributions in decision-making.

2. The City of Casey

The City of Casey local government was proclaimed in 1994 after the restructuring of local authorities throughout the state of Victoria, Australia. Forced amalgamations dramatically reduced the number of councils in the state from 210 to 79 (Hearfield and Dollery 2009). Under the reforms, the State Government was granted additional control over local government administration and finances. The new local governments operated more as corporate entities with larger budgets and a focus on service delivery, predominantly addressing citizens as customers (see Williamson 2002; Dollery, Byrnes and Crase 2008).

The City of Casey now covers approximately 400 square kilometres to the south-east of metropolitan Melbourne. Casey includes urban, rural, industrial and coastal areas and has 256,000 residents, making its population the seventh largest of Australian local governments (Australian Bureau of Statistics (ABS) 2010b). Casey has eleven councillors, equating to one councillor for approximately every 23,273 residents. Prior to the amalgamation, the local government areas now covered by Casey had an average of one local government representative for every 6,580 citizens.

Casey's area has been extensively developed over the past fifteen years, and Melbourne's urban growth zone now incorporates more than half of the municipality. Corresponding population growth places Casey's forecast at 403,000 residents by 2031 (City of Casey 2010). Overall, Casey's population is quite young in comparison to other areas of Australia, suggesting that local citizens are likely to be familiar with new technologies and possess the capabilities to use them (see Montgomery and Gottlieb-Robles 2006). 89 percent of Casey's residents are under the age of 60, and 29 percent are under eighteen years of age. Throughout Australia, these figures are 81 percent and 23 percent, respectively (ABS 2010a).

Rapid growth and council structure changes undoubtedly impact upon Casey's policy processes, the engagement mechanisms the council employs, and the ability of councillors to effectively represent their constituents, particularly in terms of having sufficient time to accommodate citizen enquiries. ICTs offer local governments like Casey quicker forms of communication to help keep up with increased citizen demand. If employed effectively, ICTs facilitate both civic connection with representatives and improved council operations. However, as the local government reforms coincided with widespread implementation of ICTs in government operations, the new emphasis on council efficiency has arguably contributed to the service delivery focus of local eGovernment initiatives.

3. Methodology

The ideas outlined in this paper represent the primary case study findings of a PhD project. In order to accommodate the shorter length of a conference paper, the details presented here provide a necessarily brief account of the key factors impacting on eGovernment in the City of Casey. Following a grounded research methodology (Glaser and Strauss 1967), data was drawn from a variety of methods to aid broad understanding into local eGovernment. The data gathered was compared to the online practices offered by Casey, which were examined to establish the one-way or two-way nature of the initiatives employed for citizens. Statistical evidence of Casey's website usage was also provided by the local government.

Document analysis of Casey's policies and strategies was undertaken to illustrate the impact of official documents on council operations and the development and implementation of eGovernment practices (see Ritchie 2003; Esmark and Triantafillou 2007). To date, the City of Casey has no eGovernment policy that specifically governs its online content and applications or that guides future development. It was therefore necessary to more broadly look at Casey's policies and strategies to determine how they influence local eGovernment, if at all. Documents were selected for examination if they related to council operations, infrastructure development, government-citizen communications, ICT in general, or citizen participation. Documents within these themes were determined the most likely to impact eGovernment within the municipality, enabling explanation of existing practices and theorisation of potential improvements.

Semi-structured interviews were conducted with City of Casey Councillors during 2007 and 2008 to uncover councillors' understandings and experiences in relation to eGovernment practices (see Lindlof and Taylor 2002). Five of Casey's eleven councillors agreed to be interviewed. At the time of interviewing, each participant had at least three years experience on council, with two interviewees having served as representatives for more than a dozen years. Four of the five councillors had held the position of City of Casey Mayor, and each represented a different ward within the municipality. There was also at least one representative interviewed from each of the three political parties on council (Labor, Liberal and Independent). Whilst a small sample size, the experience and diversity of the interviewees allows for broad insight and understanding into the factors impacting on Casey's eGovernment. In accordance with ethical requirements, councillors cannot be identified by name so each has been assigned with a colour: Councillors Black, Blue, Red, White and Yellow.

4. eGovernment in the City of Casey

The City of Casey's website (www.casey.vic.gov.au) is the primary form of ICT-enabled communication employed by the local government. The breadth and depth of the information provided has resulted in continual increased usage of the site, with more than 736,000 visitors viewing over 2,891,000 pages in the 2008-2009 financial year alone (website statistics provided by the City of Casey 2009). By way of comparison, telephone calls received by the customer service centre have steadily declined, although to a lesser rate, with approximately 246,000 calls received in the same financial year (City of Casey 2009a).

Casey's website contains an abundance of information on the local area, businesses, upcoming events, local services, councillor contact details, council activities, and official documentation such as policies and budgets. A mobile version of the website has been in place since 2006. Prior to this time, the council provided a text only version (since 2001) to facilitate the needs of citizens with limited Internet access. Commonly accessed information such as building requirements, community centre details and public transport availability is offered in five languages other than English to cater for Casey's multicultural community. The website also allows for credit card transactions for paying rates and infringement notices, and contains online petitions on roadwork issues. The petitions, however, only enable citizens to register their details in favour of the issue at hand – aligned with the council's view – meaning this type of application has little value in measuring local public opinion (Freeman and Hutchins 2009). Overall, the council's website privileges one-way information dissemination and service delivery functions, overlooking the value of two-way participation practices and opportunities for dialogue between local citizens and their government.

Casey has begun to use Twitter and Facebook to more actively engage citizens (with 2,693 Twitter followers and 780 people liking Casey's Facebook page, as of January 2012), and has placed promotional videos on YouTube. At present, Casey's Twitter and Facebook sites are predominantly used to post the headlines of council media releases, with links to full reports on the council's website. Whilst increasing information dissemination, the interactive potential for sharing and collaboration enabled by these social media sites is largely ignored.

In 2008, the council launched a civic networking website called 'Casey Connect' (www.caseyconnect.net.au). Casey Connect allows local clubs, groups or associations that register to develop a webpage on the free government-run website to recruit new members (City of Casey 2008). These pages can be hyperlinked to existing websites to provide additional information. Casey Connect received 8,098 visitors for the 2008-2009 financial year, an increase of 192 percent from the previous year (City of Casey 2009a). As of January 2012, there are approximately 150 local community groups registered through the site. However, two-way communication through Casey Connect is limited. Some of the more interactive features of the site include downloading enrolment forms for community centre courses and hyperlinks to the email addresses for clubs and organisations. While groups can advertise their activities through Casey Connect, there are no discussion boards or chat facilities employed to assist with greater civic networking. Moreover, Casey Connect does not specifically facilitate citizen interaction with the local government itself.

The City of Casey is beginning to take innovative steps towards participatory eGovernment. In late 2010, the council launched a 'Casey Conversations' website (caseyconversations.com.au), which offers online discussion boards for civic consultation on key advocacy issues. The forum allows citizens to post comments and agree or disagree with other comments. While this site is a promising eGovernment development, it is restricted in its present state. The website does not utilise a government domain (similar to Casey Connect), meaning discussions may not inform policy-making. There is no indication that representatives read citizens' comments or engage with the website. Casey has outsourced the development, maintenance and moderation of Casey Conversations rather than incorporating it into the local government's everyday practices. Dialogue is inhibited because citizens must register to use the website and cannot add discussion topics. Importantly, the discussion topics available concern issues where the final responsibility rests with State or Federal Government, rather than Casey. It is commendable that Casey wishes to gauge citizens' views on advocacy issues, but the importance of allowing civic participation to inform local decision-making appears to have been overlooked. These observations suggest that Casey Conversations may be a tokenistic attempt to engage citizens in decision-making.

5. Limitations to Casey's eGovernment development

The City of Casey has demonstrated a reluctance to implement participatory online practices that might influence the council's decision-making processes. Like governments throughout the world, Casey faces limitations to eGovernment advancement such as access to broadband infrastructure, socio-economic divisions and citizens' varying skill levels. Rather than focus on these widely examined issues, this section details the influence of policy processes and the extent that local councillors' broader political backgrounds impact on Casey's eGovernment.

5.1 Local eGovernment policy frameworks

Effective eGovernment requires policy frameworks that address ICT infrastructure access, citizen development of ICT skills, and the provision of relevant content and spaces for citizen participation and engagement (Freeman 2011). Like many Australian local governments, the City of Casey does not have a formal policy that guides its eGovernment development or the content and applications offered on the council's website. No councillor interviewed was aware of this fact. ICT use in the municipality is influenced more broadly by Casey's policies and strategies. An example of this influence is the provision of public access terminals and training workshops in local libraries. These documents do not, however, directly address citizen participation online. For example, while the council's *Communications Policy* (2009b) recognises that two-way communication is necessary to build positive community partnerships, and to promote transparency and accountability in decision-making processes, the entire of the 'City of Casey Website' section in the policy states: "Council's website is to carry the City of Casey logo and disclaimer on each page" (City of Casey 2009b: 5). This observation indicates a lack of understanding towards ICTs and how they may be employed for reciprocal practices. Further policy guidance is needed if online communications are to be utilised by Casey to enhance citizen engagement, increase transparency of information, and facilitate greater accountability of government operations.

In October 2009, the council considered a ten-page report produced by Casey's communications department on the potential use of social media for two-way communication with citizens (City of Casey 2009c). Internal and external stakeholders were consulted when developing the report, including the council's IT department, risk management section, independent legal advice, insurance advice, and other Victorian local governments. The report details threats of viruses, fraud, security requirements, identity theft, defamation, copyright and privacy issues. This indicates that Casey has considered the costs and risks associated with implementing two-way online practices. Based on the report's recommendations, the council's social media use will remain "locked down", giving the council the capacity to review and approve content restricted to one-way practices. In this way, the council intends to prevent IT risks, potential liability issues and damage to Casey's image and public profile (City of Casey 2009c). Notably, "[t]he key concern for Council when using social networking sites is the ability to *control* information that is placed on these sites" (City of Casey 2009c: 64, emphasis added). When decisions regarding eGovernment are based on reports that fail to suggest any potential benefits of ICT-enabled communication with citizens, implementing two-way online practices would be a daunting thought for representatives. It comes as little surprise then that the council's use of social media remains restricted.

Similar to social media use, motions to webcast council meetings have not been successful, largely due to councillor concerns surrounding mediated visibility (Thompson 2005) and potential legal ramifications (Councillor White). Three of the councillors interviewed were strongly in favour of webcasting meetings. While the official reasons behind the failed motions were cost and potential legal issues, Councillor Red stated that, "Several councillors wouldn't want to have been put under the pump of having their actions broadcast... I think for certain councillors, fear of being recorded would've been too much". Full deliberations are visible through webcasts, rather than just having final outcomes noted in the minutes of meetings. The concern for councillors is that mediated visibility can be deployed as a political weapon against them by opponents, threatening their political viability. To this end, transgressions of Casey Councillors were discussed by each interviewee. The most frequent topics mentioned were councillor misconduct during meetings, leaking of information to the local news media, disregard for council policies, and manipulation of the election process. The greater transparency of councillor actions and council operations through webcasting would increase both the projection of messages for Casey Councillors and the likely intensity of interaction with local news media. Councillors fear being exploited by other councillors as they cede control of the messages being sent to citizens. It would become harder to predict the possible consequences of such visibility,

which may create “politically explosive events” (Thompson 2005: 31). While webcasting enables wider dissemination of political information, and enhances the transparency of council operations (Councillor Red; Councillor Black), attempted deceit and manipulation of messages may increase the gap between citizens and representatives, which undermines the democratic process (Corner 2003). The concern for representatives likely lies in how well equipped they (and their opponents) are to take advantage of politics as a mediated space.

Councillor Blue highlighted the influence of councillor alliances, stating that, “After the election we might be able to do it [webcast], if we get a few more councillors in that are a bit more amenable to those sort of things”. He suggested that, “The current climate of division in the council probably didn’t help either. A lot of division” (Councillor Blue). Councillor Red reiterated concerns about alliances undermining the council’s policy processes:

There’s a political issue happening with this council at the moment – there’s a group of councillors that support one another, and then there is a few of us over here, and this group has got the numbers and they just keep knocking everything off.

(Councillor Red)

As each interview progressed, it became evident that councillor alliances are reinforcing the idea that many representatives are “more attached to their parties than those they represent” (Coleman and Blumler 2009: 76). Citizen involvement in government processes, the development of new practices, and long-term policy implementation are hindered by short-term politics and politicking. Of particular concern here is a possible mismatch between the decisions of the stronger council alliance and the best interests of the community. To this end, Councillor Red stated, “You’ve got certain councillors that are more interested in protecting the officers’ interests, rather than the residents who elect them”.

Even more concerning than insufficient policies and unpassable motions for participatory eGovernment development was the finding that current policies are often ineffective: “If you’ve got the numbers on the council, you can totally disregard that policy” (Councillor Red). Within Casey, councillor alliances not only determine which motions pass but also which policies are enforced, a finding that affects all areas of Casey’s development. The motives and actions of Casey’s policy actors are therefore key factors restricting participatory eGovernment development in the City of Casey. Councillor understandings of ICTs and citizen participation also influence eGovernment decisions.

5.2 ICT knowledge

The interviews revealed substantial variations in councillors’ knowledge about ICTs and their applications for both internal council operations and external communication with citizens. While divergent understandings were to be expected, the extreme of understandings was not anticipated. Councillors were aware of some of the potential benefits of new media technologies, such as increased information dissemination (Councillor Black; Councillor White; Councillor Red), time saving capabilities (Councillor Red; Councillor Blue), the use of polls to gauge public opinion prior to decision-making (Councillors Red; Councillor Blue), and that diversity of media formats offers citizens complementary and contrasting understandings of political issues (Councillor Red; Councillor Black; see Pusey 2003). Many factors that hinder ICT use for citizen participation were also recognised, including that elderly citizens are less likely to have sufficient skills to use new technologies (Councillor Yellow), computer literacy in general (Councillor Blue), access to infrastructure (Councillor Red; Councillor Yellow), and the need to foresee risks like privacy, security and online bullying (Councillor Red).

At the other end of the spectrum, there was confusion surrounding the technologies. Councillor Yellow initially did not recognise that email is made possible by the Internet: “I don’t get contacted by anyone via the Internet, unless... does emailing come under the Internet?” Councillor White did not understand the importance of citizens having a broadband connection:

I think broadband is available, but everyone keeps talking about broadband and whatever the other one is called, dial up... Depending on what you do, and what your needs are, I don’t know whether broadband is a must have. So if you’ve got one or the other, I don’t really think it matters if you’ve got the time to use it.

(Councillor White)

Here, Councillor White has not fully appreciated the importance of broadband Internet for social, cultural, political and economic activities (Hartley 2005), suggesting the need for greater digital literacy amongst representatives. He also was not aware that Casey's rapid development has resulted in an insufficient number of broadband exchange points to accommodate new users, which has created contention within the municipality that the council attempted to rectify.

In part, it is likely that this diversity in knowledge is the result of a disconnection between the council officers who are familiar with and continually research the issues at hand, and the councillors who make the final decisions regarding ICT use. The social media report outlined above provides evidence of this disconnection. While the report contained substantial information about the costs and risks of social media use, what is conspicuously missing is an explanation of the potential benefits of web 2.0 tools, such as the possibility for social collaboration. These benefits need to be conveyed to policy-makers so fully informed decisions can be made. Informed, educated leadership is needed under a representative form of government (Milner 1999). Without adequate education on these technologies and their applications, policy-maker decisions regarding eGovernment development are less likely to reflect the best interests of the community.

5.3 Views surrounding civic participation

Councillors' understandings surrounding the role of citizens in decision-making shape the participation practices employed and the influence citizen involvement has on councillor judgements. Interviewees viewed direct contact with councillors as both the primary form of citizen participation and the most likely method to influence decision-making, given a significant number of people contact their councillor with the same concern. Contact through face-to-face communication, telephone, letters or emails was seen to be more "genuine" (Councillor Yellow). Letters-to-the-editor in local newspapers are unlikely to influence councillors unless there was a continuing series on an issue (Councillor Blue; Councillor Yellow). Councillor Yellow suggested that petitions would gain more attention than letters-to-the-editor, but also indicated that they could be "dodgy" because "anyone will sign anything that is put in front of them". Citizen attendance at council meetings is seen as a "waste of time because... if they [citizens] were going to do any lobbying, they should lobby the councillor before the meeting" (Councillor White).

When citizen participation does take place, the councillors indicated that it is unlikely to influence the council's policy processes. In regards to a local road development issue, councillors recognised that it was "terribly controversial" (Councillor Black) for the community and resulted in citizens creating a local action group, an online petition, numerous letters-to-the-editor, and direct contact with councillors at purposely held public meetings. Despite the breadth and depth of civic involvement in this issue, the decision "never really got down to the citizens' influence" (Councillor Black; Councillor Red). Citizen participation is a core element of politics and helps to produce democratically legitimate decisions. But participation requires reciprocity and impartiality on the part of representatives for citizen involvement to be considered and inform the views and decisions of policy actors (Wiklund 2005). There is a need here to reassert to Casey's policy-makers the importance of civic contributions to the political process.

Councillor White emphasised that it is the representatives who make decisions on behalf of citizens:

Eleven people have been elected to make the decision. If you put it back to the web and everyone may put their hand up and make the decision, then why have eleven councillors? And the other thing also is the people who are going to respond to this question, how well informed are they? That would be the real issue... Unfortunately, I think most times people make an emotional decision about things without having the facts in front of them.

(Councillor White)

This comment suggests that local citizens are largely uninformed and too emotional to make rational decisions. Arguably, however, emotion can be viewed as a key factor encouraging citizen participation in political activities (Pantti and van Zoonen 2006). Moreover, a role of local government is to inform citizens on issues to enhance democratic consciousness (Pratchett 1999). In regards to keeping citizens informed, Councillor White stated that, "Citizens will be, when a decision has been made, citizens will be advised". This comment raises further questions about how citizens are meant to democratically contribute their opinion to debates if they are only informed about issues after the

council has made its final decision. ICTs offer new spaces for policy deliberation but, within Casey, it is questionable as to whether online public forums would have any more influence on the council's decision-making than other participation methods. Moreover, there is little point in establishing new methods of political participation if civic input has no impact on policy processes.

6. Political barriers to online engagement

These observations from the City of Casey suggest some key political barriers behind the development and implementation of local participatory eGovernment. Opening online communication channels with citizens can empower, undermine or reposition local representatives (see Laguerre 2005). The increased mediated visibility and reciprocity associated with online practices are perceived as threats, which can exacerbate already existing problems in political processes (see Wong and Welch 2004). For example, if little value is placed on citizen participation in decision-making through offline methods, employing two-way online communications that do not enable greater engagement may further frustrate disenfranchised citizens. Participatory eGovernment depends upon representatives relinquishing at least partial control of the information transmitted. But it is this control that politicians feel gives them power. For councillors, increasing online interaction and transparency creates additional pressure to demonstrate greater accountability and improve political and organisational performance (Eggers 2005). Establishing a more open government that facilitates online citizen participation in decision-making therefore necessitates a change in governmental culture.

To enhance accountability through participatory eGovernment, representatives must be responsive to citizens' preferences (Wong and Welch 2004). As long as Casey Councillors are unwilling to consider the views of the citizenry in decision-making, opportunities for online engagement are likely to remain restricted. Similarly, webcasting council meetings potentially brings adverse publicity for councillors, provides political opponents with greater research opportunities, and allows citizens and the news media to further scrutinise political processes. Increasing interactivity and transparency through participatory eGovernment therefore presents threats to councillors' electoral appeal and political viability (Eggers 2005). Processes of public connection through eGovernment are unlikely to be given a high priority amid representatives' aspirations for re-election and fears that online practices will jeopardise political futures. It is for this reason that decisions regarding eGovernment development in the City of Casey are so heavily influenced by strategic council alliances.

7. Conclusion

Opportunities for citizen participation are shaped by governments. EGovernment offers the tools to alter communications, but these tools alone cannot create transparent information or improve government-citizen interaction. It is the people and processes behind the use of these technologies that ultimately determine the openness of political communication and the value associated with citizen involvement. This paper highlights that, in Casey, eGovernment is shaped by the fear that increased interaction and transparency threaten careers by demanding greater accountability of councillors' political performances. While it is promising to see the City of Casey continue to develop its eGovernment practices and that some councillors are receptive to prospects of online participation, the initiatives offered reinforce existing organisational tendencies by prioritising service delivery over contexts for deliberation and debate. Those participatory practices that are available involve issues where the local government has no responsibility for final decisions. In these instances, citizen involvement is unlikely to reach or influence state and federal authorities, and there is no evidence to suggest that citizen contributions are informing local councillor opinions or actions. Representatives are meant to speak for their citizens, but this cannot be done effectively if councillors are resistant to citizens' opinions, which should be conveyed to representatives prior to decision-making. Moreover, citizen participation in Casey may be futile if it does not conform with the stronger council alliance or if political schisms override the inclusion of civic views on community issues. At this stage, then, it appears that any form of citizen participation is unlikely to impact Casey's policy processes.

The development and implementation of eGovernment policies and practices in the City of Casey are influenced by the attitudes, motives, actions and understandings of local policy-makers. Considerable energy is currently expended on internal conflicts that draw attention away from civic connection with representatives. Opportunities for eGovernment policy development and additional participation methods are reduced as eGovernment innovation becomes a divisive political issue that is difficult to resolve. Moreover, participatory eGovernment is unlikely to be a priority if councillors are unfamiliar with the practices enabled through advanced technologies and unwilling to consider local debate in

policy-making. If local eGovernment in the City of Casey is to advance to facilitate citizen participation, greater education is needed amongst policy-makers on ICTs, the importance of civic involvement in decision-making, and the need for and commitment to strong policy frameworks guiding online mechanisms. The findings outlined in this paper therefore suggest that advancing eGovernment in the City of Casey to facilitate increased civic engagement is as much about changing the culture of government as new technologies.

References

- Australian Bureau of Statistics (ABS) (2010a) *Australian Demographic Statistics, June 2010*, Cat. No. 3101.0, ABS, Canberra.
- Australian Bureau of Statistics (ABS) (2010b) *Regional Population Growth, Australia*, Cat. No. 3218.0, ABS, Canberra.
- Casey Connect (website) (2012) *Casey Connect: Connecting Communities Online*, City of Casey, Victoria, www.caseyconnect.net.au.
- Casey Conversations (website) (2012) *City of Casey: Casey Conversations*, Bang the Table Pty Ltd, Collingwood, Victoria, <http://caseyconversations.com.au>.
- City of Casey (2008) *Casey Connected by New Website*, Media Release, City of Casey, Victoria, 18 March, www.casey.vic.gov.au/mediareleases2008/article.asp?Item=12052.
- City of Casey (2009a) *Annual Report 2008-2009*, City of Casey, Victoria, www.casey.vic.gov.au/annualreport/article.asp?Item=16839.
- City of Casey (2009b) *Communications Policy*, Version 2.2, City of Casey, Victoria, www.casey.vic.gov.au/policiesstrategies/article.asp?Item=4095.
- City of Casey (2009c) *Council Meeting Agenda*, 20 October, City of Casey, Victoria, www.casey.vic.gov.au/meetings/article.asp?Item=14187.
- City of Casey (2010) *City of Casey Population and Household Forecasts*, ID Consulting Pty Ltd, Fitzroy, Victoria, <http://forecast2.id.com.au/templates/forecast2/Clients/109Case/PDF/10.pdf>.
- City of Casey (website) (2012) *City of Casey*, City of Casey, Victoria, www.casey.vic.gov.au.
- Coleman, S. and Blumler, J.G. (2009) *The Internet and Democratic Citizenship: Theory, Practice and Policy*, Cambridge University Press, New York.
- Corner, J. (2003) 'Mediated Persona and Political Culture', in Corner, J. and Pels, D. (eds) *Media and the Restyling of Politics: Consumerism, Celebrity and Cynicism*, Sage, London, pp. 67-84.
- Dollery, B., Byrnes, J. and Crase, L. (2008) 'Australian Local Government Amalgamation: A Conceptual Analysis Population Size and Scale Economies in Municipal Service Provision', *Australasian Journal of Regional Studies*, Vol. 14, No. 2, pp. 167-175.
- Eggers, W.D. (2005) *Government 2.0: Using Technology to Improve Education, Cut Red Tape, Reduce Gridlock, and Enhance Democracy*, Rowman & Littlefield Publishers, Inc., Maryland.
- Esmark, A. and Triantafillou, P. (2007) 'Document Analysis of Network Topography and Network Programmes', in Bogason, P. and Zølner, M. (eds) *Methods in Democratic Network Governance*, Palgrave Macmillan, Basingstoke, Hampshire, pp. 99-124.
- Freeman, J. (2011) 'Framing ICT Policies to Facilitate Participatory EGovernment', in Papandrea, F. and Armstrong, M. (eds) *Record of the Communications Policy and Research Forum*, Network Insight Institute, Sydney, pp. 180-193.
- Freeman, J. and Hutchins, B. (2009) 'Balancing the Digital Democratic Deficit? EGovernment', *Media International Australia*, No. 130, pp. 17-27.
- Glaser, B.G. and Strauss, A.L. (1967) *The Discovery of Grounded Theory: Strategies for Qualitative Research*, Aldine Publishing Company, Chicago.
- Hartley, J. (ed.) (2005) *Creative Industries*, Blackwell Publishing, Carlton, Victoria.
- Hearfield, C. and Dollery, B. (2009) 'Representative Democracy in Australian Local Government', *Commonwealth Journal of Local Governance*, Vol. 1, No. 2, pp. 61-75.
- Laguerre, M.S. (2005) *The Digital City: The American Metropolis and Information Technology*, Palgrave Macmillan, Hampshire.
- Lindlof, T.R. and Taylor, B.C. (2002) *Qualitative Communication Research Methods*, 2nd edn, Sage, Thousand Oaks, California.
- Milner, E. (1999) 'Electronic Government: More than Just a 'Good Thing'? A Question of 'ACCESS'', in Hague, B.N. and Loader, B.D. (eds) *Digital Democracy: Discourse and Decision Making in the Information Age*, Routledge, London, pp. 63-72.
- Montgomery, K. and Gottlieb-Robles, B. (2006) 'Youth as e-Citizens: The Internet's Contributions to Civic Engagement', in Buckingham, D. and Willett, R. (eds) *Digital Generations: Children, Young People, and New Media*, Lawrence Erlbaum Associates, Inc., Mahwah, New Jersey, pp. 131-147.
- Pantti, M. and van Zoonen, L. (2006) 'Do Crying Citizens Make Good Citizens?', *Social Semiotics*, Vol. 16, No. 2, pp. 205-224.
- Pratchett, L. (1999) 'New Technologies and the Modernization of Local Government: An Analysis of Biases and Constraints', *Public Administration*, Vol. 77, No. 4, pp. 731-750.
- Pusey, M. (2003) *The Experience of Middle Australia: The Dark Side of Economic Reform*, Cambridge University Press, Port Melbourne, Victoria.

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- Ritchie, J. (2003) 'The Applications of Qualitative Methods to Social Research', in Ritchie, J. and Lewis, J. (eds) *Qualitative Research Practice: A Guide for Social Science Students and Researchers*, Sage, London, pp. 24-46.
- Thompson, J.B. (2005) 'The New Visibility', *Theory, Culture & Society*, Vol. 22, No. 6, pp. 31-51.
- Wiklund, H. (2005) 'A Habermasian Analysis of the Deliberative Democratic Potential of ICT-Enabled Services in Swedish Municipalities', *New Media & Society*, Vol. 7, No. 5, pp. 701-723.
- Williamson, D. (2002) *What Price Citizenship? The Impact of the Kennett Government Reforms on Democracy, Citizenship and Local Governments*, Victorian Local Governance Association, Melbourne.
- Wong, W. and Welch, E. (2004) 'Does EGovernment Promote Accountability? A Comparative Analysis of Website Openness and Government Accountability', *Governance: An International Journal of Policy, Administration, and Institutions*, Vol. 17, No. 2, pp. 275-297.

Lost Youth? Attitudes Towards and Experiences With eGovernment: The Case of German University Students

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Abstract: eGovernment applications are on the move (Margetts 2008). The adaptation of e- government solutions, however, differs markedly between different nations (Kim 2007, Wohlers 2009) and groups with specific socio-economic characteristics (Pew 2010) and/or attitudes towards technology and government in general. A recurring argument in the general debate claims, however, that due to the fact that younger cohorts grow up with the Internet experience, they will be more willing as well as demanding with respect to the development of eGovernment solutions. In other words they will be more inclined to use eGovernment solutions (speeding up the use of existing solutions) and more demanding (speeding up the development of new solutions). Discussions in the discipline furthermore often refer to the variables “trust in technology” and/or “trust in government” (McNeal/Hale/Dotterweich 2008) to explain the differing attitudes towards eGovernment. The present paper is based on a survey done with students of a big university in the South West of Germany. The paper reveals what variables explain the up take respectively the widespread neglect of eGovernment applications. The development of eGovernment (Coursey/Norris 2008) might change the perception of government itself (Sweeney 2008) and lead to new expectations (Gauld/Gray/McComb 2009). But a simple, further increase in eGovernment solutions by itself will not lead to more trust in the public administration and more public participation.

Keywords: eGovernment, eGovernment adoption, eGovernment in Germany, trust in government, trust in technology

1. Introduction

eGovernment applications are on the move (Margetts 2008). The adaptation of e- government solutions, however, differs markedly between different nations (Kim 2007, Wohlers 2009) and groups with specific socio-economic characteristics (Pew 2010) and/or attitudes towards technology and government in general. A recurring argument in the general debate, however, claims that due to the fact that younger cohorts grow up with the Internet experience, they will be more willing as well as demanding with respect to the development of eGovernment solutions. In other words they will be more inclined to use eGovernment solutions (speeding up the use of existing solutions) and more demanding (speeding up the development of new solutions).

The present paper is based on a survey among German students on their use of eGovernment solutions. It draws furthermore on a series of in depth interviews with student users and IT developers in the public administration of the home city of the university (which is among the ten biggest cities in Germany). The paper reveals what variables explain the up take respectively the widespread neglect of eGovernment solutions. It also highlights the fragile and uncertain adoption of online engagement by public organizations. It seems obvious that a simple, further increase in eGovernment solutions by itself will not lead to more trust in the public administration or higher public participation rates.

2. State of the art

One of the pitfalls of publishing material on eGovernment is that often the fast pace of development means that the scenarios that you wrote about have changed by the time you come to publish them. A recent study on *studiVZ* – some years ago the number one social network in Germany – became only published once the network was on its way towards oblivion. The discussion on elections over the Internet flourished some ten years ago and now is nearly forgotten. Given the preoccupation of many governments in recent times with the global financial crisis and the urgent concern with budget issues, most western governments are in a period of retrenchment and consolidation rather than launching new innovative programs to radically reshape the many interfaces of government. Thus there might be a time of stock taking. Many expectations and the flurry of big initiatives to bring about eGovernment success have subsided and a calmer tone is prevailing.

As Henman (2010) rightly points out, discussing the relationship between government and technology is nothing new in itself. EGovernment did not arrive in a creationist big bang with the advent of the Internet, but rather has evolved through a series of development stages (see for Germany: Grimmer 2003), which have morphed into what we know as eGovernment today - a history and relationship

that features a lot of ups and downs, big expectations and smashed hopes. But this does not want to imply that eGovernment is a failure or will not continue to be further developed. On the contrary: there is a steady growth of eGovernment applications. Expectations from the general public require that the public administration tries to keep up with developments in the private sector (Bechmann/Beck 2003:5) – although the conditions and requirements in the two areas are quite different. The growing mood (at least in many parts of continental Europe) against new public management tools and the marketization of public administration symbolizes these differences.

One of the differences between e-commerce and eGovernment results from the different types of requirements involved in the contact between the public administration and the citizen. Citizens in most cases *have* to get into contact with the public administration (e.g. getting a passport) and there is no competitor which would offer the same services. The public administration furthermore is not a uniform organization like e.g. Apple. The scope of the public administration is broad and unlike companies, public administration does not have a uniform outlook, a single brand, but is subdivided among different territorial levels and a huge number of sometimes autonomous or semi-autonomous organizations.

The manifold character of eGovernment also creates problems for research. General data on the development of eGovernment in Germany are available, but due to the aforementioned fragmentation of the public administration they lack precision and pervasiveness. Empirical studies therefore usually concentrate on specific government applications offered by specific organizations or levels of government. Given the problems in defining the relevant unit of analysis, it is not surprising that empirical studies often provide contradictory results.

An additional problem is surely that the average number of contacts with the public administration is hard to measure, but is usually interpreted as being very limited. The political system of Germany - like that of the USA - has a federal structure, which leaves much discretion to the state and local levels. Citizens are not confronted with eGovernment as such but with applications that are offered by some elements of the federal administration (contacts which actually happen extremely seldom for an ordinary citizen), the state administration and/or the local level. Most contacts with the public administration take place at the local level, but there is no uniform German-wide regulation on what must or can be offered via the Internet or other platforms on this level.

The present paper does not aim to overcome these limitations. It is concerned with one question in particular: What influences the use of eGovernment applications? Are there specific attributes, which increase the readiness to use eGovernment and if so, what are they? We do not ask this question addressed to a representative sample of citizens in Germany. We rather opted for asking students of a major university in the south west of Germany and tried to involve some of the questioned students in more in depth questioning (focus groups) and presented the results to members of the IT department of the home city of the university, which are responsible for constructing and administering the web services of this local public administration.

3. Theories, data and methods

The methodological approach is thus threefold:

- On the one hand there is a standardized questionnaire.
- Secondly in depth expert interviews with responsible persons from the city administration were conducted and
- Focus group discussions with students of the University were organized.

The quantitative survey was done with students of a university. Participation was voluntary and done using an internal university platform. Thus no outside persons or non-students (since students have a special identity e-mail address, the use of which is required in order to get into the university system) could participate. The university platform makes it also possible to check that each person can do the survey only once. Specific questions on the socio-economic status of respondents were not included. Other research on the students of the university shows that they are a pretty much homogeneous group (with respect to education, age, income, parental background). All questioned people furthermore have to be familiar with basic elements of the Internet. Not only because they are using an online questionnaire but also because the university requires the use of the Internet for a variety of obligatory functions. That is: every student is used to search for information on the Internet, download

material, fill out applications and to make university related monetary transactions. We can thus suppose that the respondents possess Internet literacy.

The questions asked were aiming to solicit information about local government sites. The reasoning behind this was twofold: the local administration is - as mentioned before - the one layer of public administration with the most recurrent contacts and secondly elements in the process for registering with the university imply contact with the local administration of the students' home town that can either be done using the Internet or personally (or by regular mail). People who have grown up with digital media are often assumed to be universally savvy with the Internet and information and communication technologies in general. Such assumptions are rarely grounded in empirical evidence, however. Our paper draws on data with information about a group of young adults' Internet uses and skills to suggest that people differ in their online abilities and activities and that secondly the practical use (in spite of a theoretical interest) of eGovernment applications is very limited. This suggests that there is no automatism that brings the so called digital natives in contact with eGovernment and its theoretically considered benefits (e.g. more trust in government, more participation).

Finally the questionnaire used had to be short. The university network is increasingly used for all kinds of questioning with a resulting small return rate – that is especially true for long questionnaires.

In the quantitatively oriented literature on eGovernment different explanatory strategies are employed. A literature review showed that there is no consensus on what are the most important variables (e.g. Doll/Torkzadeh 1988, Sulat et al. 2002, Carter/Belanger 2005, Colesca 2009, McKnight et al. 2002). Based on the literature review seven hypotheses were developed and tested:

H1: Higher levels of a positive attitude towards the Internet will be positively related to higher levels of use of eGovernment applications.

H2: Higher levels of knowledge about existing eGovernment applications will be positively related to higher levels of use of eGovernment applications.

H3: Higher levels of appreciation of a web site will be positively related to higher levels of use of eGovernment applications.

H4: Higher levels of perceived availability of all important applications on the local e- government web site will be positively related to higher levels of use of eGovernment applications.

H5: Higher levels of approval to the statement that eGovernment applications should be exclusively available on the Internet will be positively related to higher levels of use of eGovernment applications.

H6: Higher levels of trust in the Internet will be positively related to higher levels of use of eGovernment applications.

H7: Higher levels of trust in the public administration will be positively related to higher levels of use of eGovernment applications.

The following design elements were used in questionnaire:

Table 1: Design elements used

	DIMENSIONS						
	Attitude Internet	Perception /Evaluation Supply	Evaluation Web Site	Important Services Available	Comprehensive and Exclusive Online	Trust Internet	Trust Public Administration
Five – Dimensional Rating Scale	X		X		x	X	X
Dichotomous Question		X		X			
Nominal		X		X			
Ordinal	X		X		x	X	X

After fixing missing values and eliminating non-response cases, 162 cases remained for analysis. Among the respondents female students are slightly over represented, which, however, is in line with overall student enrollment data.

Table 2: Gender distribution

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Female	87	53,7	53,7	53,7
Male	75	46,3	46,3	100,0
Total	162	100,0	100,0	

4. The survey

The questionnaire first asked for some general information: sex, length of study, study subject. It continued to assess the general attitude towards the Internet. Students had to tell, whether they have visited the website of their home town and those answering yes, were asked which specific applications they had used. Their assessment of the website was established and the impression whether from the point of view of the answering person all necessary or important applications were to be found. Missing eGovernment applications could be named. The last part of the questionnaire contained questions to assess the general attitude toward eGovernment and trust in the public administration and the Internet.

Given space limits I will not be able to present the results in their entirety, but concentrate on the results of a regression analysis for the whole sample. Following this we will check whether gender differences do play any significant role. The overall results of the analysis are pictured in Table 3. As significant results we will consider only the values of the corrected R² and Beta and we will therefore concentrate on them. The depicted dimensions allow us to explain 56,3 % of the overall variance. Thus the model can claim a relatively high, significant explanatory power. What about the explanatory power of the individual determinants? As table 3 shows, only two of the dimensions have a significant influence on the variable to be explained: "Knowledge eGovernment" and "Evaluation eGovernment". With an extraordinary Beta of 0,72 the variable "Knowledge eGovernment" possesses a striking influence for the explanation of the use of eGovernment applications. Further on Evaluation eGovernment exerts a moderate positive influence with a Beta of 0,14. All other determinants have no significant influence within the specified model.

Table 3: Results

	Total Sample		Group Comparison Gender				Group Comparison Comprehensiveness			
	B	Beta	Male		female		complete		incomplete	
			B	Beta	B	Beta	B	Beta	B	Beta
Attitude Internet		n.s.		n.s.	-0,20	-0,17*		n.s.		n.s.
Knowledge Internet	0,60	0,72***	0,600	0,72***	0,57	0,69***	0,85	0,83***	0,35	0,39**
Evaluation Supply	0,13	0,14*		n.s.	0,22	0,23*		n.s.		n.s.
Services Exclusively Online		n.s.		n.s.		n.s.		n.s.		n.s.
Trust Internet		n.s.		n.s.		n.s.		n.s.		n.s.
Trust Public Administration		n.s.		n.s.		n.s.		n.s.		n.s.
Corr. R ²	0,56 ***		0,48 ***		0,63***		0,66***		0,11 (n.s.)	
N	156		73		83		45		63	

Gender Differences

The regression accounting for group differences based on gender provided the following results. The explanatory power of the model for female students is stronger (62,6 %) compared to 47,6 % for males. But as stated above the value for men is also quite good and for both groups the respective value is significant. With respect to the individual determinants and the explained variance in the respective group, a picture develops that seems to tell us, that for the 73 male students only the knowledge about available eGovernment applications is relevant with a strong Beta of 0,72. For the 83 female students a more differentiated construct is required. In this group knowledge eGovernment

is also the strongest predictor (Beta: 0,69). Nevertheless there are two further influencing factors, i.e. evaluation eGovernment with a Beta of 0,23. Thus there is a moderately positive-linear relationship between the use of eGovernment and the evaluation of the eGovernment offerings only to be found among the group of female students. With a Beta of 0,17 a positive attitude towards the Internet also influences the use of eGovernment applications of female students.

Thus it can be ascertained, that the use of eGovernment applications needs to be explained differently for female and male students and a strategy aiming at an increased use of eGovernment should take these differences under consideration.

Important Services

Comparing the groups based on the variable "ImportantServices" the data set was divided into two parts: (a) yes, all important services are available and (b) no, not all important services are available. Taking the 63 respondents which do not share the opinion that all important services are available, the explanatory model can explain only 10,5% of the overall variance with a low significance of only 5,5%. This means that the value of R² should not be explained. Individual influences within the model, however, could be significant and therefore of explanatory value. And this is in fact the case. Within the model again "Knowledge eGovernment" is the most significant variable with a Beta of 0,39. Within the group of the 45 persons, which consider that all important eGovernment services are available the model explains 66,2% of the variance and is thus significant. Here again the dimension "Knowledge eGovernment" has the most important explanatory power and with a Beta of 0,83 features a very good and significant explanation.

5. Interpretation

The results show, that with the exception of hypothesis 2 and hypothesis 3 and with respect to sex differences hypothesis 1, no other hypothesis could be verified for the explanatory model as a whole. For all other hypotheses no significant relationships could be verified. The results of the quantitative study thus have only revealed two dimensions, which are of importance for the use of eGovernment applications offered by the public administration. The use by students of the University of Stuttgart seems only to depend on the following factors:

- Knowledge about existing web offerings (H2), and
- The positive evaluation of the web site by the user (H3).

The strongest Influence on the usage patterns of the surveyed students could not be confirmed with the help of a theoretical construct. The knowledge about online-offerings as an influential variable for the use of the government applications could have not been operationalized with an explicit theoretical foundation on the basis of the literature research. The reasoning, to keep the construct in the explanatory model had been that there might be an indirect connection between cognitive capabilities, the resulting subjective knowledge and the intention to act (Konation). Only the knowledge of an object enables the affective and emotional valuation of an object and leads to its use (or the refusal to use). In fact the knowledge about eGovernment has the greatest predictive influence on its use. Are offerings unknown, they are consequently not being used.

As our discussions with experts in the IT administration showed this - in some respects simple - relationship is hardly recognized by actors in the public administration. One of the interviewed experts told us that at city hall there are no advertisements for eGovernment solutions and that there is no intention or budget to advertise the availability of eGovernment applications potentially establishing a vicious circle of slow adoption.

The second dimension, which showed some significance, confirms well to the theoretical considerations of the End-User Computing Satisfaction-Model (EUCS) as developed by Doll/Torzadek (1988). The EUCS has been part of the considerations used for the creation of the explanatory model. The items used for the indicator "impression supply" (user friendliness, actuality, completeness) are more or less identical with the items (ease of use, timeliness, content) of the End-User Computing Satisfaction-Model. Even if the specific operationalization of the dimensions is not identical, the intentions of the questions are similar. The results which Doll and Torkzadeh achieved were more robust, however (cp. Doll/Torkzadeh 1988: 266ff). Nevertheless it can be confirmed that a positive impression of the website can positively influence usage patterns by students and hypothesis three thus is also verified.

The impression of the website has also been considered as extremely important by the IT staff as the expert interviews showed. IT specialists put a stress on ease of use issues, usability, technical viability, internal logic, self explanatoriness etc.

All other suggested determinants for the use of eGovernment offerings, in spite of their importance as stated in various theoretical discussions have shown to be of no direct influence. This is somewhat surprising since especially the dimension "trust" is given such a high priority in the literature. How can it be that the assumption very often discussed and verified in the literature, even in the differentiation into the sub dimensions of "trust in internet" and "trust in public administration", could not be verified within the scope of our specific study?

There could be four explanations resulting from two perspectives:

- From a theoretical point of view it could be argued that the theoretical considerations on which the used instruments have been based are not coherent and free of contradictions.
- Or: that based on this, the false assumptions are not to be "found" in the data. But the used instruments have been verified in empirical studies over many years and the adoption promoting effect of trust is considered to be verified (especially in research on e commerce.)
- From a methodological point of view the influence of too small a number of cases and the resulting lack of representativeness could be mentioned. If, as it is the case with our data set – the number of cases is actually small and arbitrarily drawn, the influence of a dimension on the specific group surveyed can be excluded.

The methodologically most plausible reason, however, would be a lacking preciseness of the dimensions used. Insofar in the following a factor analysis will be done - by doing it we try to assess the selectivity between the two sub categories of the trust dimension.

A principal component analysis was done, which is based on the assumption that the overall variance of a variable can be explained by a factor solution. The sum of all relevant factors adds up to 100%. The value of the explained variance tells us, how many per cent the factor can explain. The difference up to 100% will be explained by factors with an eigenvalue <1 and which are not listed in the table. The eigenvalue determines the part of the variance of all initial variables, which can be explained by this factor. The factor loadings again determine the relation of the factor to the individual variables. The value of the communalities shows us, which explained variance part the factors have in common in relation to the one variable.

Our calculations reveal that the factors in the factor loadings possess independent from one another explanatory power for the variables. The high eigenvalues point to a significant explanatory power of the overall variance of all variables and with 50,3% resp. 24,8% the sub dimensions also do have a high explanatory power within the group of examined factors.

Insofar there remain only the following two explanations for the not verifiable influence of trust on the use of eGovernment offerings by the students. Either the supposed influence of trust for this sample is not relevant, or the used sample resp. the return rate has led to a misrepresentation of the results. What do we do now?

In order to shed some light on this problem, the issue of trust was discussed with the people from the IT department. In the interviews it became clear that trust was something that the experts interpreted as "given" and not of direct impact on the use of eGovernment applications. At least the experts believed that an essential trust among the population is available. In the focus group discussion the issue of trust on the one hand was considered as important by the students, but in the other hand it seemed to play a negligible role when the actual behavior on the internet was discussed. The students claimed that mainly for reasons of comfortability they would prefer interactions over the Internet as compared to interactions with the public administrations on a personal basis or by regular mail. Their actual behavior actually contradicted this statement, however, as we have seen the available Internet applications are underused. In the focus group discussions this was at the end defined at an information problem. It is not apparent enough what and where the respective services are available, neither in the data nor in the discussions there was a confirmation of the claim by Caroline Tolbert and Karen Mossberger (2006) that the use of local government Web sites would

creates greater trust in local government. In the discussions the attitude was prevalent that students trust and cherish the eGovernment process but not the public administration (Cp. Sweeney 2008).

With regard to gender specifics it can be stated that a positive attitude towards the Internet by female students positively influences the use of online offerings by the public administration and that they are more liable to be impressed by a user friendly design of eGovernment applications.

6. Conclusion

Recently, David Coursey and Donald F. Norris (2008) claimed: "Not only is eGovernment research nascent, there is sparse theory development and testing" (p. 523). The goal of this study was to advance the empirical knowledge and theoretical underpinnings of eGovernment research. The aim of the project at first had not been to test a new theory but try to linkup to existing knowledge and try to use theoretical models and hypotheses already available in the literature in order to achieve some accumulative knowledge. Especially the following four models were considered

- The end-user computing satisfaction model (EUCS)
- The concept of trustworthiness
- Diffusion of Innovation (DOI) and
- Technology Acceptance Model (TAM).

The results showed that the theoretical models had only limited explanatory power for our sample. It can be stated that the use of eGovernment applications is in principle a routine activity for students, but is only exercised if the knowledge about the availability of respective applications is available. The students demonstrate a "realistic" interpretation of the technology, far removed from over-enthusiastic expectations. Thus only 11,7 % of the people answering said that so far they had used the possibility of completing an online form – in spite of the fact that every respondent could have done this in the process of registering at the University. In addition only a small number of 1,9% completed a transaction with the public administration on the Internet and only 3,1 % used any possibility to participate in discussions or policy making processes. This is not a very promising number for those who expected that the Internet could possibly change the political behavior of people in a positive manner or could increase their participation in the political process. The focus group discussions – using the example of the controversial decision to construct a new underground main train station which led to partially violent clashes between protesters and police – showed that students for informing themselves about this controversial issue and discussing it were not using the "official" pathways but were active in facebook groups etc. and ruled out to visit the official web site – except for collecting some basic information. Just as a side note it should be mentioned that the official web site concerned with the construction of the new train station was lauded by "independent" eGovernment specialists for its clarity, transparency and possibilities to engage.

The further development of eGovernment will be necessary to keep up the overall legitimacy of the public administration. But it is doubtful whether the increasing availability of eGovernment solutions will strengthen the credibility of the public administration. Our focus group discussions have shown that the expectations especially from younger users are that public administration web sites keep up with the pace of things to be found on commercial web sites, social networks etc. There is no indication, however, that the public administration will turn from a belatedly "me, too" to a forerunner in IT development.

References

- Armbruster, R 2007: Setting the Pace: EGovernment Stuttgart. In: One-Stop-Europe: Citizen-Centered EGovernment, ed. by Dieter Klumpp. Alcatel-Lucent Stiftung für Kommunikationsforschung: Stuttgart 29-32
- Bechmann, G u.a. 2003: *Elektronische Medien und Verwaltungshandeln. Rationalisierung und Demokratisierung*. Endbericht. Karlsruhe
- Carter, L. & Bélanger, F. 2005: The Utilization of EGovernment Services: Citizen Trust, Innovation and Acceptance Factors. *Information Systems Journal*, 15(1), 5-25
- Cimander, R 2006: Nützlichkeit und Benutzbarkeit von Online-Angeboten öffentlicher Verwaltung. In: Wind, Martin & Kröger, Detlef (Hrsg.): *Handbuch der IT in der Verwaltung*. Berlin, Heidelberg: Springer. 91-120
- Colesca, S. E. 2009: Understanding Trust in eGovernment. In: *Inzinerine Ekonomica-Engineering Economics* (3) 7-15
- Coursey, D. & Norris, D. F. 2008: Models of EGovernment: Are They Correct? An Empirical Assessment. *Public Administration Review*, 68(3), 523-536.

- Doll, W. J. & Torkzadeh, G. 1988: The Measurement of End-User Computing Satisfaction. In: MIS-Quarterly, 12 (2) 259-274
- Gauld, R., Gray, A., & McComb, S. 2009: How Responsive Is EGovernment? Evidence from Australia and New Zealand. *Government Information Quarterly*, 26(1), 69-74
- Grimmer, Klaus 2003: Strukturwandel der Verwaltung durch EGovernment? Entwicklungslinien und Perspektiven der Verwaltungsinformatisierung. In: Bernhard Bubeck/ Gerhard Fuchs (Hrsg.) 2003: *eGovernment und der Strukturwandel der Verwaltung - Das Beispiel der elektronischen Beschaffung und Vergabe*. Arbeitsbericht Nr. 228 der Akademie für Technikfolgenabschätzung, Stuttgart, 28-39
- Henman, P 2010: Governing Electronically: EGovernment and the Reconfiguration of Public Administration, Policy and Power. London: Palgrave Macmillan
- Kim, Chon-Kyun 2007: A Cross-national Analysis of Global EGovernment. *Public Organiz Rev* 7, 317–329
- Margetts, H. 2008: Public Management Change and EGovernment: The Emergence of Digital-Era Governance. In A. Chadwick & P. N. Howard (Eds.), *The Routledge Handbook of Internet Politics*. (pp. 114-27). London: Routledge.
- McKnight, D. Harrison, Choudhury, Vivek & Kacmar, Charles 2002: Developing and validating trust measures for e-commerce: an integrative typology. *Information Systems Research*, 13 (3), 334-359
- McNeal, R., Hale, K., & Dotterweich, L. 2008: Citizen–Government Interaction and the Internet: Expectations and Accomplishments in Contact, Quality, and Trust. *Journal of Information Technology & Politics*, 5(2), 213-229
- PEW Internet & American Life Project 2010: *Government Online. The internet gives citizens new paths to government services and information*. Washington (<http://pewinternet.org/Reports/2010/Government-Online.aspx>)
- Sweeney, A. D. P. 2008: Electronic Government-Citizen Relationships – Exploring Citizen Perspectives. *Journal of Information Technology & Politics*, 4(2), 101-116
- Tolbert, C.J. & K. Mossberger 2006: The Effects of EGovernment on Trust and Confidence in Government. *Public Administration Review* 66(3): 354-69
- Wohlers, T. E. 2009: The Digital World of Local Government: A Comparative Analysis of the United States and Germany. *Journal of Information Technology & Politics*, 6(2), 111-126

The Shrinking Digital Divide - Determinants and Technological Opportunities

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Abstract: The delivery of online public services is predicated on the target population being online. Unfortunately, those who are most in need of public services are often those who are the least likely to use the Internet. In this research we develop a statistical model with the specific objective of measuring the relative impact of age, education, income, gender and urbanity on the probability of Internet usage. We observe, based on close to 30,000 observations gathered in Canada, that age is by far the most important demographic determinant of Internet usage, while urbanity, exhibiting an interesting pattern of effect, is overshadowed by the age/affluence dyad. On the basis of these results we examine two groups: seniors who may become Internet users through the digital tablet, and the severely underprivileged who told us about their use of digital media. We ran a two-month experiment with seniors. They could freely use a desktop, a netbook or a digital tablet in a community center, asking for support if needed. We found that seniors, with no or very limited prior exposure to computers, preferred digital tablets over desktops and netbooks for prosaic reasons such as the ability to slip the device in the drawer of their night table, or to raise the tablet close to their eyes as they might have done with a book. More importantly, we found that seniors spontaneously used digital tablets in groups, either taking turns, or actively sharing in activities such as multiplayer games. We also found that vulnerable citizens – food bank users or homeless – are much less likely to rely on traditional technologies such as landline phones, than they are to use the Internet or mobile solutions, and that the problematic youths are more likely to be reached via their facebook ID or email address than via their home phone or street address.

Keywords: internet usage, demographics, region, senior, underprivileged, tablets, mobile

1. Introduction

In most advanced nations, the penetration rate of the Internet is in the vicinity of 80% and has remained relatively stable for the past few years (ITU 2009a, 2009b) – for every five adults, four report being Internet users. Who is the fifth person?

We can find plenty of aggregate data but surprisingly few detailed analyses on what he or she looks like. Horrigan et al. (2003: 8) write that “[...]several demographic factors are strong predictors of Internet use: having a college degree, being a student, being white, being employed, and having a comfortable household income.” McLeman, Foy and Clark (2010: 1) add that “[g]overnments at all levels increasingly recognize that a digital divide exists between urban/suburban communities and rural and remote communities.” Add a dash of poor literacy – the OECD finds that nearly half of the population is unable to effectively function in a knowledge society (OECD 2000: 17) – and you entertain the misleading caricature of this fifth person probably being “an underprivileged rural.”

Policy makers need good data and proper mental models upon which to take sound, well-targeted and cost-effective action.

The next section of this paper is devoted to a very brief literature review on regional effects, by far the most elusive usage factor. We then build a descriptive, two-stage, model of Internet usage; section four reports on an experiment in which senior citizens were introduced to digital tablets; section five reports on surveys of Internet usage by vulnerable segments of the population; finally, we summarize what we feel are critical findings.

2. Understanding regional effects

In their recent and fairly exhaustive review of the question, McLeman, Foy and Clark (2010) observe that regions are diverse. From the suburban meadows occupied by a mixture of commuters, farmers and small businesses; to the isolated mining town, often sizeable and wealthy; to the coastal village surviving on a dwindling fish stock, unpredictable wood industry and welfare; to the very remote

locations peopled by First Nations; to the prosperous economy of small industrious communities. Regions are indeed so diverse and arbitrarily constructed that they defy analysis. We read that Internet usage is 10%-15% lower in non-urban areas because of access barriers and unfavourable demographics (Hale et al. 2010). There is anecdotal evidence, however, that the Internet is very present in remote communities as it provides a vital link to families and friends, and to society at large (Collins and Wellman 2010).

Peslak (2004) compares Internet usage rates across US regions based on 2 463 observations gathered by Pew Internet in 2002. Regions here are large aggregates such as Southeast (lowest Internet usage at 45.8%) and Pacific Northwest (highest at 72.2%). The author reports significant regional differences on age, race, education and income, and no differences on gender, employment, parental/marital/student status nor on the type of community (urban/suburban/rural).

Hale et al. (2010), run logistic regressions and report a significant urban effect in a simple demographic model, which vanishes when education and income are included. Their analysis is based on 5 586 observations gathered at the US county level. There are 1 090 metropolitan and 2 052 rural counties.

Agarwal, Animesh & Prasad (2005) propose a model where they use Internet penetration at the county level to predict Internet usage at the individual level. They use a 2SLS model in which county usage is regressed on instruments such as county's median age, income and education, using residual penetration in the second stage to predict a person's behaviour. They find a significant county effect, which they call a social influence effect. They report no significant rural effect, which had been modeled by an indicator on whether the observation came from a rural/urban county. Their analysis is based on 4 005 observations gathered from 3 142 counties. The same authors publish in 2009 a variant of their previous analysis, using this time a Probit model, a much larger sample of 45 212 observations and a smaller number of geographical locations (306 Metropolitan Statistical Areas). They report a barely significant regional effect.

Grubestic (2002) uses what may be the most interesting methodology, albeit on a different and fairly irrelevant issue: he examined how the addresses of domain name owners are geographically distributed in the state of Ohio. He geo-locates each owner using the zipcode (1 014 different locations in Ohio) and regresses the number of registrations on a handful of determinants. He finds a significant rural effect but more importantly, as the author is a geographer, his data is geo-coded at a reasonably fine grain and he introduces a Conditional Spatially Autoregressive Regression (CSAR) model, i.e. a model where the geographical location of the observation is actively used in the estimation procedure. The author shows that the error term of standard OLS models exhibits a strong spatial autocorrelation, which induces inefficiency in the estimates.

3. A model of Internet usage

3.1 Data

We were granted access to data on 28 127 individuals from two leading marketing research companies that are conducting monthly phone surveys in the Province of Quebec (Canada), where Internet usage, several demographic indicators and a six-position postal code are obtained. Individuals are selected through geographically stratified random-digit dialling and can participate only once per year. Response rates are in excess of 50%. Interviews were conducted in equal proportions between the months of January and December of 2010.

Each record has been geo-coded. Because such massive database cannot be modeled with CSAR, we computed Moran-I, a spatial correlation indicator, for various radiuses in order to select the best range. Imagine computing the proportion of Internet users within a given radius for each observation. If the radius is very short, say, 1 meter, the proportion will change abruptly, either a 1 or a 0, as it will reflect the status of the focal observation. Conversely, if the radius were infinite, the proportion of Internet users would be identical across all observations. In either case the spatial correlation of error terms would be meaningless. It is therefore important to "tune" the model to the proper radius length. In our case, Moran's I peaked at values between 5km to 10km. For convenience we have computed the number of observations within 10km of each focal observation. This value ranges from a single observation in remote areas, to a maximum of 5 400 observations in large cities.

3.2 Estimation of a demographic model

Independent variables were transformed in sets of indicators and estimates for a demographic model obtained through a logistic regression (table 1).

Table 1: Results of logistic regression^{1 2}

Variable	Descriptive		Demographics				Demographics & urbanity			
	Sample	Population	B	Wald	Sig.	Exp(B)	B	Wald	Sig.	Exp(B)
Age 18-24	5.57%	10.52%	3.994	592.22	0	54.26	4.01	596.64	0	55.15
Age 25-34	16.73%	15.52%	3.135	639.8	0	23	3.167	651.88	0	23.74
Age 35-44	19.14%	18.12%	2.65	497.84	0	14.16	2.694	513.15	0	14.79
Age 45-54	22.83%	20.10%	2.157	357.46	0	8.645	2.198	370.48	0	9.004
Age 55-64	18.95%	15.65%	1.605	202.33	0	4.977	1.637	210.46	0	5.139
Age 65-74	14.78%	10.03%	0.785	47.82	0	2.191	0.797	49.443	0	2.219
Age 75+	2.00%	10.06%	(base)							
E Primary	9.60%	25.19%	(base)							
E Secondary	32.35%	37.82%	0.686	154.84	0	1.985	0.657	141.34	0	1.928
E College	24.75%	16.15%	1.467	538.74	0	4.335	1.412	494.04	0	4.104
E Certificate	4.31%	4.90%	1.747	272.33	0	5.74	1.685	250.58	0	5.39
E Undergrad	19.54%	12.30%	1.958	714.08	0	7.086	1.881	648.05	0	6.561
E Graduate	7.83%	3.16%	2.481	484.68	0	11.96	2.396	446.94	0	10.98
E PhD	1.63%	0.48%	1.948	109.07	0	7.015	1.852	97.87	0	6.373
I < \$15k	6.05%	3.80%	(base)							
I \$15-25k	10.66%	6.94%	0.256	12.09	0	1.291	0.27	13.345	0	1.309
I \$25-35k	15.08%	10.77%	0.52	55.016	0	1.682	0.541	59.034	0	1.718
I \$35-55k	20.54%	22.58%	1.088	242.18	0	2.967	1.098	245.5	0	2.999
I \$55-75k	17.50%	19.40%	1.51	386.45	0	4.528	1.519	389.01	0	4.568
I \$75-100K	13.45%	17.04%	1.771	390.61	0	5.877	1.776	391.47	0	5.907
I \$100+k	16.72%	19.47%	2.12	475.48	0	8.33	2.115	471.32	0	8.293
L English	5.52%	4.53%	0.003	0.002	0.97	1.003	-0.01	0.009	0.9	0.993
G male	41.26%	48.44%	-0.06	2.966	0.09	0.939	-0.06	2.265	0.1	0.947
Urban							0.375	70.5	0	1.454
Constant			-2.81	471.12	0	0.06	-3.08	529.8	0	0.046
Observations	28,127	6,293,625		28,127				28,127		
Chi square				9430.7				9500.7		
R square				0.432				0.435		
% correct overall				83.9				83.9		
% correct users				93.2				93.9		
% correct non users				52.6				50		

On the left side of the table, we report the sample and population distribution of observations. The population estimates come from the 2006 quinquennial census.

The center columns report the values for the model's first stage required to isolate the regional (urban) effects. Age, education and income parameters are all very highly significant, whereas gender and language are not, despite the sample size.

The baseline demographic profile is that of a person of age 75+, whose education is limited to some elementary schooling and household income of less than \$15,000. Such person has a 5.6% predicted probability of being an Internet user. At the other extreme, a young MBA graduate, age 18-24, whose household income is over \$100 000 has a 99.7% predicted probability of Internet usage.

What is most striking, perhaps, is the importance that age has on the probability of Internet usage. Consider our sample's modal values of high school education and household income of \$35 000 - \$55

¹ We also ran a neural network estimation at a reviewer's suggestion. NN's results closely mirror those of the logistical regression. Results are available upon request.

² We have built a probability calculator available at <http://bit.ly/x8MDce>

000. A 75+ senior adult has a predicted probability of Internet usage of 26% compared to 95% for a young adult in the 18-24 age group. The predicted probability of Internet usage of a poor (under \$15 000) and uneducated young adult (elementary school) still remains a surprisingly robust 77%. (Readers may want to explore usage probabilities with a calculator available at <http://bit.ly/x8MDce>).

3.3 Spatial distribution of errors

We can now attack the regional issue by considering the spatial nature of the error terms (Figure 1). This figure shows the average error of the demographic model at each level of spatial density. For instance, there were 78 isolated observations without anyone other than the focal individual within 10km. Among this subset, the observed proportion of Internet users was 55%, whereas the average predicted value was 64%.

There is a clear pattern here, with observations from sparsely populated regions showing more negative errors than one would expect by chance, a sure sign of a population density (urban) effect. A spline regression³ places the knot at 348 observations (Marsh & Cormier 2002). We can now compute an urban indicator that will range from a minimum slightly above zero, to a maximum of one, when the number of observations within 10km of a focal value is at 348 or more. An isolated observation scores 1/348. An observation in a metropolis, downtown or in the suburbs, or in a medium sized remote community⁴ will score 1. Others will score accordingly to the observed population density of their 10km neighbourhood.

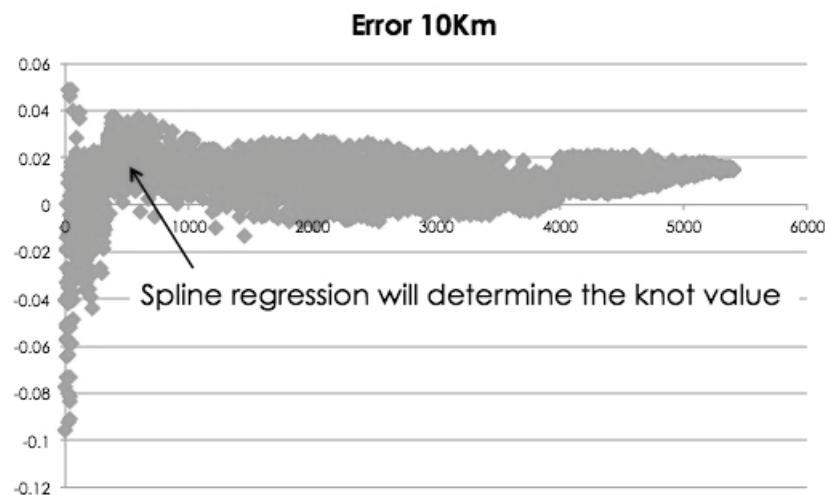


Figure 1: Average error as a function of population density

We can return to our logistic regression (Table 1) and see on the right-hand side that the urban factor is significant, but quite small. Our young, wealthy MBA graduate who was predicted to be an Internet user at 99.7% has now a 99.5% chance of being an Internet user if he or she lives in isolation. An urban modal observation (45-54 years-old high school graduate living in an household with a \$35 000 - \$55 000 income) is predicted to be an Internet user with a 78% probability, vs 70% for her/his isolated counterpart.

We now turn our attention to two groups: the seniors and the underprivileged. Our reasons for focusing on seniors should be obvious by now. Our reasons for studying the Internet habits of the underprivileged are two-fold. First, income and education are important predictors of Internet usage. It is easy to predict that usage rate of the underprivileged will be much lower than that of the population in general and, tragically, it is also a group that needs social services more than any other. Second, the situation of underprivileged young adults is peculiar. As we have seen in the brief discussion of our findings, Internet usage among this segment is predicted to be above that of the population as a whole. Yet, policies targeting this group completely ignore this fact and generate plans assuming that those underprivileged are not Internet users.

³ Estimates available on request

⁴ This knot value approximately translates into a population of 70 000 adults living in a 10Km radius of the focal observation

4. What happens when seniors meet a tablet?

The Internet is, in theory, a valuable asset for senior citizens, irrespective of the provision of social services. Carstensen et al. (2005) write that information access provides a feeling of safety and improves the quality of personal relationships. Yet seniors are frequently described as “innovation-resistant” (see for example: Zeithaml and Gilly, 1987; Rosen and Weil, 1995; Adler, 2006). This resistance is rooted in generally neutral to negative attitude towards change, but it has also been linked, critically, to inappropriate innovative designs. Designs that require dexterity which seniors no longer have (e.g. tiny phone’s keyboards and impossibly small fonts) or designs that would suggest a burgeoning limitation and make seniors feel as if they were terminally handicapped (Colin & Kerjosse, 2000) especially when these designs promise benefits such as “time saving” that are of little or no use for many who are doing their best to meaningfully fill their days (Caradec 1999). Bergadaa & Hebali (2001) write that seniors’ reluctance towards information technologies is not so much directed at applications, but at cumbersome and ineffectual devices.

We are witnessing the explosive birth of a new generation of devices, the digital tablets, devices that have the potential of radically changing how we relate to information and the Internet. Reasonably affordable, lightweight, without intimidating keyboard, providing autonomy for a full day, free of complex boot-and-login routines, providing a simple layout and navigation logic making it nearly impossible to crash and much less likely to trap users in a navigational dead-end, tablets such as the iPad raise the possibility that they are a meaningful bridge to bring more users on the better side of the digital divide.

The question we wish to address is whether a digital tablet is really perceived by seniors as a simpler and better way to participate in the information revolution, or if it is, as some of us feared, an even more, deceptively, complex tool, appreciated by the tech elite but practically worthless to the perplexed.

We can easily find anecdotal evidence that some seniors are indeed receptive (ex: Alpeyev & Eki 2010) and that literacy barriers to the use of these devices are indeed quite low (see redapes.org/app4apes) but no academic work that would provide the beginning of satisfactory answers.

4.1 Methodology

We teamed with a publicly subsidized Internet training center located in the remote community of La Sarre (population 7 000) located in the Canadian province of Quebec. This center offers seniors several computer/Internet initiation courses using typical desktops. Over the course of one month, a group of 10 uninitiated seniors, 7 women and 3 men, were offered to freely choose between a desktop, a netbook and an iPad. All devices had been configured to offer various sets of applications (links to news sources, games, weather, video, mail, chat, browsing, word processing, etc.) and sat in a row on a long table located in a communal area freely accessible to our subjects within the center’s normal operating hours.

During an initial 3-hour meeting, the three devices were introduced and seniors participated in supervised trials concluded by a Q&A period.

- On site educators were specifically told not to interfere with the seniors’ discovery process.
- At all times, an educator was present in order to answer questions relative to the hardware/software, to resolve a given issue or simply asked out of curiosity about these technologies.
- Customized training could be offered, but only if participants had specifically asked for formal training.
- Educators were asked to observe the subjects’ behaviour and note whatever they felt might be relevant.

At the end of the month, participants spontaneously asked if it could be possible to extend the experiment for an additional month. We made the necessary arrangements to equip the iPad with a 3G SIM such that participants could bring the device back home and use it in a more natural setting.

Participants talked to us at length, on four occasions. The first meeting was meant to understand their expectations and test and configure the devices.

The second meeting took place one month later. This meeting prompted us to extend our presence for three more weeks.

A third meeting at the end of the additional three weeks allowed us to re-interview the participants. Last, a videoconference was held two weeks later in order to fully debrief participants.

4.2 Results

Seniors have been enthusiastic towards the digital tablet, but for unexpected reasons. We heard most praise about the size of the device that one can slip in the night table's drawer and lightness that makes it conceivable to carry the tablet to the medical center or the doctor's office. We were also told that such device would be convenient in the case of hospitalization, where it could be used to keep in touch with family and friends, or to read, or to kill time playing games. We were told that the shape of the digital tablet would allow to conveniently put it out of sight, under a pillow, if one had to leave the room.

An eventual move to a retirement home was a very significant concern for our participants. Here again, a digital tablet was felt to be a more appropriate, if not the only digital device that would make sense in such an environment, due to space constraints. One senior, living in a retirement home, expressed regret upon having recently purchased a laptop computer.

Others commented that the digital tablet's weight and size were very convenient because it made it much easier to see what was on the screen, simply by raising the device closer to the eyes, just as they would do with a book or a newspaper.

Seniors were also pleased to feel safer using a digital tablet to surf the Internet, viruses being a significant area of concern.

On the negative side, one participant commented that the screen size was small compared to that of a desktop computer and that it would be difficult to conduct office chores such as word processing.

Yet the biggest challenge is that seniors have no idea what to expect from a digital tablet. Even the uninitiated has at least some elementary notions on how a computer is supposed to work, the most salient being that there should be a keyboard. Seniors were disconcerted in front of the digital tablet and frequently stared at the screen trying to figure how to activate the keyboard.

Three factors make things complicated. First, seniors are self-conscious and, obviously, do not want to be humiliated by technology. Unlike children who do not mind learning by trial and error, seniors want to protect their respectability and would rather learn by "trial and success". This translates into a tense relationship with the limitations of a digital keyboard on which a small subset of letters and symbols are displayed at any given moment. A large number of comments were made about avoiding typos and getting to the accentuated vowels that are used in French.

Second, this self-consciousness raises questions as to why exactly are we suggesting that seniors might prefer a digital tablet, instead of a full-fledged computer. Until tablets become mainstream, we could expect at least a small portion of this population to resist the idea of adopting of a "crippled" device.

Third, and maybe more critically, educators were even more eager to dwell on these issues. This might reflect their experience with users who have strong expectations as to how things should be done. It could also stem from their own pre-conceptions because their role is precisely to teach seniors and other clientele how to properly use keyboards to achieve a desired outcome: ctrl-alt-delete & id/pw combo is a sophisticated concept that one may not wish to see replaced by a finger poke.

Despite such caveats, when asked which device they would rather buy for themselves or recommend to someone else, seniors unanimously picked the digital tablet.

Yet, the social nature of the digital tablet could well have been our most important finding. Seniors spontaneously used digital tablets in groups, either taking turns, or actively sharing in activities such as multiplayer games. It is difficult to overestimate the impact of this usage pattern, as it is clearly a path to technological empowerment where users learn from each other, and a tool to promote social interaction rather than isolation.

5. The somewhat surprising technological ecosystem of the underprivileged

The underprivileged are heavy users of social services. They are also less likely to be Internet users. A typical argument can be found in Dugdale et al. (2005: 111) who observe that “[government emphasis] has been on providing the opportunity for Internet connection, seeing individuals as being responsible for the choice and financing of home connection.” The authors argue that this puts an undue burden on already frail shoulders and that more should be done to bridge the digital divide. One such example is the role played by public libraries that are seen as a crucial access points for the homeless and other vulnerable citizens (Winkelstein & Cortez 2010).

Stakes are high as there is evidence that a young homeless who is capable of maintaining relationships with mainstream friends through the Internet is more likely to reintegrate society at some point in the future (Rice et al. 2010). The authors report that more than 95% of these adolescent homeless were connected to the Internet, through public libraries. Quite obviously, assumptions that the critically underprivileged is on the wrong side of the digital divide are misguided.

Our concern in this portion of the study was to gain a better understanding of the types of technologies used by school dropouts, homeless, people living below the poverty line, and other severely challenged individuals.

5.1 Methodology

We focused on two populations: food bank patrons in Quebec city (population 500,000), and vulnerable youths (school dropouts/unemployed, etc.) who are in contact with social workers in the remote community of La Sarre, mentioned earlier in this paper. In both cases we interviewed social workers and surveyed the underprivileged. A total of 14 social workers have been interviewed face to face. A total of 128 food bank patrons and 132 vulnerable youths have been surveyed face to face.

5.2 Results

Many social workers expressed more concern than enthusiasm with respect to communication technologies in the hands of their clients. They were unlikely to give their personal phone numbers for fear of being harassed, expressing a strong preference for face-to-face interactions. They also observed that the Internet was sometimes used for questionable activities (dealing in drugs or prostitution), albeit acknowledging practical uses such as social network maintenance, job hunting, emailing social workers and so on.

Several comments were also made about the complexity of technologies that are not perceived to be adequate for people with mental illnesses or serious cognitive limitations. As the interviews progressed, it became clear that a distinction should be made between vulnerable youths who may have fallen victim of poor decisions and questionable behaviours, and others, generally older persons, who experience chronic or recurring problems. Social workers advocate a simplification of bureaucratic rules and tend to fill-out forms for their clients rather trying to help them do it by themselves.

Interestingly, social workers all agreed that the Internet and mobile phone could be useful tools. It is simply not part of the day-to-day experience, with the exception of a few social workers dealing mostly with young clients.

Food-bank patrons were, by and large, men, age 45 or more, living in flats, rooms or pensions. Only 2% reported to be homeless. The crucial finding is that no less than 55% of these people reported having used the Internet at least once during the previous week. This figure is surprisingly high considering that only 48% reported having a mobile phone and that a mere 35% reported having a landline phone, a device found in more than 99% of households according to Statistic Canada's census.

In the case of vulnerable youths, the vast majority were under 25 years of age and roughly as likely to be male or female. Internet usage, at least once during the previous week, was reported by 92% of the participants; 66% declared a landline phone and 50% a mobile phone. No less than 91% of the 18-24 years old reported being active on Facebook. Here again, the reality is that even though the underprivileged is less likely to be an Internet user than the affluent (the probability of usage for an affluent young adult is close to 100%), the Internet is significantly more prevalent than the telephone. The important lesson here is that there is a large communication gap between the underprivileged and the affluent, but that contrary to a widely held belief, the gap is narrower in the digital realm.

6. Discussion

Our findings confirm the demography of the Internet as we could fairly easily have guessed it – young, educated and wealthy people use the Internet; old, uneducated and poor people, not so much. Gender and language have no impact whatsoever. What was not so easy to guess, however, is that age is by far the most important predictor of Internet usage. In retrospect, we knew this all along as we can hardly imagine a teenager far from a connected device.

Our findings shine a new light on regional impacts. Our sample size and accurate geo-location allowed us to compute fine-grained penetration rates that are not available from public sources and provide insights that cannot be found in the extant literature. Yes, there is a significant urban effect. But it is dwarfed by the basic demographics and may not be where the most urgent policies are needed. Non-users of the Internet are older people living in large cities. Seniors are the low-hanging fruits of technological integration policies.

Regional/urban impact on Internet usage might not be generalizable to other locales -- Canada is a country of a few fairly large cities and many isolated communities, not unlike Australia or the USA, but certainly different from most countries of Continental Europe. Yet this could be construed as irrelevant, because we find a very weak urbanity effect in an environment of considerable regional diversity. Our main result is that age, mostly, and affluence to a lesser degree, impact Internet usage.

Our findings show, somewhat unexpectedly, that technology is an empowering, socially relevant, tool. Seniors spontaneously shared experiences around digital tablets. Several statements that we cannot report here because of space limitations hammered the point that seniors want to remain intellectually active, socially connected, and that they clearly understand that these technologies can help them reach such goals.

This was even more poignant in our interactions with social workers and vulnerable youths who sometimes confided that computers were their best friends. It is difficult for us to imagine being hurt by someone. Surprising to hear someone say that interacting with and through a computer has helped restore self-confidence. Important to realize that those facing the largest challenges in this world are turning to new tools faster than those who are supposed to help.

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References

- Adler, R. (2006) Older Americans, broadband and the future of the net, Santa Clara, CA: SeniorNet.
- Agarwal, Ritu, Animesh Animesh & Kislaya Prasad (2005), "Social Interactions and the 'Digital Divide': Explaining Regional Variations in Internet Use", Working paper RHS-06-024. Robert H. Smith School of Business, University of Maryland
- Agarwal, Ritu, Animesh Animesh & Kislaya Prasad (2009), "Social Interactions and the 'Digital Divide': Explaining Regional Variations in Internet Use", Research Note, Information Systems Research, 20(2): 277-294
- Alpeyev, Pavel and Yoshinori Eki (2010), "The iPad Leads Apple to the Elderly", Bloomberg Business Week, August 12th
- Bergadaà, M. et M.J. Hebalí. (2001), "Attitudes des seniors à l'égard d'Internet". Proceedings of the Marketing and Consumer Behavior Conference, Lalonde-les-Maures (France)
- Caradec, V. (1999) "Vieillesse et usage des technologies. Une perspective identitaire et relationnelle," Communication et personnes âgées 17 (96): 45-96
- Carstensen, L.L., J.A. Mikels (2005), "At the intersection of emotion and cognition - Aging and the positivity effect", Current Directions in Psychological Science, 14 (3): 117-121.

- Colin, C. et R. Kerjose (2000) "Handicaps-Incapacités-Dépendance. Premiers travaux d'exploitation de l'enquête HID". Proceedings, Montpellier
- Collins, J. L., & B. Wellman (2010) "Small Town in the Internet Society: Chappleau Is No Longer an Island". *American Behavioral Scientist*, 53(9), 1344-1366
- Dugdale, Anni, Anne Daly, Franco Papandrea & Maria Maley (2005), "Accessing e-government : challenges for citizens and organizations," *International Review of Administrative Sciences*, 71(1): 109-118
- Grubestic, Tony H. (2002), "Spatial Dimensions of Internet Activity," *Telecommunications Policy*, 26: 363-387
- Hale, Timothy, Sheila R. Cotton, Patricia Drentea and Melinda Goldner (2010), "Rural-Urban Differences in General and Health-Related Internet Use", *American Behavioral Scientist*, 53(9): 1304-1325
- Horrigan, John, Lee Rainie, Katherine Allen, Angie Boyce, Mary Madden & Erin O'Grady (2003), *The Ever-Shifting Internet Population: A new look at Internet access and the digital divide*, Pew Internet & American Life Project
- ITU (2009a), *Information Society Statistical Profiles 2009 – Americas*
- ITU (2009b), *Information Society Statistical Profiles 2009 – Europe*
- Marsh, Lawrence & David R. Cormier (2002), *Spline Regression Models*, SAGE University Paper, Series: Quantitative Applications in the Social Sciences, vol 137
- McLeman, Robert, Noraj Foy & Kristin Clark (2010), "Adaptive capacity-building and sustainable development in Canadian rural and remote communities: The role of information and communication technologies" Unpublished SSHRC Grant Report
- OECD (2000), *Literacy in the Information Age: final report of the international adult literacy survey*
- Peslak, A (2004), "An analysis of regional and demographic differences in United States Internet usage," *First Monday* 9(3)
- Rice, Eric, William Monro, Anamika Barman-Adhikari & Sean D. Young (2010), "Internet Use, Social Networking, and HIV/AIDS Risk for Homeless Adolescents," *Journal of Adolescent Health*, 47(6): 610-613
- Rosen, L.D et M.M. Weil (1995), "Adult and teenage use of consumer, business, and entertainment technology: Potholes on the information superhighway?" *Journal of Consumers Affairs* 29 (1): 55-84.
- Wikelstein, Julie Ann and Edwin-Michael Cortez (2010), "How and Why Public Libraries Can, Should and Do Facilitate the Use of the Internet by the Homeless: a look at the programs. Barriers and political climate, Communication presented at BOBCATSSS, Parma (Italy)
- Zeithaml, V.A et M.C Gilly (1987), "Characteristics affecting the acceptance of retailing technologies: A comparison of elderly and nonelderly consumers," *Journal of Retailing* 63 (1): 49-68.

Reducing IT Related Costs Using Application Portfolio Rationalization: A Study Focusing on Reducing Application Portfolio Size And Complexity in Small Municipalities

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Abstract: Organizations often deal with large and complex application portfolios. Government organizations are no different. Application Portfolio Rationalization can be used to reduce the size and complexity of the application portfolio, resulting in cost reduction. This paper focuses on rationalizing the application portfolio of small municipalities in order to reduce overall IT costs. It is shown that rationalization is a continuously ongoing process and the optimization of the portfolio, as well as managing changes made to the portfolio is key to keeping the portfolio rationalized. Case studies have been executed at four small municipalities to determine the problem areas of small municipalities with their application portfolio, as well as key focus points for rationalization. This is combined with an intensive literature research to provide an Application Portfolio Rationalization method for small municipalities. The main goal of this method is to reduce the size and complexity of the application portfolio, but it also focuses on optimization and the management of portfolio change. This research will show that these two are also key to optimizing and rationalizing the application portfolio. It is important for municipalities that the method can be applied easily and quickly in order to be as useful as possible, this has been done by creating an online assessment, that small municipalities can fill out online. The assessment conveys the steps of the method and assesses the current situation in order to determine what has to be done. After which a report is created showing where they have to put their focus in order to rationalize their application portfolio.

Keywords: application portfolio rationalization, municipalities, APR, public sector, rationalization method

1. Introduction

IT is essential in government agencies, including municipalities. However, government plans are to reduce costs, therefore IT is one of the many subjects to be looked into for reducing costs. Rationalizing the application landscape can help in reducing costs in government agencies. This research focusses on small municipalities (15,000-40,000 inhabitants (Vereniging van Nederlandse Gemeenten, 2011)). This research paper looks at reducing IT related costs in small municipalities from an Enterprise Architecture point of view, using Application Portfolio Rationalization. The definition used for Application Portfolio Rationalization in this research is: "An evolutionary process that involves the continuous assessment of applications to respond to business process changes, improve application usability and reduce the total cost of ownership (Sarissamlis, 2006)."

Many organizations face a vast and complex application landscape. This can lead to inefficient organization processes, taking up unnecessary time, towering application costs and inadequate business process support. Application Portfolio Rationalization (APR) is a method that can be used to reduce the complexity of the application landscape (Sarissamlis, 2006).

At the basis of this research is the following research question:

"How can small municipalities reduce IT related costs using Application Portfolio Rationalization?"

Existing APR methods are too general and do not provide the necessary tools a municipality needs to be able to rationalize its portfolio. Municipalities are a very specific type of organization, where focus is not necessarily on the IT they use in their processes, but on the products that they offer to their inhabitants. Also municipalities are highly alike, due to the products they offer and the tasks that they perform. Therefore a method can be created that focuses more specifically on rationalization areas relevant for municipalities, in this way offering a better way for achieving Application Portfolio Rationalization within municipalities. Instead of the more general methods, that do not focus on areas necessarily relevant for municipalities and may leave them guessing as to where their focus should be. Key factors regarding small municipalities and Application Portfolio Rationalization have been studied using a literature review and case study research. This has resulted in an APR method that can be used to reduce the size of the application portfolio of small municipalities. The method created in this research provides some necessary details for municipalities to be able to rationalize their

portfolio. One time rationalization of the portfolio, however, is not enough (Vogelezang, 2008), through optimization of portfolio management and managing changes, the portfolio can be kept as rationalized as possible. Finally, an assessment has been created that offers municipalities an easy and quick way to apply the created Application Portfolio Rationalization method.

2. Related literature

In the literature review several topics will be highlighted. First and foremost Enterprise Architecture and Application Portfolio Rationalization. Also business & IT alignment will be discussed, aligning IT with business processes avoiding unnecessary costs due to misalignment (Silvius, 2007). A survey on IT cost reduction in government agencies done by Ernst & Young (2011) highlighted the topics of standardization, collaboration, and centralization as being important when discussing cost reduction in Dutch municipalities, therefore these subjects will also be discussed. Also IT investments are discussed, shortly describing the advantages and disadvantages of IT investments. The topics and consecutive methods discussed in this section serve as a stepping stone for the remainder of the research, and the developed method for Application Portfolio Rationalization.

2.1 Enterprise architecture and application portfolio rationalization

Sarissamlis (2006) defined application portfolio rationalization as an evolving process needing the continuous assessment of applications to be able to respond to modifications in business processes and increase application usability and reducing the total cost of ownership. Application portfolio rationalization allows for reducing the complexity of the application portfolio (Sarissamlis, 2006). Application Portfolio Rationalization is a process in Enterprise Architecture which can be defined as a framework or “blueprint” for how an organization reaches its current and future business goals (Dahalin, Razak, Ibrahim, Yusop, & Kasiran, 2010), (Marques Pereira & Sousa, 2004), (Jonkers, et al., 2006). An architecture is the “fundamental organization of a system, embodied in its component, their relationships to each other and the environment, and the principles governing its design and evolution” (IEEE, 2000). Enterprise architecture is the basic make up of an organization, either entirely, or together with associates, suppliers or clients, or partly (e.g. a department), in addition to the principles governing its design and evolution (Opengroup, 2003). Enterprise Architecture is necessary to help organizations determine what is important and has to be given priority from a business point of view, while McKeen and Smith (2010) assisting in determining how an organization could benefit from technological innovation (Jonkers, Lankhorst, Doest, & Wieringa, 2006). Through successfully applying Enterprise Architecture a reduction in operational maintenance costs may occur (Bird, 1998).

The process of Application Portfolio Rationalization is an ongoing process that will result in improved usability and reduced overall costs of the application portfolio. By actively managing the application portfolio, growth will be minimized or the portfolio may even be reduced in size (Vogelezang, 2008). Multiple methods for Application Portfolio Rationalization have been developed, showing which steps to take towards rationalizing the portfolio. Active management of the Application Portfolio, can help reduce growth or even reduce size of the portfolio, which may eventually lead to a substantial cost reduction. It needs to be considered if an application fits in the architectural environment that it is set in, because it is not cost effective if extra non-standard knowledge is needed for the application (Vogelezang, 2008).

Fabriek, Brinkkemper and Dullemen (2007) developed an APR method, consisting of three phases. The assessment phase, the evaluation phase and the planning phase. The assessment phase looks at the applications separately and at all the applications together as a whole. Within the evaluation phase value assessments and technical assessments are evaluated. The planning phase determines the actions that need to be taken, allocates resources and makes a time-plan in order to reduce the application portfolio size.

McKeen and Smith (2010) developed a chart that can help organizations rationalize their application portfolio. This chart can be filled out by organization and judges applications on support cost, technical condition and business value.

Simon, Fischback and Schoder (2010) also developed an integrated framework for Application Portfolio Management, showing what steps need to be taken in order to optimize the application

portfolio. Focusing on creating understanding, insight, portfolio quality and excellence, and finally IT portfolio excellence.

2.2 Business and IT alignment

Business & IT Alignment (BITA) can be defined as the level to which IT applications enable and form business strategy and processes, in addition to the process to realize this (Silvius, 2007). Business and IT alignment describes the importance of IT aligning with business goals. When these goals are not aligned unnecessary costs will be made and the organization will not be able to operate as efficiently and effectively as possible.

Silvius (2007) determined that amongst other actions centralization of IT procurement and Application Portfolio Rationalization are necessary to achieve Business and IT alignment.

2.3 Standardization, collaboration and centralization

Ernst and Young (2011) defined in their research amongst government agencies that standardization, collaboration and centralization are important factors in reducing costs. Standardization can create cost benefits, as well as making systems more interchangeable and interoperable (Muller, 2010). Other benefits of standardization include time reduction, transparency, and a more streamlined system (Schreiber, Eckhardt, & Laumer, 2010). Miles, Snow, Fjeldstad and Lettl (2010) concluded that collaboration between parties is necessary to save costs and further stimulate innovation. Collaboration between municipalities may be defined as inter-organizational collaboration where there possibly is a mutually shared process, the sharing of resources (like knowledge and skills) and striving for collective objectives, as well as information is being shared across between the participants (Sanders, 2007). Collaboration can also take place in the form of an inter-organizational Shared Service Center between municipalities. Centralization describes to what extent decisions are centralized within an organization, which is also a main determinant for how resources are distributed (Pugh, Hickson, Hinings, & Turner, 1968). The level of centrality will also provide a view of how municipalities are currently managing their application portfolio.

3. Case study research

Multiple case study research was performed amongst four small Dutch municipalities. These case studies took a closer look at how these municipalities manage their application portfolio, what problems they are experiencing, and finding possibilities for portfolio rationalization.

Table 1: 1 provides general information about the case study municipalities. For privacy reasons, the municipalities are not named.

Table 1: General municipal information

	Inhabitants	Surface Area	IT cost percentage of the total municipal budget
Municipality A	±23,000	±50km ²	±1,4%
Municipality B	±19,000	±43km ²	Estimated at ±3,4%
Municipality C	±20,000	±35km ²	±0,9%
Municipality D	±29,000	±62km ²	Unknown

The following paragraphs represent the general conclusions that can be drawn from the case studies.

3.1 Case study results application portfolio

It is necessary to keep a complete overview of applications. Restricting the possibility for departments to install applications by themselves, helps with keeping a good and clear overview of what the application portfolio looks like. A central database can e.g. be used to keep track of all applications.

3.2 Case study results standardization, centralization, and collaboration

Centrality is key to keeping the application portfolio rationalized. Decisions about the application portfolio should be made by one central body (department/unit), to strictly control changes to the application portfolio. Centrality of decisions will help ensure that the application portfolio remains uncluttered and applications will can properly interconnect.

Standard applications are cheaper than customized applications and can provide a basis for cooperation.

Municipalities cooperate in different ways, some share applications and management of those applications, while others merely share knowledge and skills. Through collaboration, like sharing knowledge or application acquisitions, the application portfolio can be optimized and costs can be reduced.

3.3 Case study results business and IT alignment

Business and IT alignment focuses on if the application portfolio is aligned with municipal goals, which are the products and services they offer for the inhabitants of their municipality. Applications have to support the municipal processes. All the municipalities that participated in the case studies indicated that the application portfolio has to be mainly aligned with the products the municipality offers.

4. APR method for small municipalities

An Application Portfolio Rationalization method for small municipalities has been developed. The method incorporates methods created by Fabriek, Brinkkemper and Dulleman (2007), McKeen and Smith (2010), and Simon, Fischbach and Schoder (2010). The method was designed to be applied by within the entire municipality. First and foremost the method focuses on how a municipality can rationalize its portfolio. However rationalization is only a part in a larger process, because after the portfolio is rationalized it is crucial to keep it rationalized, to prevent returning to the old situation (Vogelezang, 2008). Therefore the method also focuses on what can be done to optimize the entire application portfolio management process, as well as how to handle a request for a change.

The created APR method consists of 6 main steps, each containing sub-steps. Figure 1 shows the entire method for Application Portfolio Rationalization for small municipalities. Each main step consists of several sub-steps

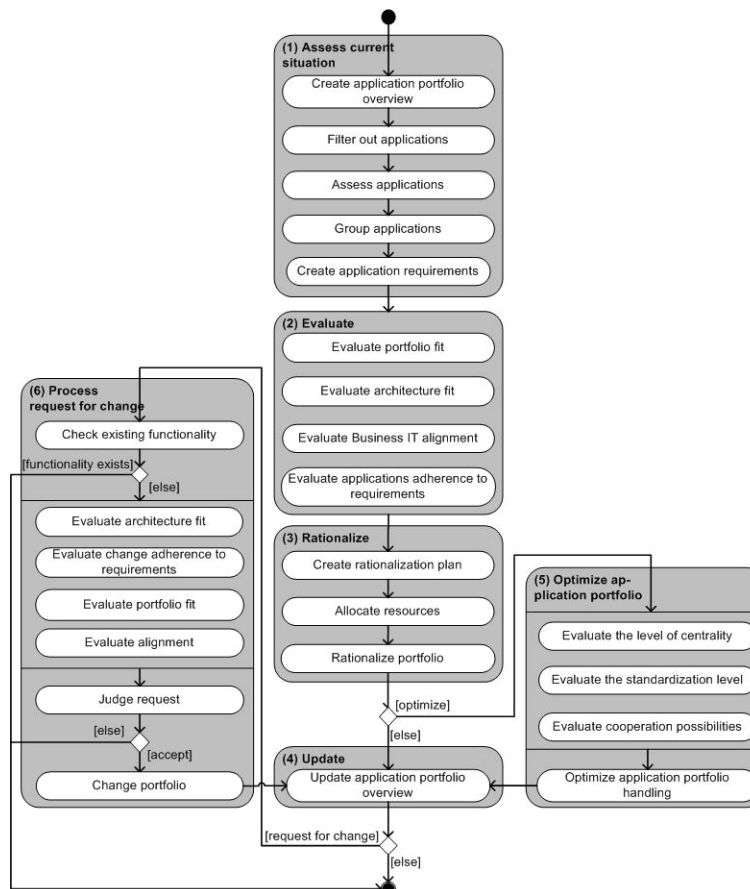


Figure 1: APR method for small municipalities

4.1 Assess current situation

Create application portfolio overview

A complete overview of all the applications is necessary as a basis of the rationalization process. This will show the as-is situation of the application portfolio. This overview should contain specific information about each application, like the purpose of the application, application cost, supplier, users, business value and technical condition.

Filter out applications

It needs to be identified if there applications for which the municipality has more licenses than necessary, e.g. if two departments individually bought the applications, but only one organizational license is necessary for organizational use. Applications that are not being used or have more licenses than needed, need to be filtered out of the application overview by for instance marking them.

Assess applications

In assessing the applications, application properties are judged and rated. These application properties can be found in the application overview. Applications can be judged on: purpose, functionality, cost, business value, technical condition, supplier and interdependencies with other applications.

Group applications

By grouping applications, the application portfolio will be better structured. Applications can be grouped based on technical specifications like (Sarissamlis, 2006): Common business process impact, shared functionality, common structure, shared data(base) usage, technological connection (e.g. programming language).

Create application requirements

A list of basic requirements may serve as a basis for judging applications. Basic requirements for an application can be: cost, technical environment, ease of use, response time, availability, and security (e.g. allowing different levels of authorization).

4.2 Evaluate

Evaluate portfolio fit

Based on the assessment and grouping made when assessing the current situation, the applications and their portfolio fit needs to be evaluated. Determining if an application should stay as-is, be removed, or if possible adjusted.

Evaluate architecture fit

The enterprise architecture of an organization dictates what the IT environment of that organization will look like. Therefore it is necessary that an application fits in the designed enterprise architecture of a municipality.

Evaluate Business & IT alignment

It is important that IT serves the main purpose of an organization, therefore applications will also need to support the municipal processes, and the output created by these applications needs to be necessary for executing these processes. For example if an application generates information, this information should serve as input for another municipal process or serve the end goal of a process.

Evaluate applications adherence to requirements

Not only new applications need to adhere to the basic application requirements, also the current applications need to adhere to those requirements. If an application does not adhere to the basic requirements set for it, it needs to be decided what to do, keep the application as-is, remove it, or change if possible.

4.3 Rationalize

Create rationalization plan

Before starting the rationalization process, it is necessary to create a plan in order to succeed. This plan needs to specify at least the following: Actions taking place in order to rationalize the portfolio, a schedule (including deadlines, performance checks, tests, etc), and change owner.

Allocate resources

Provide the resources (financial, technical, personnel) necessary to rationalize the application portfolio.

Rationalize portfolio

Based on the evaluation and planning the rationalization process of the application portfolio can take place. In this process application(s) (groups) may be kept as-is, adjusted or removed. After the rationalization process, the portfolio will be better organized, will have lower costs, and applications in the portfolio will interoperate more efficiently.

4.4 Update

Update application portfolio overview

Whenever a change has been made to the portfolio, like after the rationalization process, the portfolio overview needs to be updated to make sure that there always is a complete current view of the as-is situation.

4.5 Optimize application portfolio

Evaluate the level of centrality

By evaluating the level of centrality, it is determined how decisions regarding changes to the application portfolio are made. This evaluation determines to what extent decisions about changes to the application portfolio are centralized, meaning that it is determined if decisions are made by one central department (most likely the IT department) or does each department decides for themselves which changes they make to the application portfolio.

Evaluate the standardization level

Standardized applications are more cost friendly and they offer a better basis for cooperation. Since municipalities offer mostly the same products to their inhabitants, it makes sense for all of them to use the same standard applications. The level of standardization thus indicates the degree to which applications are standardized.

Evaluate cooperation possibilities

Cooperation may help in optimizing the application portfolio handling process. By sharing knowledge and skills, or even going a step further and bundling IT power, costs could be significantly reduced. However, there must be opportunities for cooperation with other municipalities, e.g collaborating municipalities might need to have the same application supplier.

Optimize application portfolio handling

Based on the evaluations in the previous step it can be determined what optimization steps will take place in order to optimize application portfolio handling. The organization might shift towards more centrality, customized application might be exchanged for equally suitable standards and a cooperation plan may be drafted to start the cooperation process.

4.6 Process request for change

Check existing functionality

Before granting any request for a change to the portfolio, it should be determined if the problem can be solved without making any change to the portfolio, by checking the available functionality within the portfolio.

Evaluate change adherence to requirements

The requested change needs to adhere to the basic requirements, therefore it needs to be determined if the application adheres to these requirements.

Evaluate portfolio fit

Assess the proposed change on purpose, functionality, cost, business value, technical condition, supplier, interoperability other applications, grouping. Determine based on these specifications if the change suits the portfolio. For example when adding an application: does the proposed application serve the purpose of the change, do the costs not exceed the expected business value, etc..

Evaluate Architecture fit

Determine if the application fits within the set municipal enterprise architecture, as has been described in section 4.2.

Evaluate alignment

Determine if the applications are necessary to perform the municipal processes and if their output is necessary to execute the municipal processes.

Judge request

Determine if the request for change will be accepted or declined. In extenuating circumstances, it could be decided not to stick to the requirements, or decide that the portfolio fit, or the alignment is less important, however this should never be the norm.

Change portfolio

Upon acceptance of the request for change, the portfolio needs to be changed accordingly.

5. APR Assessment: Applying the method in practice & validation

A method might prove too complex for municipalities to quickly and easily apply. To make the method quickly and easily applicable in practice, the method has been converted into an online assessment, to help determine where municipalities have to put their focus when rationalizing their application portfolio and optimizing the way they handle the application portfolio. Municipalities can fill out the assessment, which will then provide a report advising them on which areas they should focus. The assessment encompasses the steps in the method.

The assessment can be found at: <http://aprag.cedira.com/>.

In this research it has been chosen to validate the assessment instead of the method behind the assessment. This was done, due to the reason of applicability, meaning it is considered necessary that the method should be as useful in practice as possible. The assessment was validated by experts from two municipalities, municipality A and C.

5.1 Municipality A

Municipality A found the assessment to be a useful tool, covering a wide range of areas in relation to rationalization and not leaving out any topics. The assessment is easy to use and questions are clear and understandable. Municipality A found the report to be highly useful in their own rationalization process. It helps to save time in trying to figure out where the focus needs to be, making it highly applicable in practice.

5.2 Municipality C

Municipality C found the first run of the assessment to be highly successful, covering about every area. Questions in the assessment were found to be understandable and clear. Also the assessment as a tool was found very easy to work with and the general report that was created gives municipalities a good first overview.

Both interviewees agree that the assessment is highly applicable within municipalities. The comments show that it is important to develop something that is easily and quickly applicable in practice, something that gives a clear overview of what needs to happen, and providing the municipalities with the necessary tools to identify problems. This also shows the importance of keeping the assessment questions clear and understandable.

6. Discussion and conclusion

This section discusses the results and contributions of this research, the limitations of the research, and makes some suggestions for future research.

6.1 Results and contributions

Through creation of the method and the assessment the main research question *“How can small municipalities reduce IT related costs using Application Portfolio Rationalization?”* has been answered. Application Portfolio Rationalization is a way of reducing IT costs and reducing complexity in the Application Portfolio (Sarissamlis, 2006). By organizing their findings into an Application Portfolio Rationalization method the authors have provided a clear description of how small municipalities can rationalize their application portfolio. The assessment created based upon this method allows for quick and easy application of the method within municipalities, helping them achieve the desired result more efficiently. This assessment judges what points need focus for rationalizing the application portfolio after which it generates a small report describing what problems a municipality needs to focus on. Validation of the assessment has proven that it is a useful tool for municipalities.

The authors of this paper have shown that various problems lead to not being able to keep the application portfolio rationalized. The main problem, however, is not keeping a complete overview of the application portfolio, which leads to not knowing all the facts about applications and having no basis for rationalization or judging a change. Also not having centralized decision making regarding the application portfolio contributes largely in not succeeding to rationalize the application portfolio. Through creating a complete overview, and keeping it updated, as well as the proper handling of changes to the application portfolio it can be made sure that the application portfolio stays rationalized. By centralizing decision making regarding the application portfolio, standardizing the application portfolio as much as possible, and cooperating with other municipalities, optimization of the application portfolio can be achieved.

6.2 Research limitations, future research and conclusion

Some limitations to this research have been identified. It only contained a small number of case studies upon which the method and the assessment are based. This can be viewed as a limitation. Nevertheless, it can also be argued that small municipalities should be very similar, offering the mostly the same products and performing similar task, therefore making the results applicable to all small municipalities.

Also it could be argued that not the full spectrum of small municipalities containing 15,000 up to 40,000 inhabitants was researched, since the largest case study municipality contains only 29,000 inhabitants.

The validation of the assessment might also be considered limited, due to only two municipalities validating the method. However, these municipalities did each validate the assessment positively. It could be considered, though, that validation should also take place outside of the case study scope of this research.

Finally, no expert reviews were done of the actual method. Even though the key goal of the research is to make the method applicable in practice, this does offer limitations on the validity of the actual method.

The development of this method for small municipalities, as well as the assessment, provides an opportunity for municipalities to rationalize their application portfolio. However, future research should focus on whether this method is also applicable in all types of municipalities. Future research should also focus on validating and refining the method further. Finally, researchers can use the created method to make it applicable for other types of organizations. The assessment should then be adjusted accordingly.

This research has provided insight into relevant literature and methods considering Application Portfolio Rationalization. Several Application Portfolio Rationalization methods were discussed in creating a basis for the final research method that was created.

The authors of this paper have shown that many steps are necessary to fully rationalize the application portfolio of small municipalities and keeping that portfolio rationalized. However, it has been determined that the main problem of a non-rationalized portfolio can be traced back to two factors: the incompleteness/non-existence of an application overview, and lack of centralization of decision making about the application portfolio.

By using the provided Application Portfolio Rationalization method small municipalities can rationalize their Application Portfolio and as a result reduce their IT costs. By focusing on rationalization, optimization and the handling of changes to the portfolio all the tools necessary for keeping the portfolio rationalized. The by the authors provided assessment can be applied quickly and easily by small municipalities determine what their focus areas are for rationalization of the municipal application portfolio.

The method created adds to existing methods of Application Portfolio Rationalization. It provides more insight into how the application portfolio of small municipalities can be rationalized. Validation of the assessment made it clear that it is a useful tool in making the method applicable and understandable.

References

- Bird, G. (1998). The business benefit of standards. *StandardView*, 6(2), 76–80.
- Brynjolfsson, E. (1993). The productivity paradox of information technology. *Communications of the ACM*, 36(12), 67–77.
- Chen, T., Zhang, J., & Lai, K.-K. (2009). An integrated real options evaluating model for information technology projects under multiple risks. *International Journal of Project Management*, 27 (8), 776–786.
- Dahalin, Z. M., Razak, R. A., Ibrahim, H., Yusop, N. I., & Kasiran, M. (2010). An Enterprise Architecture Methodology for Business-IT Alignment: Adopter and Developer Perspectives. *Communications of the IBIMA*, 1–14.
- e-Overheid. (2008). *Architectuur en NORA*. Opgeroepen op 12 14, 2010, van e-Overheid: <http://www.e-overheid.nl/onderwerpen/architectuur-en-nora>
- Ernst & Young. (2011). *Bezuinigen op óf met ICT: Effectueren van potentieel in de publieke sector*. Den Haag: Ernst & Young.
- Fabrieck, M., Brinkkemper, S., & Dullemen van, J. (2007). A method for Application Portfolio Rationalization. *Digital Information Management, 2007. ICDIM '07. 2nd International Conference* (pp. 466–472). Lyon: ICDIM.
- Henderson, J., & Venkatraman, N. (1993). Strategic alignment: leveraging information technology for transforming organizations. *IBM Systems Journal*, 32(1), 4–16.
- IEEE. (2000). *IEEE Recommended Practice for Architectural Description of Software Intensive Systems*. New York, NY: IEEE Computer Society.
- Jonkers, H., Lankhorst, M. M., ter Doest, H. W., Arbab, F., Bosma, H., & Wieringa, R. J. (2006). Enterprise architecture: Management tool and blueprint for the organisation. *INFORMATION SYSTEMS FRONTIERS*, 8(2), 63–66.
- Marques Pereira, C., & Sousa, P. (2004). A Method to Define an Enterprise Architecture using the Zachman Framework. *Proceedings of the 2004 ACM symposium on Applied computing*. NY, USA: ACM New York.

- McKeen, J., & Smith, H. (2010). Developments in Practice XXXIV: Application Portfolio Management. *Communications of the Association for Information Systems*, 26(9), 157-170.
- Miles, R., Snow, C., Fjeldstad, Ø. M., & Lettl, C. (2010). Designing Organizations to Meet 21st-Century Opportunities and Challenges. *Organizational Dynamics*, 39(2), 93-103.
- Muller, G. (2010). *Architecting and Standardization*. Opgeroepen op 03 12, 2011, van Gaudi System Architecting: <http://www.gaudisite.nl/>
- Opengroup. (2003). *The Open Group*. Retrieved September 11, 2011, from TOGAF -- The Open Group Architecture Framework: <http://pubs.opengroup.org/architecture/togaf8-doc/arch/>
- Pugh, D. S., Hickson, D. J., Hinings, C. R., & Turner, C. (1968). Dimensions of organization structure. *Administrative Science Quarterly*, 13(1), 65-105.
- Sanders, N. (2007). An empirical study of the impact of e-business technologies on organizational collaboration and performance. *Journal of Operations Management*, 25(6), 1332-1347.
- Sarissamlis, S. (2006). *A sea of applications: portfolio rationalization*. Nautilus Research.
- Schreiber, B., Eckhardt, A., & Laumer, S. (2010). Between Cost Efficiency and Limited Innovation – A Scientometric Study of Business Process Standardization. *AMCIS 2010 PROCEEDINGS*. Americas Conference on Information Systems.
- Silvius, A. (2007). Aligning IT strategy to business strategy in a multi business company. *AMCIS 2007 Proceedings*. Denver : America's Conference on Information Systems (AMCIS).
- Simon, D., Fischbach, K., & Schoder, D. (2010). Application Portfolio Management—An Integrated Framework and a Software Tool Evaluation Approach. *Communications of the Association for Information Systems*, 26(3), 35-56.
- Vereniging van Nederlandse Gemeenten. (2011). *Kleine gemeenten: 15.000 - 40.000 inwoners*. Opgeroepen op 11 01, 2011, van Beleidsplan WMO: <http://www.beleidsplanwmo.nl/>
- Vogelezang, F. (2008). Portfolio Control – When the Numbers Really Count. *Lecture Notes in Computer Science*, 5338, 233-244.

Participatory Democracy in Europe

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Abstract. The aim of our study is to identify and describe how the participatory democracy instruments have been regulated by the law of certain states in Europe. These instruments have been designed in order to give the citizens the possibility to participate to the life of the City on a regular basis, not just every now and then, especially during the election. We will analyze in our study a set of instruments of participatory democracy, such as: the national referendum, the local referendum, the petitionary matters, the local councils, the consultative committees, and the e-democracy. All these instruments are successfully used in a number of states with consolidated democracies. Another chapter in the study is dedicated to the way in which local participative democracy works in Romania.

Keywords: participatory democracy, representative democracy, citizen, community, information, engagement, participation

1. From representative democracy to participatory democracy

Studies have shown a constant growing gap between politics and the citizen, but the idea to reunite them becomes more and more popular. Today's society has a large number of sides which democracy has gained in the course of its evolution. We are now talking about *representative democracy*, *deliberative democracy* and, last but not least, *participatory democracy*. Hanna Pitkin makes a distinction between two forms of representation: 1. "*standing for*" - *what a representative is* - and 2. "*action for*" - *what a representative does* - (Pitkin, H. 1967). Deliberative democracy can be defined as a form of government in which the legitimacy of a decision is based on a preliminary deliberation that should be attended by everyone who is subject of that decision.

The citizen is the leading actor in all these varieties of democracy, but in different degree levels and moments. If representative democracy calls for citizens to exercise their will once in 4 or 5 years in order to nominate their representatives for different assemblies (European Parliament, National Parliament, Presidentship, Local or county councils), within participatory democracy the citizen must permanently take action.

There are several questions regarding the capacity of traditional political institutions to cope with the challenges raised by contemporary society. There have been identified 3 types of crisis in the doctrine:

- *the crisis of political authority* – what chances are that the State could prevail over the monopoly of defining the general interest? How could legitimate decisions be made within a context of generalised impugment? How could we take into account, within a public action framework, the development of competence and education level of the average citizen?
- *the crisis of democratic participation* – how could we reconcile the democratic ideal with the acknowledgement of unequal access of different social groups to different places of making decisions? How could we reduce the consequences of social fragile groups (young people, unemployed workers etc.) showing political uninvolvedness? How could we make sure the political interests of these groups are represented since we notice a decrease in the role played by the organisations which traditionally represented them (trade unions, political parties)?
- *the crisis of public deliberation* – to what extent mass-media is nowadays capable of offering the necessary space for a solid, well-documented, contradictory debate? To what extent mass-media allows all the opinions to be aired? To what extent the Parliament still plays the role of core deliberative resort? To what extent the gallup polls can be regarded as the expression of a genuine public opinion? (Blondiaux, L., 2007).

A large number of questions we need to find answers to by the agency of participatory democracy too. Participatory democracy is a new type of democracy which allows its citizens to actively play a part within a decision-making process. It is a complementary form of representative democracy, giving its citizens the opportunity to bring a contribution to the local social life. Participatory democracy seeks

to institutionalize the citizens participation to public affairs in other forms, not just appointing the elected ones. We have to point out that these forms are not intended as substitutes. They complement the classic representative institutions. All the instruments of the participatory democracy appear as spaces where a legitimate public decision could prevail, where the contradictory opinions could be reconciliated, with talking points coming from all sides, but where the power of decision is not directly involved.

Participatory democracy should improve the act of governing by means of building synergies for reflection and collective action between governants and civil society. Its target is to support the participants through developing their ability to be a citizen, as well as their attitude to bear in mind the general interest.

The concept of citizen participation is based on the necessity to hold counsel with the citizens as well as on exercising their opinions on the decisions that are being adopted at different levels, decisions which can directly or indirectly affect them. Within a healthy community, the citizens make contribution to public interest decision-making, gather information about the problems that concern them, ask the authorities to adopt the appropriate measures and effectively implement the decisions that have been taken (Murgescu, D. and Dumitrică, C. 2009:38).

Since citizen participation is a relatively new concept in the European framework, the initiative of the process should fall on the local representatives at first. That means a strong engagement of the local leaders (both representatives of deliberative assemblies or local executive) towards the citizen participation in the community life. The local public administration should be opened to the participation of all citizens as part of the community and to their needs to build local public policies and to implement them.

Participatory democracy implies information, communication and engagement within the relationship between administration and citizens.

2. Models of good practice: France, Spain and Switzerland

2.1 Instruments and actors of local participatory democracy by the French legislation

The concept of *local democracy* emerged for the first time within the *Law of 6 February 1992 regarding the Republic territorial administration*. This law tries to amend the information and participation of citizens, as well as to strengthen the right of the elected ones within the local assemblies. The law appoints the consultative committees of local public services, which enable the public services users to express their opinion on them. The Law of 27 February 2002 regarding democracy of proximity is an important text for strengthening the participatory democracy. The aim of this law was to enable a better citizen partnership while making decisions at local level, thus strengthening the participatory democracy and the rights of opposition within deliberative assemblies.

This law enabled the insertion of a set of instruments designed for the citizen so that he could be closer to the political decision. Thus, in communes of at least 80.000 inhabitants, the municipal council is the one that sets the borders of that particular commune. Each neighborhood has a *neighborhood council*. These neighborhood councils can be consulted by the mayor and they can make suggestions regarding the life of the neighborhood. The mayor can associate them in the process of developing, implementing and assessing the operations that have regard to the neighborhood.

Another innovation put forth by this law is the emergence of *consultative committees*. The municipal council can create consultative committees on any issue regarding the communal interest, covering the entire area or just parts of it. These committees can be made of persons outside the council, but representatives of local associations. Each committee is chaired by a member of the municipal council, appointed by the mayor. The committees can be consulted by the mayor on any aspect or project regarding the public services and the proximity equipments, and which make the object of activity of committee associations.

The law regarding the democracy of proximity has turned the National Committee for Public Debate set out in the Barnier law of 1995, into an independent administrative authority and enlarged its area of expertise.

Local consultancy is another major element of the French participatory democracy.

The present legislation brings under regulation the citizen consultancy both at communal and intercommunal level. The deliberative organ or even the citizens can have the initiative of consultancy.

The commune inhabitants have the right to be informed of its business and to be consulted on the decisions that concerns them. This is an essential principle of local democracy.

The citizens of a territorial collectivity can be consulted regarding the authorities decisions in that collectivity. As far as the citizens initiative is concerned, the law provides that 1 out of 5 or 1 out of 10 electors registered on a check list in a commune can ask consultancy regarding an issue that makes the object of a decision to be made by a deliberative assembly. The deliberative assembly of that territorial collectivity makes the decision of setting up a consultancy. An elector is allowed to put his signature only on one petition regarding the set up of a consultancy a year.

The constitutional law of 28 March 2003 regarding the decentralised organisation of the Republic established some other consultancy procedures at the initiative of national authorities. The law enacts two situations when the consultancy process emerges: 1. the setup of a *territorial collectivity with special status* and 2. *the status of overseas collectivities*.

According to Art. 72-1 of the Constitution, the law establishes the terms within the electors in each territorial collectivity, by means of exercising their *petitionary right*, can add propositions on their local deliberative assembly's meeting agenda. The projects or the acts which lie within a territorial collectivity's attributions can be submitted to a popular vote following the initiative of that collectivity. Whenever the intention is to setup a territorial collectivity with special status or to change its organisational structure, the law enables the electors registered on the check list and living in the interested collectivities to be consulted. The electors can be consulted on the alteration of territorial collectivities boundaries within the terms established by the law.

Regarding the overseas collectivities, the aim of consultancy is to get the consent of those interested in changing the status of their collectivity. Changing the status of collectivity makes the object of national authorities decisions, but they can not proceed without having the consent of the electors in that particular collectivity. No alteration, fully or partially, of a collectivity mentioned in Art. 72-3 indent 2 of the Constitution, of one or other status stipulated for these collectivities by Art. 73 and Art. 74 of the Constitution, can not be made without the consent of all or part of electors in that collectivity. The President of the Republic, at the suggestion of the Government during the parliamentary session or at the suggestion of the two Chambers, can make the decision to consult the electors in overseas territorial collectivity regarding the aspect of its organization, its competences or the legislative framework.

According to Art. 73 indent 7 of the Constitution, there can not be created, by means of law, a collectivity aiming to replace a department or an overseas region; and there can not be appointed a single deliberative assembly for these two collectivities unless there is no consent from the electors registered on the check lists of those collectivities, according to Art. 72-4 of the Constitution. This procedure had been applied in Guadalupe and Martinica.

The local referendum – is another instrument of participatory democracy brought under regulation by the French legislation. The area of this instrument has been expanded in the French system through the Constitutional law of 28 March 2003, which appointed the decisional referendum by means of the organic law of 1 August 2003, the law of 13 August 2004 and the decision of 4 May 2005.

The local referendum enables the electorate to substitute the municipal council in order to make a decision regarding a communal matter. This type of popular consultancy emerges before the deliberative assembly could make a decision regarding the issue submitted to referendum. The decisional character of referendum is nevertheless depending on the attendance degree of electors. The deliberative assembly of a territorial collectivity can submit to local referendum any decisional act regarding the regulation of a matter that lies within that collectivity's competence. The executive of a territorial collectivity can suggest all by himself to the deliberative assembly of that collectivity the submission to a local referendum of any act that lies within the duties exercised on behalf of the

collectivity, apart from the individual acts. The mayor is the one in charged with the election. A local collectivity can not organize several referendums with the same purpose in less than one year. The project submitted to local referendum is enacted if at least half of the electors registered on the check lists attend the referendum and the project meets the majority of votes.

Participatory democracy doesn't only mean to consult with the people, but also to get the people involved in making a decision. The French territorial collectivities have developed a set of instruments related to democracy of proximity aiming to actively get the French citizens involved in making decisions that concern them. In order to illustrate the above mentioned facts, we will highlight a few instruments used by several territorial collectivities.

In the city of Lyon there are 34 neighborhood councils, with the main target to make the public action more effective and to find solutions for the problems the city is dealing with.

Another instrument is the *extra-municipal councils*, that gather together both counselors of arrondissements and persons outside the Council, appointed in service by their competences. Their duties change from one arrondissement to another. The city also has a Committee for Initiative and Consultancy of Arrondissement (C.I.C.A.), that reunites the representatives of associations exercising activities within the arrondissement. The members of the Committee associations can bring up any problem related to their field of activity and submit any proposal to the Arrondissement Council.

The local interest committees are neighborhood committees, and have been founded at the end of the 19th century. They are areas for dialogue and information. They protect the citizens' right to attend: the urban blueprint, the salvation, valorization and promotion of the urban heritage. These committees are rightful members of C.I.C.A. and attend the neighborhood councils. There is also a Consultative Committee for the Users of Local Public Services and a Developing Council of Grand Lyon, aiming to associate the civil society in order to draw up the strategy for urban agglomeration and the communitarian public policies. In order to properly inform the citizens of all the aspects that concern them, the city of Lyon has its own monthly newspaper - **Lyon-Citoyen**.

In the Region Rhône-Alpes, the regional Council issued a set of instruments of participatory democracy aiming to actively get the citizens involved in the life of community itself, in making decisions at regional level. Here are some of these instruments: 1. *The citizens workshops* – these are innovative instruments for developing the participatory democracy in Rhône-Alpes. They are made of citizens chosen at random out of a representative group. Their role is to provide a documented and forensic notification, aiming to clarify the elected ones; 2. *The public reunions* – organized on a cyclical basis by the Regional Council in order to enable the citizens to express their views concerning the problems of the region.

The authorities in Lille describe the city as the city of dialogue, participation and citizenship. Lille is one of the first cities in France that founded the neighborhood councils ever since 1978. Participatory democracy in Lille is based on three levels:

- territorial proximity;
- consultancy;
- direct dialogue with the inhabitants.

Although the French law regulates a large number of instruments in order for the citizens to actively get involved in the process-making, these tools are barely used. Regarding the *local consultancy*, set up by the communes between 1995-2009, one can notice that this instrument of direct democracy has been used only 233 times (this is quite a small number comparing to the large number of communes).

Concerning the *neighborhood councils*, one can notice an evolution over the years. Thus, in 2002 there were only 292 councils, in 2003 the number went to 982, while in 2005 there were 1305. Within the context of general renewal of the municipal councils in march 2008, according to the numbers aired by prefectures, in 2009 there were 1552 neighborhood councils. The role of neighborhood councils is nothing but consultative. The mayor is the one who decides whether they are to be consulted or not on issues related to community's problems or the policy of the city.

The referendum as an instrument of direct democracy was not too often used within the French system. Since the French 5th Republic has been introduced, nine referendums have been organised. They aimed both the institutional organisation of the state (the adoption of the Constitution of 1958, the election of the President by means of direct vote, the reduction of the presidential mandate) and European matters (the process of ratifying the Treaty of Maastricht etc.). The referendum was rather an opportunity for the French citizens to show their dissatisfaction over the political decisions. We are talking about the negative vote („objection vote”) given by the French in 2003 regarding the proposal for changing the institutional organisation of Corsica, or the vote against the project for an European Constitution. In order to approach the citizens, the political decisions makers want to use the referendum so they could legitimate their future political actions. Even the President of France, Nicolas Sarkozy, intended to do so. During the 2012 presidential election campaign, he suggested the organisation of referendums on a series of fundamental reforms concerning the unemployment allowance and the rights of foreigners. This proposal has been attacked both by his political opponents and the civil society.

2.2 The citizen participation in Spain

Due to a complex administrative-territorial organization, Spain developed a mechanism for the active participation of citizens in the life of their local community. The Constitution of Spain itself, in Section 9.2, states: It is the responsibility of the public authorities to promote conditions ensuring that freedom and equality of individuals and of the groups to which they belong are real and effective, to remove the obstacles preventing or hindering their full enjoyment, and *to facilitate the participation of all citizens in political, economic, cultural and social life.*

The Law no. 7/1985 regarding the Keys of the Local Regime, in Title V, Chapter IV, Art 70 bis, encourages the actual participation of citizens in the public life and issues as an instrument the right to popular initiative in areas that fall under the municipality's competence. Art. 70 bis 3 states that it is the responsibility of the local authorities, municipalities in particular, to impel the interactive employment of modern information and communication technologies in order to facilitate the participation and communication with the rest of territorial collectivities, with respect to the presentation of documents and the administrative procedures carry out, the presentation of polls or the inquiry of citizens.

The participation of the Spanish citizens to their community life is also an area of interest for The Executive Commission of the Spanish Federation of Municipalities and Provinces – FEMP. The Area of Citizen Participation and Governance principally aims to give impulse to developing policies that favour citizen involvement in the preparation and implementation of the public measures of Local Governments. To achieve this, work shall be done on preparing measures oriented towards providing Local Corporations with instruments that can help in framing the municipal policy of participation on which to develop the policies specific to each territorial or sectoral sphere. Another important document that regulates the rights of Spanish citizens while getting involved in their community life is the Organic Regulations regarding the citizen's participation, issued by the Executive Commission of the FEMP in 2005. There are regulated in this document the right to information, the right to assemble, the right to associate, the right to petition, the right to intervene in a municipal public meeting, the right to be consulted on community problems by means of referendum.

We have to point out that most of the Statutes of Autonomy of the Autonomous communities of Spain have included norms regarding the participatory democracy (for instance: Section 9. 4 of the Community Status of Valencia states: *all the citizens of Valencia have the right to individually or collectively participate in the political, economic, social and cultural life of Valencia. The municipality of Valencia will promote the participation of the social partners and civil society to public affairs.* The Autonomous Community of Valencia enacted the Law no. 11/2008 regarding the citizens participation, where it pointed out the important role played by the citizens' commitment to the life of community. The head note of the law states that the participation of citizens meets a sustained need for dialogue between the citizens and the political institutions. The participation is also similar to dialogue, communication and pluralism.

In Spain, there are used as instruments of citizenship participation and public debate (audiencia ciudadana) the citizen panels (paneles ciudadanos), the boards of citizens (jurados ciudadanos), the opinion surveys (sondeos de opinión) etc.

2.3 The citizen participation in Switzerland

Switzerland appears to be an exception to the rule concerning the use of referendum as a tool of direct democracy. There are significant differences between the referendum in Switzerland and other states. In Switzerland, the referendum is a solemn event, when the leaders move towards the people. It is an ordinary point in the political life of the state, which takes place once in three or six months and aims a large number of matters. (Hamon, F. and Passelecq, O. 2001). Switzerland developed a democratic system which serves for more than two centuries. Another instrument used on a large scale in Switzerland is the *popular initiative*, that emerged in 1848, but only in 1891 had this instrument been put into practice. There are quite a small number of countries where the citizens get so actively involved in the life of the state and Switzerland is one of them. The current manifestation of direct democracy has been encouraged by a series of parameters, such as: a high degree of education, a small number of people and a generous media offer. The Swiss constituent regulated within the Federal Constitution, Title IV – *The people and the cantons*, Chapter 2 – *The initiative and the referendum*, the two instruments of direct democracy: *the popular initiative* and *the types of referendum*.

Any 100,000 persons eligible to vote may within 18 months of the official publication of their initiative propose a complete revision of the Federal Constitution. This proposal must be submitted to a vote of the People.

An initiative in the form of a specific draft shall be submitted to the vote of the People and the Cantons. The Federal Assembly shall recommend whether the initiative should be adopted or rejected. It may submit a counter-proposal to the initiative. The People shall vote on the initiative and the counter-proposal at the same time. The People may vote in favor of both proposals (the system of “double YES”).

According to Art. 140 of the Federal Constitution, the following must be put to the vote of the People and the Cantons: a) amendments to the Federal Constitution; b) accession to organisations for collective security or to supranational communities; c) emergency federal acts that are not based on a provision of the Constitution and whose term of validity exceeds one year; such federal acts must be put to the vote within one year of being passed by the Federal Assembly. The result of a popular vote in a Canton shall determine the vote of the Canton.

According to Art. 140, Indent 2 of the Fundamental Law, the following shall be submitted to a vote of the People: a) popular initiatives for a complete revision of the Federal Constitution; b) popular initiatives for a partial revision of the Federal Constitution in the form of a general proposal that have been rejected by the Federal Assembly; c) the question of whether a complete revision of the Federal Constitution should be carried out, in the event that there is disagreement between the two.

According to Art. 141 of the Constitution of Switzerland, if within 100 days of the official publication of the enactment any 50,000 persons eligible to vote or any eight Cantons request it, the following shall be submitted to a vote of the People: a) federal acts; b) emergency federal acts whose term of validity exceeds one year; c) federal decrees, provided the Constitution or an act so requires; d) international treaties (that: 1. are of unlimited duration and may not be terminated; 2. provide for accession to an international organisation; 3. contain important legislative provisions or whose implementation requires the enactment of federal legislation).

Regarding the popular initiative, between 1893 – February 2012:

- 289 popular initiatives - meet the conditions to be submitted to a vote;
- 4 popular initiatives – were declared invalid;
- 175 popular initiatives – were subject to vote;
- 18 popular initiatives – were accepted by the people and cantons.

Most of these initiatives got less than 50% of votes and were thus rejected. Nevertheless, the embedded proposals triggered intense debates, and have been partially incorporated within laws afterwards. The number of requests for *optional referendum* got larger in time. During the 60's there were only 8 requests, during the 70's there were 17, and between 1991-2000 there were 36 requests. Between 2001-2010, 28 matters were submitted to vote. Using these two instruments of participatory democracy on a regular basis: *the referendum* and *the popular initiative*, but also *the petition*, the

Swiss citizens turn out to be extremely involved within the life of society. On the occasion of referendums, the Swiss citizens expressed their opinion on delicate matters and of crucial importance for the community they live in (let's take, for instance, the federal popular initiative regarding the expel of foreign law breakers – 2010, the federal popular initiative against the establishment of minarets across Switzerland – 2009 etc.). Still we have to mention that using these instruments on such a regular basis in Switzerland was possible due to the fact that these consultations aim a small number of citizens, and the state benefits from financial and logistic resources that enables it to set up in good conditions each popular consultation. The event is also a tradition and a specific feature of the Helvetic Confederation.

3. Participatory democracy in Romania, at the beginning of life

In Romania, the concept of participatory democracy is up till now just a speech topic for the governants and a desideratum for the citizens. Romania is in the red when talking about participatory democracy. Except for the referendum (national and local) – an instrument belonging to direct democracy and popular initiative (the legislative initiative – Art. 74 of the Constitution and the review initiative of the Constitution – Art. 150 of the Constitution), the legislation doesn't regulates other instruments which can be used by the citizens to get involved in decision-making in order to improve their lives. The Romanian citizens have little information on the decisions, projects and financial resources of the community they live in. Free of certain decisions made by some deliberative or executive authorities in Romania, the legislator itself should come up with proposals aiming to start the implementation in Romania of the participatory democracy instruments used by the states with consolidated democracies and with much more expertise in public administration.

Another matter of major interest for the community is the creation of the community's budget. For this purpose, the citizens of the community should be informed about the way in which the local budget is funded, thus being aware of the existing financial difficulties and opportunities.

Within a public debate, meeting or hearing, the citizens must be given the chance to put forth some amendments that can be taken into account by the people in charge with the local budget enactment.

From our perspective, by the agency of opinion surveys, interviews, focus groups, public meetings and other techniques for citizen participation, Romanian authorities should learn how to collect and use the citizens' opinions regarding the way in which all types of public services should be delivered. Furthermore, the authorities should encourage the citizens to attend the meetings of representative forums (ie. the local or county councils), thus being able to get in contact with the local problems, as well as with the decision-making procedures. Even though the meetings of the Romanian local or county councils are public, the citizens in Romania showed little or no interest in attending these meetings. All the governants talk in their speeches about getting the administration closer to the citizen. But this seems to remain just a desideratum in a political speech.

Here are some reasons why the Romanian citizens refuse to get involve in the life of their community:

- *lack of motivation* – studies regarding the citizen's involvement degree in the life of their community have shown that citizens need motivation in order to get involved. This motivation might be related to promoting the individuals who commit themselves to solve a public interest problem or an issue concerning material benefits. The more an action designed to improve the process of making public policies includes a motivational offer, the higher are the chances to attract a large number of citizens and more sustainable and positive solutions.
- *lack of technical knowledge* regarding the topics up for debate.
- *lack of a democratic exercise* when talking about the involvement of the community in its problems.

The participation of citizens as volunteer representatives in various workgroups (Murgescu, D. and Dumitrică, C. 2009:41), can render the administration efforts to achieve its responsibilities towards the citizens in a clear and effective way. The solidarity of community towards the local challenges will be much stronger due to the citizens presence within such structures.

Romania is not ready at the moment for this new type of democracy – *participatory democracy*. It takes time and better communication between the actors of community because both sides can benefit from this type of democracy: the *elected ones* will enjoy a more effective governance, while the *community* will enjoy a better life.

3. Conclusions

The topic of participatory democracy is extremely attractive both for the politicians and citizens. It can not be depleted in a matter of just a few pages. But we can draw several conclusions and put forth some solutions based on what we have previously mentioned. It's important to find an answer to the following questions:

How can we make the citizens feel they are being represented at micro-local level by other citizens, in which they recognize themselves better than in their classic political representatives?

The nowadays participatory democracy is getting institutionalized, thus leading to the emergence of new actors, new forms of legitimacy, new instruments of getting the citizens involved in decision-making.

Participatory democracy doesn't mean only consult with the population, but the actual participation of citizens to making-decision. The partnership between administration and citizen also depends on the way the citizens have access to that information that influences their lives. Citizens should be involved in the process of making and enacting the local public policies, as well as in appointing the primary domains for intervention.

What would be the idyllic version of participatory democracy? Could it be the Greek Agora, where each citizen could come and freely express, or we can implement instruments and facilities designed to help the citizen to get involved in the public life beyond the singular moment of formal voting?

From our perspective, both of these types are sustainable, that is the public manifestation within the frame of periodic and well organized assemblies, and the regulation of some instruments for citizen active participation. The citizen participation, although essential within a democracy, is not always easy to carry out. It takes political will, perseverance and a certain feel for teaching both the authorities and the citizens what are their responsibilities within a democracy.

Citizen participation doesn't have to limit itself only to expressing the formal voting. The shift of competences towards the elected while voting doesn't have to take from the citizen his responsibilities as a sovereign. What does the word „democracy” mean after all?

Within an Europe where more and more people talk about a democratic deficit, one must create effective not just formal instruments, so the citizens could actively get involved in the life of their community and, why not, for the European Union states, to take part in the political decisions of European institutions.

The Treaty of Lisbon thus defines for the first time the democratic fundamentals of the Union, based on three principles: *the principle of democratic equality, the principle of representative democracy and the principle of participatory democracy*. Concerning the *principle of participatory democracy*, the treaty acknowledges two forms of participatory democracy: the citizens as members of a new type of people and the organised civil society. „*The institutions shall, by appropriate means, give citizens and representative associations the opportunity to make known and publicly exchange their views in all areas of Union action*” (Art. 11 TEU). The treaty invites, at the same time, the citizens to attend the Union's policies through the agency of citizens' initiative. According to it, one million citizens who are nationals of several Member States may take the initiative of inviting the European Commission to submit any appropriate proposal on matters of a legal act in areas that fall under the Union's competence.

In the current context, a new source of legitimacy is required, designed to update the bond between the European Union and its citizens, and the starting point should be the development of a European public sphere – prerequisite for the actual participation of all the citizens. One resolution that might be taken into consideration is based on an initiative of the European Parliament, aiming to bestow rights on the Union's citizens (Hix, S. 2008: 50-51), that is to submit a new kind of political practice: The European Citizens' Consultation for General Interest (ECCGI), established in all the EU countries at the same time and designed to comprise accurate information on the strategic orientations across the Union.

Participatory democracy implies a constant partnership between the elected and the electors. The citizen, in his various aspects, whether he is elected or elector, must set himself the target to be public-spirited.

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References

- Bacqué, M.-H., Rey, H and Sintomer Y.(2005) *Gestion de proximité et démocratie participative : les nouveaux paradigmes de l'action publique ?* La Découverte, Paris.
- Hamon, F. and Passelecq O. (2001) *Le référendum en Europe: bilan et perspective*, Harmattan, Paris.
- Hix, S. (2008) *What's Wrong with the European Union and How to Fix It*, Cambridge and Malden, MA: Polity Press.
- Lijphart, A. (1999) *Patterns of Democracy. Government Forms and Performance in Thirty-Six Countries*, Yale University Press.
- Qvortrup, M. (2005) *A comparative study of referendums. Government By the People*, Manchester Univerity Press, Manchester.
- Pitkin, H. (1967) *The Concept of Representation*, University of California Press, Berkeley.
- Blondiaux, L. (2001), "Démocratie locale et participation citoyenne: la promesse et le piège" [Online], Available: <http://www.cairn.info/revue-mouvements-2001-5-page-44.htm>, [accessed on 3/january/ 2012]
- Blondiaux, L. (2007), "La démocratie participative, sous conditions et malgré tout. Un plaidoyer paradoxal en faveur de l'innovation démocratique" [Online], Available: http://www.adels.org/edition/Blondiaux_Mouvements_07.pdf. [accessed on 3/ january/2012].
- Hamon, F. (2007) „*Le referendum*”, Documents d'etudes, n° 1.21, La Documentation Française, Paris.
- Murgescu, D. and Dumitrică, C. (2009) „*Participarea cetățenească – mijloc de implicare a cetățeanului în procesul decizional*”, Sfera Politicii, No. 136, pp. 38-41.
- http://www.dgcl.interieur.gouv.fr/sections/les_collectivites_te/vie_democratique_loc/democratie_de_proxim/conseils_de_quartier/ [accessed on 7/ january/2012].
- http://www.lyon.fr/vdl/sections/fr/vie_democratique/democratie_de_proxim [accessed on 10/ january/2012].
- <http://www.rhonealpes.fr/95-democratie-participative-rhone-alpes.htm> [accessed on 10/ january/2012].
- http://www.mairie-lille.fr/fr/Citoyennete_-_Concertation/conseil-lillois [accessed on 10/ january/2012].
- http://www.dgcl.interieur.gouv.fr/sections/les_collectivites_te/vie_democratique_loc/democratie_de_proxim/consultation/ [accessed on 5/ march/2012].
- http://www.admin.ch/ch/f/pore/vi/vis_2_2_5_8.html [accessed on 4/march2012].

Permanent Establishment: Up in the Clouds?

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Abstract: Permanent Establishment (PE) is the bedrock of all Double Taxation Treaties. These treaties state that a foreign entity within a country can only be taxed on its profits once it is a PE. The rules governing a PE are contained within Article 5 of the OECD Model Treaty. The rise of e-commerce in the 1990s put pressure on the OECD to modernise and update these rules (which originated from a draft convention by the League of Nations in the 1920s). The Ottawa meeting of 1998 decided that in certain instances, a server could be a PE. The paper will re-examine the server as a PE from differing perspectives: the most recent OECD commentary; relevant case law; individual countries viewpoints and Double Taxation Treaties. Within this research, the writer examines the OECD's viewpoint of e-commerce and a server by examining emerging ICT technologies specifically, cloud computing. It then examines the potential impact of cloud computing on a PE by interviewing four experts covering the fields of taxation, law and ICT. The paper concludes that the concept of a PE is out-dated in the modern world and requires a major overhaul, and potentially a replacement.

Keywords: permanent establishment, web-server, OECD model treaty, double taxation treaties, cloud computing

1. Introduction and background

The aim of this paper is to examine the OECD's definition of a Permanent Establishment ("PE"), as laid out in Article 5 of the OECD Model Tax Convention on Income and Capital (hereinafter Model Treaty), and re-evaluate it's continuing relevance in the context of the recent technological evolution of cloud computing. The importance of the PE concept cannot be understated. If a foreign corporation is operating a business within another country – that host country will only have taxing rights on the corporation's business profits if it is deemed to be operating a PE. If e-commerce operations (specifically a server and/or a website) situated in a source country can constitute a PE (OECD, 2010a: p.110), what effect will recent advances in the Information and Communications Technology ("ICT") sector (cloud computing) have on the OECD definition of a PE? Is it possible that ICT has such an effect that the very concept of a PE should be re-examined or even replaced/abolished?

2. What is a PE?

A PE is defined in the seven paragraphs of Article 5 of the OECD Model treaty. Article 5(1) provides a definition of a PE as a *"fixed place of business through which the business of an enterprise is wholly or partly carried on"* (OECD 2010a). Article 5(2) provides further elaboration extending the definition to *"a place of management; a branch; an office; a factory; a workshop, and a mine, an oil or gas well, a quarry or any other place of extraction of natural resources"*. Article 5(3) places a time limit as to how long a construction site must be in existence to be considered a PE (twelve months). Article 5(4) specifically mentions what cannot be a PE, for example, activities that are preparatory or auxiliary to a business (Article 5, paragraph 4, Subparagraphs a) through f) provides the full list).

The previous paragraph describes a fixed place PE, but there is another form of PE - an agency PE. This is described within Article 5(5) and confirms that *"persons"* (rather than a fixed place of business), who have the authority to conclude contracts on behalf of foreign enterprises, are deemed to be a PE of the foreign enterprise. Following on from this in paragraph six, an agent acting as a broker; commissionaire or any other independent agent is not a PE. Article 5(7) concludes that a subsidiary of a parent company in another contracting state does not automatically make the subsidiary a PE of the parent company.

The commentary within the Model Convention notes that there are three related conditions required for a PE (OECD, 2010a: p. 92): The existence of a *"place of business"*, i.e., a facility such as premises or, in certain instances, machinery or equipment; this place of business must be *"fixed"*, i.e., it must be established at a distinct place with a certain degree of permanence; and *"the carrying on of a business of the enterprise through this fixed place of business"*. Unlike a PE, which is copper fastened within the Model Treaty, there is no equivalent formal definition of what cloud computing is. A search

on the Internet will provide many definitions. Table 1 below provides definitions by four internationally renowned analyst firms. However they fall into the common mistake by giving a definition from the perspective of the end user (Stanoevska-Slabeva and Wozniak 2010: p.48). They concentrate on the service being provided by cloud computing. From an end-users perspective, this is perfectly adequate as they (the customer) are not concerned nor do they need to know how the cloud works – just that it does and it is present. However, in the context of this paper, it is not helpful because as will be shown later, the technology behind cloud computing and its relevance to a PE is a key issue.

From a technological point of view, cloud computing comes from virtualization technology which allows individual servers to act as though they are multiple resources (known as virtual machines). The virtual machine executes the software on behalf of the end-user and virtualisation allows the virtual machine to move from one physical server to another so that each physical server is treated as if it is one single machine – the “cloud” (IT-Tude.com, 2011). The U.S. Department of Commerce’s National Institute of Standards and Technology (NIST) (Mell and Grance, 2011) describes the cloud-computing model as one that enables “ubiquitous, convenient, on-demand network access to a shared pool of configurable resources” that can be rapidly utilised and released with minimum interaction. Two key features to note about cloud computing is virtualisation and scalability (Stanoevska-Slabeva and Wozniak, 2010: p.49).

Table 1: Selected analyst firms defining Cloud Computing

Source	Definition
Gartner	“a style of computing in which massively scalable IT-related capabilities are provided “as a service” using Internet Technologies to multiple customers”
IDC	“an emerging IT development, deployment and delivery model, enabling real-time delivery of products, services and solutions over the Internet (i.e. enabling cloud services)”
The 451 Group	“a service model that combines a general organising principle for IT delivery, infrastructure components, an architectural approach and an economic model – basically, a confluence of grid computing, virtualization, utility computing, hosting and software as a service (SaaS)
Merrill Lynch	“the idea of delivering personal (e.g. email, word processing, presentations.) and business productivity applications (e.g. sales force automation, customer service, accounting) from centralised servers”

(Stanoevska-Slabeva and Wozniak 2010: Table 4.1, p.48)

The concept of cloud computing can be illustrated as follows:

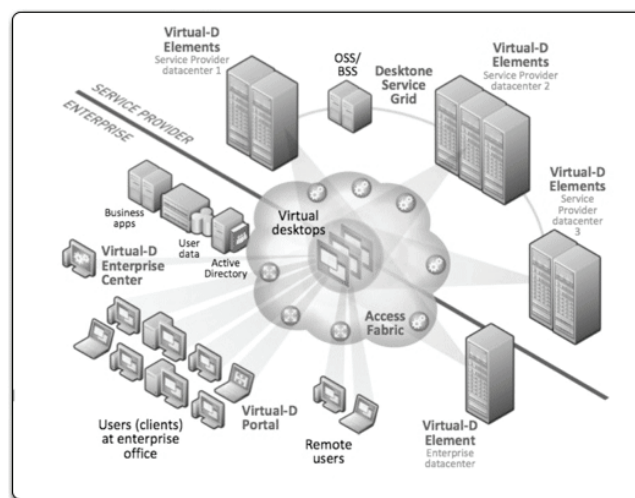


Figure 1: The concept of cloud computing

2.1 Permanent establishments and profit

Article 7(1) of the OECD Model Treaty states that

'Profits of an enterprise of a Contracting State shall be taxable only in that State unless the enterprise carries on business in the other Contracting State through a permanent establishment situated therein'

(OECD 2010a, p. 26)

This means that the rights to tax the profits of a foreign-based enterprise are only possible, within the context of the Model Treaty, when that enterprise's economic activity is deemed to be a PE in the country in which the activity is undertaken. The arm's length criterion is then applied to determine the level of profits that the PE would be expected to make as *"if it had been operating as a distinct and separate enterprise."* (Vogel, 1997: p. 426). This gets more complex if the PE concerned is a server and even more so in the virtual world of cloud computing.

3. Literature review

3.1 The origin of permanent establishment

The concept of a PE dates back to the latter end of the nineteenth century where a significant milestone was reached in the Double Taxation Agreement between Austria and Prussia, which assigned exclusive taxation to the state of residence, as long as the taxpayer did not maintain a PE in the source state (Reimer et al, 2011). There followed further commentary and work by the League of Nations in 1927, followed by various model conventions by the United Nations, which further refined the definition of a PE (Choudhary, 2011: p.42). Much work followed in the 1950s and 1960s by the OEEC (Organisation for European Economic Co-operation) and it was in 1963 that the OECD first introduced its Model Treaty. The definition of a PE has remained relatively unchanged since that first Model Treaty.

3.2 OECD commentary

The OECD commentary amended its interpretation on the building blocks that constitutes a PE, specifically in regard to the three conditions required: place of business, that is fixed and that a business is being carried on. The rising tide of e-commerce meant that the OECD needed to incorporate the taxation of e-commerce within their model treaties. And for very prescient reasons too, total consumer e-commerce sales globally are estimated at €591 million, an increase of close to 25%.

This led to the landmark meeting held in Ottawa in 1998 (Collins, 2009 and OECD, 2001). This meeting provided a greater certainty for the OECD and its members' Revenue Authorities in how to tax new transactions emanating from the rising tide of e-commerce. The outcome was that taxation principles from conventional commerce should guide their way for taxing e-commerce and that there should be a fair share of the tax base between countries avoiding *"double and unintentional non-taxation"* (OECD, 2001: p. 11). They examined the concept of websites and web servers and concluded that a server, once wholly owned and operated by the enterprise could constitute a PE of the enterprise *"if the other requirements of the Article are met"* (OECD, 2001: p. 83). Crucially, they did see a distinction between the server and the actual website that facilitates an e-commerce sale. They decided that:

"...that a web-site cannot, in itself, constitute a permanent establishment, that a web-site hosting arrangement typically does not result in permanent establishment for the enterprise that carries on business through that web-site and that an ISP will not, except in very unusual circumstances, constitute a dependant agent of another enterprise so as to constitute a permanent establishment of that enterprise"

(OECD, 2001: p. 80)

The OECD (2001) decided that there was a difference between the physical tangible structure of the server and the intangible nature that is a website, which is software running on the server. The OECD also decided that a physical presence was not required *"human intervention is not a requirement for the existence of a permanent establishment"*(p. 81). Furthermore, the commentary also concluded that computer equipment at a particular location could be construed as a PE but that this depended on whether the equipment were of a preparatory or auxiliary nature. This however, could only be settled on a case-by-case analysis. The 2001 commentary concluded with examples of

preparatory/auxiliary services: including providing a communications link; advertising; relaying of information through mirrored sites; gathering market information and supplying of information and also stated that if these aforementioned services were the core (i.e. not preparatory) business of a company, then they could also be considered to be a PE if the equipment constituted a fixed place of business.

4. An academic's viewpoint

4.1 Websites and web servers

"E-commerce dissolves most physical nexus"

(Basu, 2007: p 118)

A website is not a physical entity but Basu (2007) takes an alternate view of the website and attempts to humanise it. He examines Articles 5(5) and 5(6) of the Model Treaty (OECD 2010a) to see if a web site could constitute a person under Article 3 of the Model Treaty and so could therefore be considered a dependant agent within Article 5 (Basu, 2007). The rationale behind Basu's argument is that the OECD commentary relating to Article 3 does not specifically refer to a web site under its definition of a "person". A website would be considered a person and so therefore it could not be considered a dependant agent, meaning that the website could not be considered a PE.

Basu (2007) continues with his argument by stating that web sites are becoming increasingly more intelligent and that the definition of a "person" under Article 3 gives scope on a more liberal interpretation. There are many examples of web sites today that carry out many automated tasks, for example, email campaigns based on previous purchases or to potential new customers based on a sister web site. The web site is performing tasks based on the instructions given to it and this is analogous to a dependant agent carrying on duties based on his/her principal's instructions. Basu (2007) continues that many web sites are capable of facilitating instantaneous payments for the provision of services and products on-line and this is akin to a person concluding a contract in the name of an enterprise. But the dependency of the website means that it cannot carry out these tasks alone as it is indelibly linked to a server. Both combined would satisfy Article 5(5) of the Model Convention and so could constitute a PE.

Conversely, the U.S. authorities do not have a specific ruling on servers / web sites as a PE (Reimer *et al*, 2011: US Chapter, p. 15) but a White paper (Treasury Paper, ¶ 7.2.3.1) from the U.S. Treasury decided that the use (or lease) of a server would generally not constitute a PE (Levine & Weintraub, cited in Basu, 2007). For a server to be a PE, there must be an actual physical server present, as opposed to the intangible notion of a website. In contrast to the OECD view, Cockfield's (2003) view on PEs is that both web sites and web-servers should not be considered a PE. He argues that the physical presence argument and/or location of the server are not the key issue – they merely add value (literally) to the transaction at hand. Whilst recognising the rise in e-commerce, the problem with the server/PE issue is that it *"will not effectively allocate taxing jurisdiction and revenue to source countries"* (Cockfield, 2003: p.406) and that this model offers multinationals an opportunity to shift income outside of residence countries.

4.2 Fixed place of business

Albregtse (2002, pp. 357-358) does not think that the physical location of the server is a concern *"... it is unimportant where in the world a server is settled"* but that, operationally, it requires electricity and a data connection (communication link) for it to operate. This brings another issue, which hasn't been addressed by the OECD commentary – the mobility of a server. The OECD consideration is *"focused on the server as a single location for the business activities of [the company]"* (Parrilli, 2008: p. 97). The mobility issue is further exacerbated when looking at new developments in server technology for web sites, namely grid and cloud computing. The reason being is that a grid can be located for administrative purposes in one country and have its *"grid components, which materially permit the supply of storage and computing capacity to the clients, all around the world"* (Parrilli, 2009: p. 744). Cloud computing is based on the same model but again, the point remains the same that there can be multiple servers located globally that are constantly being updated, upgraded, replaced, repaired etc. Expanding on this point by way of an illustrative example, an e-commerce business, located in country X, can provide products/services to Internet users in country Y through a web site being hosted on a web server in another country Z. Within a grid/cloud-computing model, a server can be

based in one of the countries (X or Z) that the e-commerce business is located, the Internet user (Y) or even a combination of both. Parrilli (2008: pp. 90-91) attempts to clarify this by using the following model. It involves a multinational that separates off its ICT infrastructure into a separate company. His example stipulates that pre diversification, the parent company sets up servers in different countries and that the offshoot manages and operates the servers for business needs. So therefore, under the PE model, the company utilising cloud computing would have multiple PEs in multiple jurisdictions (Parrilli, 2008, p. 98) Logistically, this would create huge difficulties administrating the corporate tax affairs of the offshoot.

A cloud-computing provider can easily switch on or off where the server data is located, so consideration must be given to the relevant bilateral taxation treaties (DTT) between the offshoot company and the multiple host server countries. The reason being is how each relevant tax authority follows the position of the OECD Model Treaty (Parrilli, 2008: p. 93). Taking each server as an element of the cloud (Parrilli's example concerns grid computing), he argues (Parrilli, 2008: p. 97) that it would be difficult to claim that any of the servers was preparatory or auxiliary to the main business of the company. The reasoning is that the enterprise (from the previous example) cannot fragment its core business into several small operations.

4.3 Alternative taxing methodology

Doernburg (1998) discusses the possibility of applying a low-rate withholding tax for B2B e-commerce sales. This idea uses the Canadian method for assessing corporate income taxes using a ratio of factors including payroll, property or sales. However Cockfield (2003) sees withholding taxes as taxing unprofitable activities and thus "... *punishing cross-border trade and investment*". In the alternative he suggests a "*quantitative economic presence PE*" (2003: p.409) that would permit source countries to tax significant cross-border activity. This would have huge implications for any company with an online presence but the use of "significant" is crucial. Cockfield puts a lower limit of US \$1 Million, limiting the tax exposure to companies with substantial turnover.

Hinneken's (1998) postulates the idea of a "*virtual PE*" (2003: p.410). This idea is broadly similar to the economic presence idea as it looks at source-based taxation. The source country could tax the cross-border profits of the non-resident company only when that non-resident company "*conducted continuous and commercially significant business activity*" within the source country (Cockfield 2003: p.410)

5. Relevant case law

5.1 Personnel

Even though there is no direct reference to personnel within Article 5 of the Model Treaty, the commentary does make reference to it (OECD 2010a, p.92). This states that personnel are not required for a PE, and this relates to whether a server is a PE or not. This is clearly a reference to the Pipeline case, which examined the transfer of crude oil by a Dutch company in Germany (Betriebs – Berater, 1996) and whether the pipeline constituted a PE, in this example, in Germany. The court ruled that the pipeline was more than a temporary installation and crucially, personnel were not required, especially when facilities could work automatically (Choudhary, 2011 and Collins, 2009). Conversely, the Berkholz case took the opposite view where the European Court of Justice (ECJ) declared that gaming machines on a ferry (between Germany and Denmark) required a permanent presence of human and technical resources to be considered a PE (Berkholz 1985)

5.2 Server

As stated previously, the OECD takes the view (through its Model Treaty) that a server could be considered a PE, but only on a case-by-case basis. One such instance came before the tax court of Schleswig-Holstein in 2001 (Vögele, 2002). The details concerned a German corporation owning a server in Switzerland, with considerable income being attributed to the server. The German-Switzerland DTA treated such income as exempt in Germany but the German tax authorities contended that the server was not a PE, which would mean that the entire income was taxable in Germany. The court disagreed and held that the server was a PE. Prior to this decision, the German position was silent on a server as a PE, based on a regulation published in December 1999 (Vögele, 2002).

The other aspect of their decision centred on whether the application of the server was part of a preparatory or auxiliary activity. The court refused to compare the server to the use of *“facilities solely for the purpose of storage, display or delivery of goods or merchandise belonging to the enterprise”* (Article 5 (4) (a) of Model tax Convention). As Vögele points out (2002), the court’s decision was based on a technical reason whereby the information accessed on the server was not comparable to merchandise because it could not be capitalised on the taxpayer’s balance sheet.

In the (*America Online Inc. vs. Johnson* (2002) case the Tennessee Court of Appeals in the U.S. took the view that nexus is created by activities that contribute to a taxpayer’s ability to maintain operations in a taxing state, and doesn’t require a physical presence by the taxpayer itself. The Court had reversed an earlier decision by the Tennessee Chancery Court that had agreed with AOL’s appeal against the Tennessee business taxes levied. AOL’s argument was because their servers were based in Virginia, they shouldn’t be liable to Tennessee state taxes. The Court Of Appeals did not agree, noting that a *“nexus does not require physical presence but is created by conducting activities that contribute to a taxpayer’s ability to maintain operations in the taxing state”*.

Some of the individual member states of the OECD take a different view to that of the OECD commentary deeming a server to be a PE (Parrilli, 2008), even though the OECD definition of a PE is commonly the accepted standard in most double taxation treaties throughout the world (Agenzia delle Entrate, 2007; Basu, 2007; Collins, 2007; Ho *et al*, 2008; Parrilli, 2008 Reimer *et al*, 2011).

6. Research methodology

To get a more holistic perspective on this topic, the writer conducted qualitative interviews with four people, who were carefully selected, based on their respective experience and knowledge in their own area of expertise.

Interviewee	Background
Int1	legal professional undertaking a PhD in cloud computing with particular emphasis on Data regulatory affairs
Int2	senior Revenue official working in international affairs
Int3	ICT professional with over 10 years experience
Int4	International lawyer with particular experience in cloud computing

Each participant had his or her own view of what cloud computing is. **Int1** provided two answers; the first was based on the NIST’s definition (NIST, 2011) and the second was from a practical day-to-day legal viewpoint on why cloud computing *“... is different to everything else and why it has legal consequences”*. **Int2** took the service-based definition of cloud computing that it was based on *“software applications”* being provided through *“infrastructure as a service”* summarising that *“it’s using someone else’s servers as opposed to having your own”*. **Int2** was happy with the idea of the server as a PE so the move forward to the cloud did not pose any problems. When it was put to them about the impact of cloud computing on the PE model particularly in an Irish sense, they concluded that potentially Ireland could lose tax revenue. Any change in Irish tax rules could mean Irish-based data centres moving to a country with more favourable tax rules.

Int3 elaborated on the technical aspect on cloud computing, using a major cloud provider as an example. Structurally, there is a physical server, which has a layer that hosts images. These images are a “snapshot” of a given server at a particular time. The image of the server contains all the relevant information of the cloud customer (i.e., their website). Utilising virtualisation software, when the website is accessed by an end-user via a web-browser, the actual physical location of the website’s server could be in any one of the cloud provider’s hubs, situated worldwide (in fact, one such hub is based in Ireland). As **Int3** noted about a person’s perception of the location: *“The end-user doesn’t know where, nor do they probably care”*. When asked about setting up a business in the cloud, **Int3** pointed out the ease to do so. *“The more that it’s possible to start a business without a real premises (sic), for example, when the different people setting it up are situated in different countries. The notion of a premises is redundant because the place of business is in the cloud and so is virtually anywhere.”*

Int4’s view of cloud computing spoke about *“Ubiquitous computing capacity”* where it is possible *“to access applications from difficult technical means and different locations”*. **Int4** elaborated *“...when we talk about PE, we have to look at the technical definition of cloud computing. Several computing infrastructures located in the same place or in different places that work together in order to make a*

virtual supercomputer". Continuing with this theme "*I think the concept of the PE in the ICT world doesn't make sense – if we accept the concept of the cloud model from a PE viewpoint*". The OECD viewpoint, according to **Int4**, of e-commerce was taken in the Ottawa meeting of 1998 and it still exists "*in practice*". Insofar as "*...some companies could buy one server running solely one website*" – the reality within the ICT sector is that this doesn't happen anymore.

The findings reveal similar thoughts amongst all four of the participants. Of those with intimate knowledge of a PE, **Int2** and **Int4** both referred to Article 5 of the Model Treaty for a definition of a PE. The potential impact of a website and/or web server produced agreement with both interviewees insofar as both saw a server as a PE but not a website. Why? Because a website is "*virtual*" (**Int2**) and is "*not physical*" (**Int4**).

Only **Int1** saw a distinction between a website and a web server. There was agreement that personnel were required although **Int4** thought it was "*contradictory to Article 5*".

One particular question, asked of all participants, was to see what their understanding of the impact of cloud computing. **Int4's** answer was the most striking – they believed that the OECD does not need to specifically worry about cloud computing. **Int4** referred to privacy laws as an example – the Council of Europe privacy rules date back to 1981 and a recent revision wondered if cloud computing should be considered. The answer was no because privacy rules, like tax rules should be "*1. As clear as possible. 2. As neutral as possible and 3. Generic as possible*". **Int4** believes the OECD, back in 1998, were incorrect to provide detailed rules concerning the rise in e-commerce at that time. And that like cloud computing, something new will come along in 10 years so that intelligent, general rules, are necessary.

7. Summary

The central themes of this paper were: What is a PE? In the context of a PE – is there a difference between a web server and a web site and thirdly – does cloud computing have an impact on a PE. These three key areas were examined from different perspectives. The academics agreed with the OECD commentary that a server could be considered a PE and that a website cannot. Basu (2007) attempted to humanise a website but ultimately, the web site is still linked to the server so it cannot be considered a PE in its own right. The influence of cloud computing does not change this opinion as cloud computing still requires physical servers to be present Parrilli (2008). There was one dissenting voice among the academics, Cockfield (2003) does not agree with a server as a PE and has argued for an alternative quantitative economic presence PE, which moves from residence-based taxation to source-based taxation.

To this author, the current definition of Article 5 of the OECD Model Treaty does not deal with the current e-commerce model and needs updating. Should e-commerce (that is, the ICT sector) be specifically excluded from Article 5 is open to suggestion. Does this mean a new Article is required within the Model Treaty encompassing a new form of taxation for e-commerce? Whether this is in the form of a withholding tax or a source-based sales tax is for another day.

References

- Agenzia delle Entrate no. 119/E of 28 May 2007
Albregtse, D.A. (2002) 'The server as a Permanent Establishment and the Revised Commentary on Article 5 of the OECD Model Tax Treaty: Are the E-Commerce Corporate Income Tax Problems Solved?', *INTERTAX*, 30(10), 356-364
America Online Inc. v. Johnson (2002) Tenn. Ct. App., No. M2001-00927-COA-R3-CV, 7/30/02
Berkholz v Finanzamt Hamburg – Mitte – Altstadt C -168/84 (1985)
Betriebs – Berater – Federal Tax Court of Germany (30 October 1996).
Basu, S. (2007) *Global perspectives on E-commerce taxation law*, Burlington: Ashgate.
Choudhary, V. (2011) 'Electronic Commerce and Principle of Permanent Establishment Under the International Taxation Law', *International Tax Journal*, July-August 2011, 33-57
Cockfield, A. (2003) 'Reforming the Permanent Establishment Principle Through a Quantitative Economic Presence Test', *Can. Bus. L. J.*, 38, 400-422.
Collins, T. (2009) 'From Ottawa to Lausanne: Much done but More to Do?', *Electronic Journal of e-Government*, 7(2), 147-154
Hinnekens, Luc. (1998) 'Looking for an Appropriate Jurisdictional Framework for Source-State Taxation of International Electronic Commerce in the Twenty-First Century', *Intertax* 26, p. 197

- Ho, D., Wong, B., and Lau, A. (2008) 'E-business in a globalising world: Hong Kong legal and tax perspectives', *Company Lawyer*, 29(3) 91-95.
- IT-Tude.com (2011) 'What is Cloud Computing' [online], available: http://www.it-tude.com/whatiscloudcomputing_0.html [accessed 16th June 2011]
- Mell, P. and Grance, T. (2011) 'The NIST Definition of Cloud Computing (Draft)', *Electronic Journal of e-Government*, 7(2), 147-154
- NIST (2011) 'NIST Cloud Computing Program' [online], available: <http://www.nist.gov/itl/cloud/index.cfm> [accessed 30th June 2011]
- OECD (2001) *Taxation and Electronic Commerce – Implementing the Ottawa Taxation Framework Conditions*, Paris: OECD
- OECD (2010a) *Model Tax Convention on Income and on Capital*, July, Paris: OECD
- Parrilli, D.M. (2008), 'Grid and Taxation: The Server as Permanent Establishment in International Grids', in Altmann, J., Neumann, D. & Fahringer, T., *Grid Economics and Business Models*, Lecture notes in Computer Science. Heidelberg: Springer, 89-102.
- Parrilli, D.M. (2009), 'Tax Treatment of Companies Providing Grid Services: Direct vs. Indirect Taxation', in Lang, M., Melz, P. & Kristoffersson E., *Value Added Tax and Direct Taxation. Similarities and Differences*, Amsterdam: IBDF, 743-772.
- Vögele, A. (2002). "Lower court sees server as permanent establishment", *International Tax Review*, 51, p.51
- Reimer, E., Urban, N and Schmid, S., eds. (2011) *Permanent Establishments: A Domestic Taxation, Bilateral Tax Treaty and OECD Perspective*, 2010/2011 ed, The Netherlands: Kluwer Law International.
- Stanoevska-Slabeva, K., and Wozniak, T., 2010 'Cloud Basics – An Introduction to Cloud Computing' in Stanoevska-Slabeva, K., Wozniak, T., and Ristol, S., eds. *Grid and Cloud Computing: A Business Perspective on Technology and Applications*, 2010 ed, Berlin: Springer
- Vogel, K., (1997) *Klaus Vogel on Double Taxation Conventions*, 3rd ed. The Hague, London, Boston: Kluwer Law International

The Case of Implementing eGovernment Systems in a Less-Developed Region of the Western Part of Romania

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Abstract: Most of the developing countries face lots of problems while introducing the eGovernance and sometimes they failed. According to R. Heeks (2003), who has pursued substantial research in the subject area, "Most implementations of eGovernment in developing countries fail, with 35% being classified as total failures (eGovernment was not implemented or was implemented but immediately abandoned), and 50% as partial failures (major goals were not attained and/or there were undesirable outcomes)". This research paper addresses the issues which affect the implementation of eGovernment in a less-developed region of the Western part of Romania. It is well-known that implementing eGovernment has always been a challenge either it is social, economical or political. Besides, there are many technological problems which should be understood and meet so that a user to accept eGovernment system emerges. The purpose of our research is to identify the problems related to social, technological, economical etc. that may arise while implementing the eGovernment in a less-developed region. Furthermore, the paper will provide a clear perspective on the problems and challenges which should be considered at the time of implementing eGovernment in less-developed region of a country like Romania. This research provides a quantitative investigation of eGovernment implementation problems with emphasis on analyzing quantitative data gathered in a survey using a structured questionnaires that was generated on the basis of our theoretical study, having as starting point the following question: „What aspects are relevant to be considered when implementing an eGovernment in a less-developed region of a country like Romania?”. The target group of the research consists of practitioners and users of eGovernment systems located in the target area – Beiuș area, the Bihor County. We sampled the target group on the basis of their professional background. We have chosen the government personnel (civil servants/public functionaries) on the one side, and the citizens (the eGovernment's beneficiaries) on the other side, to get the real world problematic issues that exist in the administrative field. From this survey we got our empirical findings. According to our research there are so many problematic issues and challenges on which local government of a less-developed region should focus to make eGovernment effective. The paper reveals them all and proposes solutions therefore.

Keywords: challenges to eGovernment, transition, implementing eGovernance systems, local governments, Western part of Romania (Bihor County)

1. Introduction

There is no doubt that eGovernment is for now on an important tool for public sector transformation, a force for effective and transparent governance and an instrument for citizen participation the government's activity, both at national and local levels. Considering the *Millennium Development Goal* clearly expressed by the UN, "it is no longer a question of whether we can afford information and communications technology in health, education, environmental protection and a multitude of other areas, but where to deploy them first and how rapidly gains can be realized" (UN 2010).

For these reasons, eGovernment is considered to have a decisive contribution to a country's development goals, particularly in developing regions, even if there should be made tremendous efforts to implement eGovernment, both economically and socially. It is well-known that most of the developing countries face lots of problems while introducing the eGovernance and sometimes they failed. "Most implementations of eGovernment in developing countries fail, with 35% being classified as total failures (eGovernment was not implemented or was implemented but immediately abandoned), and 50% as partial failures (major goals were not attained and/or there were undesirable outcomes)" (Heeks 2003). But all countries continue to invest in developing and enhancing their eGovernment systems, considering that the benefits are by far much greater than the necessary efforts.

Under such conditions, this research paper naturally addresses the issues which affect the implementation of eGovernment in a less-developed region of the Western part of Romania – the South-Eastern part of the Bihor County – the Beiuș area. Since it is well-known that implementing eGovernment has always been a challenge either it is social, economical or political. Besides, there are many technological problems which should be understood and meet so that a user to accept eGovernance system emerges.

The purpose of our research is to identify the problems related to social, technological, economical etc that may arise while implementing the eGovernment in a less-developed region. Furthermore, the paper will provide a clear perspective on the problems and challenges which should be considered at the time of implementing an eGovernance in less-developed region of a country like Romania.

This research provides a quantitative investigation of eGovernment implementation problems with emphasis on analyzing quantitative data gathered in a survey using a structured questionnaires that was generated on the basis of our theoretical study, having as starting point the following question: „What aspects are relevant to be considered when implementing an eGovernment in a less-developed region of a country like Romania?”.

2. Theoretical background

2.1 Concepts and definitions

It is important to clearly define the term “eGovernment”, but therefore, it is also important to firstly clarify the meaning of the term “government”. Generally, the word “government” is refers to the institution responsible for political, economical and social control and as well, for the delivery of public goods and services to tackle social issues. Riley (2003) considers that a government represents a superstructure that is both bureaucratically organized and constitutionally legitimized through established and enforced rules, regulations, decisions and roles that are often found in its constitution.

The “eGovernment” is rather a contemporary idiom to which it has been given various definitions and which has been explained in varying contexts. For instance, the World Bank explains that “eGovernment” refers to the government’s use of technology, particularly web-based Internet applications to enhance the access to and delivery of government information and service to citizens, business partners, employees, other agencies, and government entities. It has the potential to help build better relationships between government and the public by making interaction with citizens smoother, easier, and more efficient (Layne and Lee 2001).

The common feature of the above definitions is that eGovernment involves the automation of current non-computerized procedures to communicate with citizens, transact business, and disseminates information by government agencies and is not limited to only the use of internet. That’s the reason why eGovernment exists in different forms including government-to-citizen (G2C), government-to-business (G2C), government-to-government (G2G) and government-to-employee (G2E). G2C applications involve dissemination of information to the public and basic citizen services like licence renewals, ordering of birth/death/marriage certificates and filing of income taxes, as well as citizen assistance for such basic services as education, health care, hospital information, libraries, and so on (Pascual 2003). Other services include obtaining current business information, downloading application forms, renewing licenses, registering businesses, obtaining permits, and payment of taxes.

Examples of eGovernment services include e-tax payment, e-voting, e-procurement, e-health etc.

The drivers for eGovernment are numerous, and include greater efficiency, broader access to government services, improved levels of service, government reform, greater transparency, reduction in corruption and citizen empowerment (Lam 2005). EGovernment is best described as evolving to a more complex system where various services are integrated across all functions of the government.

Figure 1 describes the eGovernment maturity model in terms of complexity and level of integration as presented by Layne and Lee in 2001. At the *catalogue stage*, the government creates records and presents its information on the web. In the final stage which provides eventually a “one stop shopping” for users, there is an augmented horizontal integration of eGovernment services for different functions. After this stage, there is a fully integrated system both vertically and horizontally and this is considered an ideal and matured eGovernment environment.

If well implemented, eGovernment should improve access to and delivery of government services to citizens, strengthen toward effective governance, and increase transparency to better manage a country’s social and economic resources for development.

The advantages of eGovernment adoption include: simplifying bureaucratic procedures, reducing transaction costs, greater efficiency and coordination, avoidance of duplication, greater transparency

of the government's work, accelerated information's sharing between interested agencies and security of information management (UN 2008).

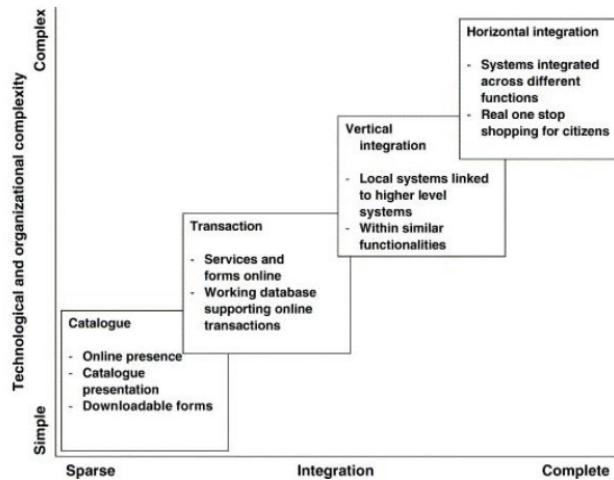


Figure 1: The Layne and Lee (2011) eGovernment model: integration and technological and organizational complexity

For the purpose of this paper, some more concepts need to be further explained with respect to their used meaning, as follows:

- *ICT applications in less-developed regions:* There are many *Information and communication technology* (ICT) applications which can be used in less-developed regions to help speed up the development of the region in time. Fixed telephone and cellular telephone services, Internet services, and e-commerce are the most commonly used applications of ICT in the less-developed and developing regions.
- *Information system (IS):* IS helps people and organizations to utilize technologies gather, process, store, use and distribute information, interact each other, share information, data and technology. In does not only refer to an organization's use of information and communication technology (ICT), but also the arrangement of people that are interacting with this technology in support of business and civic activities/processes. IS implementation refers to the process of getting a new or significantly changed system for using those whom it was planned to make more electronic based system.
- *Less-developed region:* A region of a country with low per capita income, high unemployment rate and most of the people having a lower standard of living. This kind of regions is far away from achieving industrialization with respect to developed regions, and usually, they features monoproduction system.
- *User acceptance:* User acceptance means a system which fulfils the entire requirement that the users of the system expect from it. Lack of user acceptance is the main barrier to implement a successful e-IS.
- *User interaction:* In general, user interaction refers to the interaction between people and computer.

2.2 Theoretical model for eGovernance development: The *Onion Ring Model* (ORM)

There are some definitions of eGovernance focusing on specific activities and functionalities of the e-systems applied in the governments' activities, such as e-democracy and eGovernment are usually adapted terms. If the eGovernment has already been defined within this paper, the e-democracy refers to the processes and structures that include all types of electronic interactions between the government and the citizens. As a consequence, eGovernance could be defined as an electronic application to develop the interactions between government and citizens or business, with the primary goal of enhancing the administrative efficiency (Rajon and Zaman 2008). Thus, the eGovernance does not only imply having website, but also assuring and developing online services and information to enhance mass-participation to decision-making processes, to ensure transparency of the public activities, and to avoid escalating domestic concerns with respect to the actions accountability and the fairness of the public authorities.

When implementing eGovernance it is important to focus not only on the necessary ICT infrastructure or social enterprises, but also on the whole surrounding system, which needs to be adapted to meet the requirements. A good model that presents the whole context of a system's e-development was proposed by Heeks (2005) and is called the 'Onion Ring Model' (ORM) (*Figure 2*). This model calls for an e-development methodology where information drives the process, and not the technology.

According to Heeks (2005), there are four main components of the e-development, such as:

- **Information:** The central point of any e-development system. To understand the role of ICTs in e-development; it is necessary to understand the important role of information first.
- **Technologies:** covers networks, software, hardware - the *new ICTs* -, as well as brains, paper, radio/ TV etc., considered the *traditional technology*.
- **Information systems:** The IS functions among people, algorithmic processes, data and technology. It is not only referring to an organization's use of the information and communication technology (ICT), but also to the people who are interacting with the ICT in support of business processes.
- **Environment:** "Information systems are like trees with their roots hidden in the surrounding 'soil' of organizations, institutions, and environment: political, economic, cultural, etc" (Heeks 2005).

The context factors of many e-development failures are: legal restrictions, cultural factors, infrastructural and economic constraints, and all above, politics. These factors are very important for proposing, planning and implementing an e-development project. The other institutional context factors are organizations, groups, markets, which should be also considered for e-development.

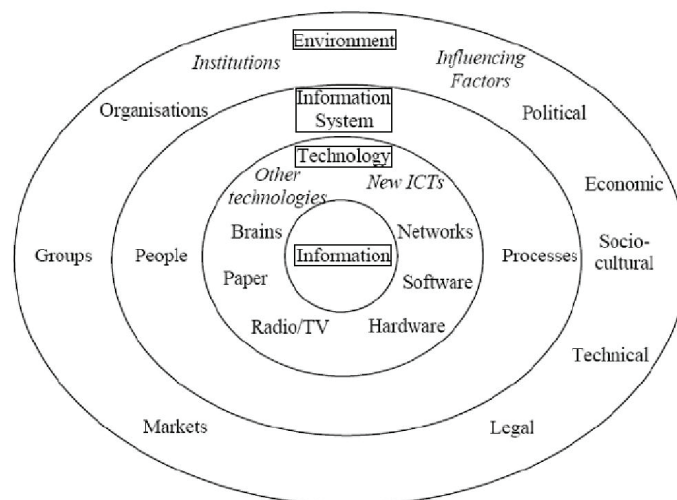


Figure 2: The 'Onion Ring Model' (Heeks 2005)

3. Conditions of eGovernment in Romania

As we have already above mentioned, this research has as starting point the following question: „What aspects are relevant to be considered when implementing an eGovernment in a less-developed region of a country like Romania?” The answers to this question are revealed by studying the following sub-questions: “What are the general problematic issues that hamper the implementation of eGovernment?”, “What are the specific problematic issues that hamper the implementation of eGovernment in the public administration sectors?” which will be considered below. At the time of implementing eGovernment, Romania faces many challenges, most of them being generated by the world economic and financial crisis. As a consequence, Romania obtained the following results in the UN 2010 Survey (UN 2010):

- Rank 47 (index value: 0.5479) in the World top of „EGovernment development index”, of which: Online service component - 0.1414, Telecommunication infrastructure component - 0.1021, Human capital component - 0.3045;
- Rank 42 (index value: 0.4159) in the World top of „Online service index and its components”, of which: Points for emerging information services - 55, Points for enhanced Information services - 38, Points for transaction services - 25, Points for connected approach - 13;

- Rank 58 (index value: 0.3093) in the World top of „Telecommunication infrastructure index and its components”, of which: Estimated Internet users per 100 inhabitants – 23,99, Main fixed telephone lines per 100 inhabitants – 23,58;
- Rank 46 (index value: 0.9226) in the World top of „Human capital index and its components”, of which: Adult literacy rate (%) – 97,60, Combined gross enrolment ratio for primary, secondary and tertiary schools (%) – 81,58;
- Rank 64 (index value: 0.1857) in the World top of „E-participation Index”.

Romania (0.5479) is on the 6th place after the Hungary (0.6315) which is leading the Eastern Europe region from the point of view of eGovernment development (*Table 1*). „The Ministry of Finance of Romania scored high for the region due to the availability of a number of e-services as well as extensive content” (UN 2010).

Table 1: eGovernment development in Eastern Europe

Country	E-government development index value		World e-government development ranking	
	2010	2008	2010	2008
Hungary	0.6315	0.6494	27	30
Czech Republic	0.6060	0.6696	33	25
Slovakia	0.5639	0.5889	43	38
Bulgaria	0.5590	0.5719	44	43
Poland	0.5582	0.6134	45	33
Romania	0.5479	0.5383	47	51
Ukraine	0.5181	0.5728	54	41
Russian Federation	0.5136	0.5120	59	60
Belarus	0.4900	0.5213	64	56
Republic of Moldova	0.4611	0.4510	80	93
Sub-regional average	0.5449	0.5689		
World average	0.4406	0.4514		

Source: UN 2010, p. 72

For a less-developed region of the Western part of Romania like the Beius area of Bihor County is, it was always a big challenge to finance the capital exhaustive endeavours like access basements and communication infrastructure. The Beius area has a population of about 50500 people, equivalent to 8.5% of the total population of the Bihor County. Most citizens living in this area have a very low purchasing power for newer ICT tools, compared to the average in Romania and the tools' price on the domestic market. Besides, with respect to the UN 2010 Survey results, according to the INS Statistics (2011) the selective indexes for the Beius area are as follows:

- Online service index and its components: Points for emerging information services - 1, Points for enhanced Information services - 0, Points for transaction services - 0, Points for connected approach - 0;
- Telecommunication infrastructure index and its components: Estimated Internet users per 100 inhabitants – 10,17, Main fixed telephone lines per 100 inhabitants – 15.29;
- Human capital index and its components: Adult literacy rate (%) – 78.80, Combined gross enrolment ratio for primary, secondary and tertiary schools (%) – 69.23,

Which place this area much below the national average and directly related to its economic development indexes. While establishing eGovernment, a lack of awareness among the public managers represents a particular concern, as well. Awareness is best understood as social inference of computer-produced signs. (Oulasvirta et al 2007). In the target area of Beius the higher officials of public authorities are not interested to familiarize with new technology. There are several reasons to make them resist of using computers, such as: resistant to any kind of change in their familiar working

environment; fear of computerization of different government activities may also make some people redundant; thinking computers are meant for low-level work like typist. In the Beius area the awareness factor has a vast impact on implementing any IS. The IT literacy of this region is one of the main reasons for the lack of awareness.

ICT infrastructure is known as one of the key barriers for implementing eGovernance. To enable appropriate information distribution and opening new channels for communication for supplying new services, internetworking is necessary (Tapscott 1996). Many less-developed region authorities are not capable of organizing the appropriate ICT infrastructure for eGovernance deployment and they suffer from the digital gap, which compared to the developed regions, is large – 40 to 1. The ICT development is fundamental for implementing eGovernance, but it does not only consist of telecommunications and computer equipment. E-readiness and IT literacy are also important in order for the people to be capable of using and getting benefits from eGovernment applications. Network infrastructure is one of the main parts of ICT infrastructure. In the last few years Romania has had rapid growth in mobile networks providing an effective way to connect with the internet. Now these mobile networks cover 93% area of the country. In Romania now total number of mobile Phone Active Subscribers has reached 7 million at the end of October 2010. In Internet Service Provider (ISP) companies are providing service 73% of the country area in Romania.

Also the lack of basic computer education is the barrier of developing a modern technology based society. In Romania, it is relatively very easy of getting computers into universities and institutions. But the main challenges are keeping them up and running. There are another challenge to resolve the technical problems because the laboratory coordinators are not enough skilled therefore. Language plays an important role in influencing internet usage. Since the Internet is dominated by English language content, English speaking countries have a strategic advantage in promoting the use of Internet, while non-English speaking countries face enormous difficulty in tapping into the potential of the Internet as an information source. In conclusion, the key aspects that are necessary to consider when implementing eGovernment in a less-developed region like Beius area are as follows:

Sub-question one: What are the general problematic issues that hamper the implementation of eGovernment in Romania?

- High-cost, low-reliability of Internet access
- Inadequate ICT Infrastructure and Planning
- Lack of Awareness
- Lack of ICT resource
- Lack of native language standardization
- Lack of training facilities
- Low financial capability.

Sub-question two: What are the problematic issues that hamper the implementation of eGovernment in Administration sector only?

- Inadequate access to ICT by government personnel
- Lack of enabling rural investment climate
- Lack of ICT professionals in government's structures
- Low level educated agricultural livelihood
- No proper Regulating ICT authority
- Non-acceptability of IT systems
- Weak rural institutions.

4. Empirical study

4.1 Purpose and method

The purpose of the empirical study is to verify the issues found by the theoretical study as well as to find out some new issues the public authorities and/or the users of the eGovernment are facing, by

using the survey method. In our research we applied non-probability sampling method to the users and responsible personnel of the eGovernment in the target region who are familiar with the eGovernment processes and system as well as other people who has no idea about this term but their occupation is related to the eGovernment or they should benefit of eGovernment, to get the appropriate data. It was difficult to find respondents with sufficient experience of eGovernance in the target area, but they were divided in two categories such as: government personnel, and large public (citizens/eGovernment's beneficiaries). Using this non-probability sampling, the sample frames were asked the same series of common question, while five specific issues were asked additionally to government personnel only. Ethical considerations were maintained and confidentiality was ensured.

4.2 The questionnaires

The survey questionnaires are divided into two part general questionnaires, and specific issue questionnaires. In the first part of the survey respondents were asked to identify the general problem that all the users of the system face. In addition, they were asked to respond to general questions about IT expertise levels, their professional background and common problem issues. In the second part of the survey each only the government personnel respondents were asked about the problems they face from their own professional point of view. We made this questionnaire on the basis of our theoretical findings. The questionnaire is presented in *Appendix 1*. The survey questionnaire was sent to the respondents by eMail or personally, using the paper based survey. The answers of the questionnaires are represented by using different tables and figures. Survey questionnaires were distributed to about 700 people. Some of them were well educated and aware of eGovernment, and some of them had no idea about this term but their professional background is related to the subject area. Among them 550 questionnaire were sent by eMail and rest of 150 were requested personally, on paper. From eMail based survey we got 517 responses (86% response) and from paper based survey we got 83 responses (14% response). After conducting paper and eMail based survey our total respondents are 600, out of which 25% are government personnel respondents, while the rest of 75% are citizens (large public, others than government personnel) (*Figure 3*).

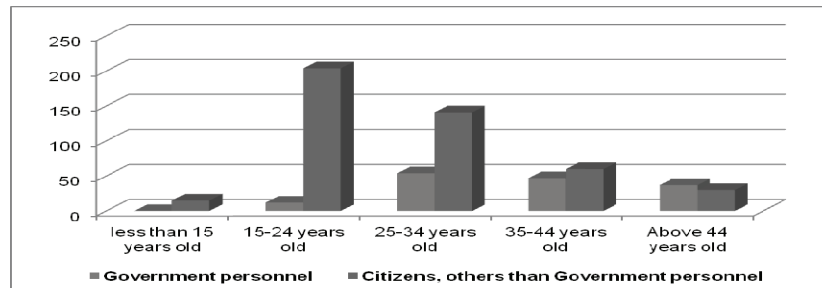


Figure 3: The number of respondents by category and age

The age groups of respondents were categorised in: less than 15 years old, 15-24 years old, 25-34 years old, and 35-44 years old and above 44 years old. The survey respondents were also categorized into two categories, according to our research interests, like government personnel and others. The total number of questions asked to the respondents is 32 (27 commonly, plus 5 applied to the government personnel only) (*Appendix 1*). The percentage of the male and female respondents is shown in *Figure 4*, which reveals the fact that the majority of our respondents were male, which is quite normal if the target groups are considered.

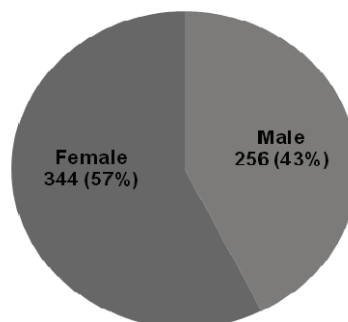


Figure 4: The number of respondents by gender

Tables 2-8: Answers given to the 25 common questions by all respondents (excepting the age and gender)

Table 2

Question's no. and name	Total	Yes	No	Others
4. Have you ever heard about e-governance?	600	287	178	135
5. Are you using e-government services?	600	87	409	104
6. Do you think the government services are affected by the human-factor?	600	532	45	23
8. Do you think human-factor could be avoided/ minimized by using computer-based services?	600	314	119	167
9. Do you think it is possible to implement e-based system instead of current paper based system in public administration services?	600	293	186	121
10. Do you know that the government has planned to implement an e-government system where most of its information can be processed easily without having to visit the public administration institution?	600	372	118	110
11. Do you think there is a need of implementing e-government in your area?	600	424	97	79
15. Do you feel any resistance to change the public administration system form paper based to e-system?	600	365	136	99
16. Technology is changing rapidly. Do you face any problem with?	600	131	385	84

Table 3

Question's no. and name	Total	1-poor	2-fair	3-satisfactory	4-good	5-excellent	6-others (N/A)
17. Please, give your opinion on the response towards using e-government services in your region.	600	289	107	32	30	7	135
18. What is the level of your computer experience?	600	117	53	98	168	143	21
19. How do you appreciate the information put on the current regional public administration websites?	600	211	102	132	64	42	49
20. What is the level of your knowledge about e-government?	600	37	108	148	90	27	190
21. Are you satisfied of your internet facilities?	600	103	84	182	63	76	92
22. How easily can you get computer facilities?	600	146	93	84	77	76	124
23. Do you think that there are enough training facilities to adopt e-government services?	600	192	148	82	65	74	39
24. How expensive is for you to get internet services?	600	152	134	101	77	76	60
25. Do you think that changing technology hamper the development of the e-government system?	600	28	90	147	108	37	190
26. How do you appreciate the information availability?	600	223	105	144	53	72	3
27. What is your level of satisfaction with respect to getting electricity?	600	12	17	49	139	373	10

Table 4

Question's no. and name	Total	School	College	University	Others
3. What is the level of your education?	600	286	103	201	10

Table 5

Question's no. and name	Total	Getting information of general facts	Administration	Agriculture	Business	Education	Healthcare	None
7. What kind of services provided by e-governance do you usually use?	600	15	115	9	16	8	6	431

Table 6

Question's no. and name	Total	Web based	Cell phone	Traditional
12. What kind of e-government services are the most suitable for you?	600	178	199	223

Table 7

Question's no. and name	Total	As low as possible	Enough to provide better services	As much as needed
13. How much money government should spend on developing e-government system?	600	314	201	85

Table 8

Question's no. and name	Total	National language (Romanian)	English	No answer
14. What languages should be use by the e-government services to communicate with people?	600	539	17	44

Table 9 shows the answers given to the last 5 specific questions (28-32) by the government personnel only.

Table 9: Answers

Question's no. and name	Total	Yes	No	Others
28. Do you think that the government has enough policy and regulations to implement e-government?	150	93	51	6
29. Do you think that the government has enough data to implement the e-government system?	150	32	114	4
30. Do you think that the government has IT skilled people to implement the e-government system?	150	57	93	0
31. Do you think that the government has enough financial resource to implement the e-government system?	150	22	126	2
32. Do you think that the government has enough skilled project management people?	150	49	98	3

5. Results analysis and conclusions

The answers given to the applied questionnaires reveal the most important problematic issues for the implementation of the eGovernment system in the Beius area of the Bihor County, Romania. Summing up the results obtained from the applied questionnaires, we can admit that there are many problematic issues that hamper the implementation of eGovernment in Romania, both generally and specifically, in administration sector only, but their importance for the selected respondents is variable, as presented in *Table 10*.

Table 10: Summative results obtained from the applied questionnaires

Mean results per issue (% of the total respondents)	Citizens (large public, others than government personnel) (% of the total respondents)	Government personnel (% of the total respondents)
$A=75\%B+25\%C$	B	C
90%-National language standardization in e-systems	92.38	82.87
84%-Lack of financial resources	79.37	97.89
76%-Lack of data necessary to implement the e-government system	77.06	72.83
67%-Lack of awareness	73.83	46.50
65%-Lack of skilled instructor	75.94	32.19
62%-Lack of IT skilled people in the government sector	69.88	38.35
61%-Resistance to change paper based system to e-system	63.33	54.00
57%-Lack of training facilities	66.33	29.00
42%-Lack of information availability	52.73	9.80
36%-Lack of computer facilities	46.20	5.40
34%-Lack of policy	27.50	53.50
33%-Lack of internet facilities	40.37	10.90
29%-Lack of computer knowledge	33.57	15.30
28%-Computer illiteracy	32.50	14.50
24%-Rapidly changing technology	24.10	23.70
8%-Cost of computer and related accessories	10.27	1.20
0,4%-Insufficient electricity	0.53	0.00

If we consider our results as reflected in *Table 10* from the perspective of the 'Onion Ring model', our empirical findings reveal the fact that 55% of the respondents consider the '*Lack of information availability*' as one of the problematic issues for implementing eGovernment in the target region. This could be explained either by the lack of interest from the part of our respondents, or by the lack of appropriate information channels, if the relatively high rate (28%) of computer illiteracy in the region is also taken into consideration.

According to the ORM, the 'Lack of computer facilities' is the most important *technological problematic issue* that should be taken into consideration when implementing eGovernment in the Beius region, while the 'Lack of skilled instructor' is the most *IS problematic issue*, followed immediately by the 'Lack of IT skilled people in the government sector'.

The *Environment problematic issues* are represented by the national language standardization in e-systems and the lack of financial resource, as the main ones.

The empirical and theoretical results are analyzed and compared, and the differences and similarities are revealed. There are different nations and cultures in the world and each of them has their own language and tradition. Normally people feel more comfortable when they use their native language to communicate and for learning purpose. In a developed country like Romania where literacy rate is 98.3% (UNDP 2010) which is very high, for the case of introducing new feature of ICT or for computer training, the introduction of the Romania language is requested in a less-developed region like Beius is. Otherwise it will not bring any satisfactory level of result. Nowadays in Romania, if we consider the results from the surveyed region, the ICT feature and/or computer program are introduced in English language that is not in native language. So it is difficult to get acceptance from mass level of population, since 90% of the questioned people wants all these services in their national language.

The training opportunity represents a vital necessity for introducing eGovernment, as 57% of the respondents indicated its lack.

Lack of computer facilities was indicated by 36% of the respondents, which correlated with the 33% lack of internet facilities, could represent a major problem for the implementation of eGovernment in Romania. But the problem is directly related to the lack of financial resources therefore, issues which were also mention as problematic by 84% of the government personnel.

The rapidly changing technology is problematic for IT implementation, but it was viewed as a highly problematic issue only by 24% of the respondents.

With respect to the problematic issues that hamper the eGovernment implementation as seen by the government personnel, the most important one is the lack of skilled decision-making persons. This also represents the source-problem for the wrong decisions and for no quality implementation of eGovernment. From our survey we observed that 62% of the respondents don't have enough IT skill, 29% don't have IT knowledge, and 61% manifest resistance to change paper based system to e-system. This resistance could be explained through the fact that the people do not trust the computer system due to the lack of awareness and concerns about the security.

In conclusion, the eGovernment implementation in the Beius region (Bihor County), Romania, faces some specific problematic issues. Without proper ICT infrastructure and proper awareness among the users of the eGovernance system it is not possible to implement and set up an effective eGovernment system in this region. Users should have enough knowledge about the eGovernment system and its services. Proper planning is also an important aspect for implementing a successful eGovernment system, including with respect to the financial resources needed, which must be in place. At the same time, the people and the government authorities should give more attention to computer study.

Acknowledgements

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Appendix 1: The questionnaire applied within our survey

THE QUESTIONNAIRE

1. What is your age?
Under 15 years old ☐ 15-24 years old ☐ 25-34 years old ☐ 35-44 years old ☐ Above 44 years old ☐
2. What is your gender?
Male ☐ Female ☐
3. What is the level of your education?
School ☐ College ☐ University ☐ Others ☐
4. Have you ever heard about e-governance?
Yes ☐ No ☐ Others ☐
5. Are you using e-government services?
Yes ☐ No ☐ Others ☐
6. Do you think the government services are affected by the human-factor?
Yes ☐ No ☐ Others ☐
7. What kind of services provided by e-governance do you usually use?
Getting information of general facts ☐ Administration ☐ Agriculture ☐ Business ☐ Education ☐ Healthcare ☐ Others ☐ None ☐
8. Do you think human-factor could be avoided/ minimized by using computer-based services?
Yes ☐ No ☐ Others ☐
9. Do you think it is possible to implement e-based system instead of current paper based system in public administration services?
Yes ☐ No ☐ Others ☐
10. Do you know that the government has planned to implement an e-government system where most of its information can be processed easily without having to visit the public administration institution?
Yes ☐ No ☐ Others ☐
11. Do you think there is a need of implementing e-government in your area?
Yes ☐ No ☐ Others ☐
12. What kind of e-government services are the most suitable for you?
Web based ☐ Cell phone ☐ Traditional ☐
13. How much money government should spend on developing e-government system?
As low as possible ☐ Enough to provide better services ☐ As much as needed ☐
14. What languages should be use by the e-government services to communicate with people?
National language ☐ English ☐ No answer ☐
15. Do you feel any resistance to change the public administration system form paper based to e-system?
Yes ☐ No ☐ Others ☐
16. Technology is changing rapidly. Do you face any problem with?
Yes ☐ No ☐ Others ☐

This section question is measured in 6 point scale: 1-poor, 2- fair, 3-satisfactory, 4-good, 5-excellent and 6-others

17. Please, give your opinion on the response towards using e-government services in your region.
1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐
18. What is the level of your computer experience?
1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐
19. How do you appreciate the information put on the current regional public administration websites?
1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐
20. What is the level of your knowledge about e-government?
1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐
21. Are you satisfied of your internet facilities?
1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐
22. How easily can you get computer facilities?
1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐
23. Do you think that there are enough training facilities to adopt e-government services?
1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐
24. How expensive is for you to get internet services?
1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐
25. Do you think that changing technology hamper the development of the e-government system?
1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐
26. How do you appreciate the information availability?
1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐
27. What is your level of satisfaction with respect to getting electricity?
1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐

ONLY if you are government personnel, please answer the following questions:

28. Do you think that the government has enough policy and regulations to implement e-government?
Yes ☐ No ☐ Others ☐
29. Do you think that the government has enough data to implement the e-government system?
Yes ☐ No ☐ Others ☐
30. Do you think that the government has IT skilled people to implement the e-government system?
Yes ☐ No ☐ Others ☐
31. Do you think that the government has enough financial resource to implement the e-government system?
Yes ☐ No ☐ Others ☐
32. Do you think that the government has enough skilled project management people?
Yes ☐ No ☐ Others ☐

References

- Heeks, R. (2003) „Most eGovernment –for Development Projects Fail: How can Risks be Reduced?“, *iGovernment Working Paper Series*, paper no. 14.
- Heeks, R. (2005) *Foundations of ICTs in Development: The Onion-Ring Model*, [online], <http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/short/DIGBriefing4Onion.pdf> (accessed during November 2011 – January 2012)

- National Institute of Statistics, Romania - INS (2011), [online], <http://www.insse.ro/cms/rw/pages/index.en.do>, (accessed during November 2011 – January 2012)
- Lam, W. (2005) Barriers to eGovernment Integration, *The Journal of Enterprise Information Management*, Vol. 18 No. 5, pp. 511-530
- Layne, K., Lee, J. (2001) Developing fully functional EGovernment: A four stage model, *Government Information Quarterly*, vol. 18, no. 2, pp. 122(15)
- Oulasvirta, A. (2007) „Social inference through technology”, in P. Markopoulos, W. MacKay, & B. de Ruyter (Eds.), *Awareness Systems: Advances in Theory, Methodology and Design*, Springer, Series on HCI
- Pascual, P.J. (2003) *eGovernment: e-ASEAN Task Force UNDP-APDIP*
- Rajon, S. A. A., Zaman, S. A. (2008) Implementation of EGovernance: Only Way to Build a Corruption-Free Bangladesh, *International Conference on Computer and Information Technology*, Khulna: 25-27 December, 2008 (ICCIT 2008)
- Riley, T. (2003) *EGovernment versus eGovernance: Examining the differences in a changing public sector climate*, [online], <http://www.electronicgov.net/.../IntlTrackRptMay03no4.pdf> (accessed during November 2011 – January 2012)
- Stair, R. and Reynolds, G. (2009) *Principles of Information Systems*, 9th Edition, Cengage Learning USA
- Tapscott, D. (1996) *The Digital Economy* New York: McGraw Hill
- United Nations-UN (2008) *United Nations eGovernment survey 2008: from eGovernment to connected governance*, Department of Economic and Social Affairs, Division for Public Administration and Development Management, New York
- United Nations-UN (2010) *United Nations eGovernment survey 2010: Leveraging eGovernment at a time of financial and economic crisis*, Department of Economic and Social Affairs, Division for Public Administration and Development Management, New York, [online], http://www2.unpan.org/egovkb/global_reports/10report.htm (accessed in November 2011 – January 2012)
- UNDP (2010) *Romania – Country profile*, [online], http://www.undp.ro/profile_romania.php (accessed in November 2011 – January 2012)
- Zaman, G., Cristea, A. (2011) EU Structural Funds Absorption in Romania: Obstacles and Issues, in *Romanian Journal of Economics*, Issue 1/2011, [online], <http://www.revecon.ro/articles/2011-1/2011-1-4.pdf> (accessed in December 2011)

Exchange Formats for Office Documents - A Survey of Swiss Public Administrations

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Abstract: In April 2010 the IT department of the Canton of Vaud decided to migrate its whole office workstations' park (10'000 machines) from Microsoft Windows XP and Office XP to Windows Seven and Office 2010. In parallel they decided to establish recommendations in terms of exchange of office document and mandated us for a survey on the situation of office document formats in use at the Swiss Federal and Cantonal levels. In our paper we will present a brief panorama of the international situation (based on a literature review) and the results of the survey we conducted between January and March 2011. We sent out an online questionnaire through the Swiss Conference on Information Technology, an association grouping the IT departments of all Cantons and cities in Switzerland. The respondents were mostly IT managers from various public departments and offices, amongst which 156 completed the survey on behalf of their organization (88 from the French-speaking part of Switzerland and 68 from the German-speaking part). We found out that barely more than 25% of the public administrations we surveyed had recommendations in terms of office document formats, whereas almost 70% of the respondents do often or sometimes have compatibility problems when they exchange documents. When civil servants exchange documents that are read-only, they use the .pdf format and this usually does not raise any major issue. However when these documents have to be modified as well, it can quickly become quite complicated depending on office suites and versions being used, and on operating systems. Our phone interviews largely confirmed that a large number of issues were related to the use of advance functions such as merging, macros or VBA scripts, and that these functions are very widely used within administrative processes.

Keywords: office documents, survey, open format, public sector, strategy, recommendation, exchange

1. Introduction

In April 2010 the IT Department of the Canton of Vaud in Switzerland decided to migrate about 10'000 workstations from Microsoft Windows XP and MS-Office XP to Windows Seven and MS-Office 2010. In parallel they decided to investigate the matter of office document exchange within the administration of the Canton of Vaud and with external partners. Indeed they had identified compatibility problems between various versions of office suites and various operating systems. They mandated us to investigate the issues of office document exchange in Switzerland, in particular at the level of cantonal administrations (there are 26 Cantons in Switzerland). By office document we mean documents produced by word processors, spreadsheets, and presentation software, as well as drawing, database, or project management software.

We set up an online survey, both in French and in German, that we sent out through the Swiss Conference on Information Technology, an association grouping the IT departments of all Cantons and cities in Switzerland, and through our personal contacts in IT departments of Swiss public administrations. The survey took place between January and March 2011 and we got 156 complete questionnaires (88 from the French-speaking part of Switzerland and 68 from the German-speaking part). We completed this online survey by six phone interviews of representatives of the IT departments of the Cantons of Geneva, Fribourg, Jura, Neuchâtel and Valais.

This paper is organised as follows: in section 2 we will discuss the context of documents exchange (existing formats, international situation, etc.) and in section 3 we will discuss the main results of the survey. Section 4 will summarize the recommendations we made to the Canton of Vaud.

2. Context

As we started researching the topic of office document exchange we quickly realized that there were only two options for document formats: Office Open XML (OOXML) supported by Microsoft, and Open Document Format (ODF). Furthermore we found out that there were almost no work specifically dedicated to document formats (apart from technical comparisons), but that actually most work was on the office suites (e.g. Microsoft Office vs. OpenOffice.org). This confusion between formats and suites turned up many times during our survey as well. Without going into details let us just mention that it is possible to work with the ODF format in MS-Office and with OOXML in OpenOffice; this

shows that formats and suites are not completely bound to each other. Of course most users stick with their office suite's native format, i.e. OOXML in MS-Office and ODF in OpenOffice.

Until the beginning of the years 2000, office document formats were usually proprietary, with the .doc format from Microsoft being a de facto standard for word processing. Indeed a report published in 2003 estimated the Microsoft market share of office documents at 95% (Valoris, 2003). However it became more and more difficult to read older documents (e.g. created in the 90's) and this situation led to the development of open formats such as ODF and OOXML. Open Document Format (ODF) was originally developed by Sun Microsystems and became an ISO standard in 2006. This format is used in the OpenOffice.org and in the LibreOffice suites (these are open source alternatives to the ubiquitous Microsoft Office Suite), as well as in Google Docs. On the other hand Microsoft developed its own format called Office Open XML (OOXML) that was certified by another standardisation body, namely the ECMA. OOXML also became an ISO standard in 2008. However there are several branches of OOXML: the ECMA-376 First Edition, that was refused by ISO; the ISO/IEC 29500 Strict that was accepted by ISO; and the ISO/IEC 29500 Transitional that was proposed in order to allow Microsoft to move towards the ISO Strict Version. As MS-Office 2010 is still largely based on the Transitional standard, some doubt that Microsoft is seriously willing to respect the strict version of OOXML (Ryan, 2010). For practical reasons we will not distinguish the various OOXML flavours in this study. Although both these standards are ISO certified and XML-based, there are known interoperability issues (Shah & Kesan, 2008). As mentioned above, the focus of this study is not on the technical aspects of office documents formats, for more on this see e.g. (Eckert, Ziesing, & Ishionwu, 2009). Regarding the market share of these formats we have not found any figures, but as estimation we can guess that OpenOffice users use the default ODF format. Table 1 shows a very rough estimation (based on a web statistics service) of OpenOffice market share. Here we should also mention that Oracle discontinued OpenOffice after buying Sun Microsystems (in May 2011) and that a new branch of the open source office suite appeared under the name of LibreOffice. For more on Microsoft's market dominance and open standards, see (Casson & Ryan 2006).

Table 1: Estimated market share of MS-Office and OpenOffice in 2010, adapted from (Thomas H., 2010)

Country	OpenOffice (%)	MS Office (%)
Poland	22	68
Czech Republic	22	76
Germany	21	72
France	19	76
Italy	18	81
Spain	15	80
Norway	18	71
Denmark	14	79
Belgium	14	85
Sweden	13	68
Austria	12	85
Luxembourg	12	81
Switzerland	11	85
Canada	11	79
Hungary	11	77
Australia	10	78
United States	9	75
United Kingdom	9	80
Netherlands	8	88

Many governments published recommendations in terms of office document formats and almost all of them strongly recommend ODF (see OpenDocument Adoption). However several governments also include OOXML in their watch-list as the MS-Office market share makes it impossible to leave it aside (see Office Open XML Adoption)

3. Survey

We produced the online questionnaire with SurveyMonkey.com, both in French and in German. The survey took place between January and March 2011 and we got 156 complete questionnaires (88

from the French-speaking part of Switzerland and 68 from the German-speaking part). The questionnaire was sent to public administrations from all Swiss Cantons and from a selection of large cities (by Swiss standards, i.e. small cities for the rest of the world). The channels that were used were the Swiss Conference on Information Technology, an association grouping the IT departments of all Cantons and cities in Switzerland, and our personal contacts in IT departments of Swiss public administrations. This explains the over-representation of the French-speaking part of Switzerland, as we have much more contacts there. Although the online survey was anonymous, one of the questions was whether respondents would agree to be contacted to discuss these issues further on (in which case they could give us their contact details). 25 respondents did so and we selected six of them from the French-speaking Cantons of Geneva, Fribourg, Jura, Neuchâtel and Valais. We also got close to 450 comments and precisions. For each type of tools (word processor, spreadsheet, presentation, diagraming, project management, database management system, image editor) we asked questions on the software and on the document format in use. A second part of the questionnaire was dedicated to recommendations and IT strategies regarding office documents, as well as issues such as compatibility, permanence, security or back-ups. As word processing documents make for the bulk of office documents (see Table 2), we will only show these results here.

Figure 1 and 2 show that most public administrations in Switzerland have not yet migrated to Office 2010 (which supports OOXML as a native format, with the .docx file name extension) and are still using older versions where the native format is the proprietary .doc and where filters have to be installed in order to work with OOXML. However about 70% of the respondents not yet using Office 2010 stated that a migration to this suite was planned in the coming two years. OpenOffice Writer and ODF are used by under 10% of the respondents (15% in the French-speaking part of Switzerland and 5% in the German-speaking part), but they are almost systematically used in parallel with MS-Office. Some comments also indicate the use of cloud solutions such as Google Docs, mostly for ad-hoc collaboration projects. By cross-tabulating answers we also found a tiny proportion of MS-Office users on Mac computers. Figure 3 shows that most respondents (around 80%) use either .doc or .pdf formats to exchange word processing documents with partners (usually .pdf is used when documents are “read-only” and .doc when documents have modifiable).

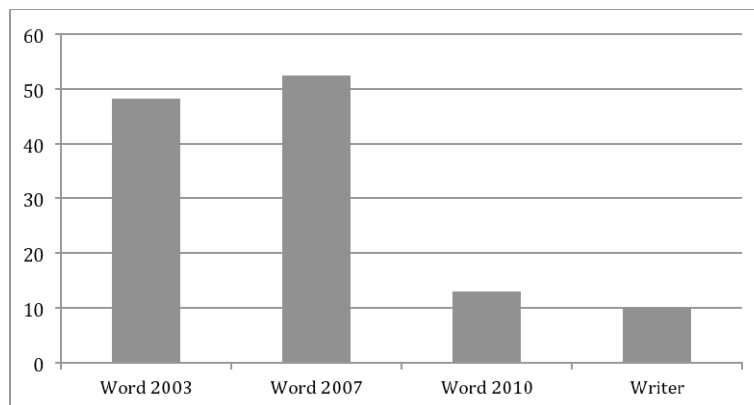


Figure 1: Which word processor do you use? (% , several answers possible)

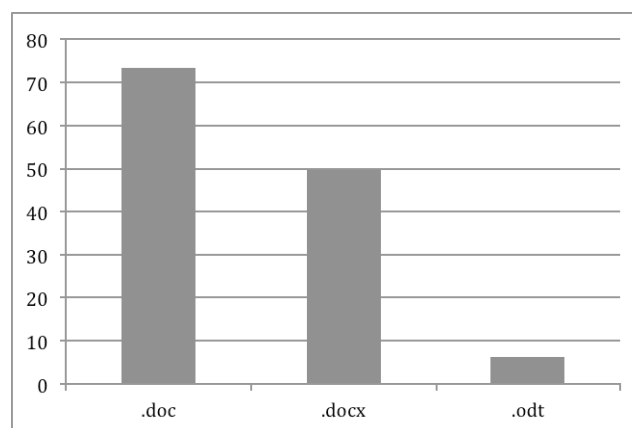


Figure 2: What format do you use to save word processing documents? (% , several answers possible)

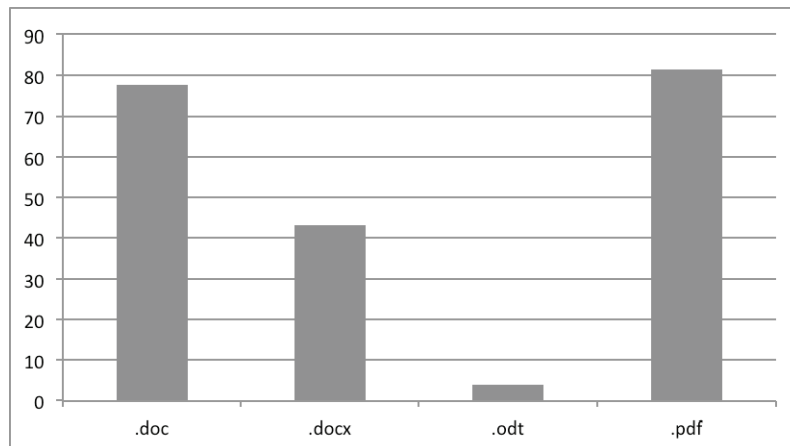


Figure 3: What format do you use to exchange word processing documents? (% , several answers possible)

Figure 4 shows that compatibility problems are an issue for more than 70% of the respondents (often or sometimes). Interestingly comments show that problems occur most of the time between various MS-Office document formats and versions rather than between ODF and OOXML. Some comments also indicate problems between office documents produced on a Windows PC and on a Mac computer.

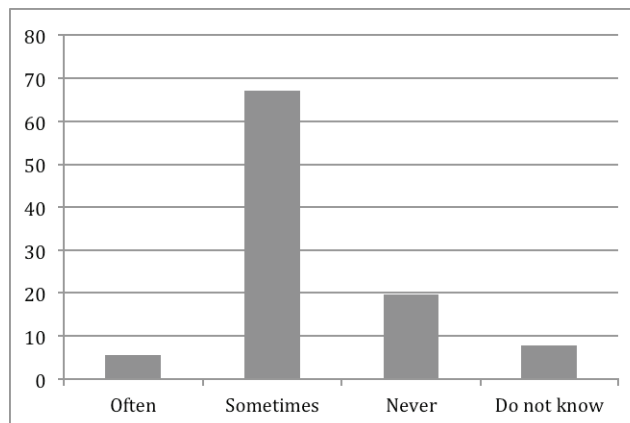


Figure 4: Have you ever had compatibility issues between various formats of office documents? (%)

It also quite clear that most respondents work in organizations where no recommendations are available or that they are not aware of them if they do exist (Fig. 5).

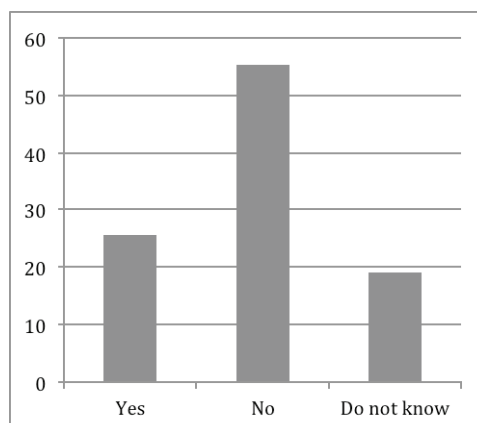


Figure 5: Does your organization have recommendations in terms of office document formats? (%)

Our phone interviews brought several interesting additions to the online survey. The number one issue in terms of compatibility for the small sample we interviewed was the use of advance functions such as Visual Basic for Applications (VBA) scripts, macros, or mail merge tools. These are rather widely used in public administrations, e.g. to generate forms, authorizations, certificates, etc. A

second finding is that all respondents doing real “office” work (i.e. clerical) use MS-Office and proprietary formats, whereas OpenOffice and ODF are used mostly in schools. Indeed the Education departments of several Swiss Cantons recommend these and even install these by default on all computers of the pedagogical domain (typically the NeoOffice version of OpenOffice on Mac computers). Most interviewees also stated that open formats were recommended at the political/strategical level but that it was extremely difficult to migrate towards these, as many business applications interact with MS-Office (e.g. in the Canton of Vaud all business authorizations are generated as .xls files by the dedicated business software). Regarding document exchange, it turned out that native formats (.doc and .docx) are used mostly to exchange data within a given organisation and that .pdf documents are used to exchange documents outside of the organisation. Finally there seems to be a will to delete Access and Filemaker office applications “whenever possible” as these usually give headaches to IT departments.

4. Conclusions

Nowadays there is basically the choice between two families of office document formats, ODF and OOXML, both being ISO standards. Although some authors such as (Blind, 2011) question the economic rationality of having two competing standards, the main issue is certainly the level of interoperability offered by each format. As technical qualities of ODF and OOXML are not differentiated enough to allow for a recommendation based on these criteria only, interoperability is thus a factor of the market share of each format. Table 2 contains numbers provided by one of the surveyed canton: they show the number of files and the space they use of the servers of this public administration. Of course these numbers cannot be generalized but we think they give a good picture of the situation in public administrations. MS-Word and Excel files make for 98% of the total number of stored documents, and OOXML is not used at all. Instead the proprietary .doc and .xls format are being used. Furthermore most of the Swiss Cantons have already migrated their workstations to Windows Seven / Office 2010 (or were planning on doing so in the coming year when we conducted the survey), and OpenOffice is used by only about 10% of the respondents. It is rather safe to say that although most governments recommend the use of open standards and open source tools, the reality of public administrations is completely different. A pragmatic approach is certainly to stay with the most widely used formats and office suites, i.e. OOXML and MS-Office. At the time of writing, OpenOffice has been available in version 3.3 for about a year and given by Oracle to the Apache Foundation. LibreOffice is in version 3.4.5 since January 2012, but the fact that there is no large company behind it might be a barrier for some public administrations.

Table 2: Number and size of files per format in one of the surveyed canton (September 2010)

File format	Number of files (%)	Used space (%)
.doc (Word)	78.6	46.4
.dot (Word)	1.7	0.6
.xls (Excel)	17.7	19.2
.ppt (PowerPoint)	1.5	22.2
.mdb (Access)	0.2	10.9
.vsd (Visio)	0.07	0.25
.mpp (Project)	0.03	0.05
.pub (Publisher)	0.2	0.4

The conclusion of our survey and our recommendations to the Canton of Vaud was thus to adopt OOXML as a standard, as long as .odt (ODF word processing) and .ods (ODF spreadsheet) are well under 10% of usage.

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References

- Blind, K. (2011). An economic analysis of standards competition: The example of the ISO ODF and OOXML standards. *Telecommunications Policy*, 35(4), 373-381. doi: 10.1016/j.telpol.2011.02.007
- Casson, T., & Ryan, P. (2006) Open Standards, Open Source Adoption in the Public Sector, and Their Relationship to Microsoft’s Market Dominance. In: S. Bolin (Ed.) *Standards Edge: Unifier or Divider?* Sheridan Books, p. 87-99. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1656616

- Eckert, K.-P., Ziesing, J. H., & Ishionwu, U. (2009). Document Interoperability - Open Document Format and Office Open XML Fraunhofer-Institute for Open Communication Systems FOKUS. Retrieved from <http://publica.fraunhofer.de/eprints/urn:nbn:de:0011-n-1047639.pdf>
- Office Open XML Adoption. *Wikipedia*. Retrieved from http://en.wikipedia.org/wiki/Office_Open_XML_-_Adoption
- OpenDocument Adoption. *Wikipedia*. Retrieved from Wikipedia website: http://en.wikipedia.org/wiki/OpenDocument_adoption
- Ryan, P. (2010). ISO OOXML convener: Microsoft's format "heading for failure". *Ars Technica*. Retrieved from <http://arstechnica.com/microsoft/news/2010/04/iso-ooxml-convener-microsofts-format-heading-for-failure.ars>
- Shah, R., & Kesan, J. P. (2008). Lost in Translation: Interoperability Issues for Open Standards. *The Proceedings of the 36th Research Conference on Communication, Information and Internet Policy (TPRC)*, Arlington, VA, Sept. 26-28, 2008.
- Thomas H. (2010). International OpenOffice market shares. Retrieved 10.10.2012, from <http://www.webmasterpro.de/portal/news/2010/02/05/international-openoffice-market-shares.html>
- Valoris. (2003). Comparative assessment of Open Documents Formats Market Overview. Retrieved from <http://xml.coverpages.org/IDA-TAC-ValorisRec1928.pdf>

The e-Cohesion Concept - the Introduction of an On-Line System for the Submission and Evaluation of Applications for the Access to E.U. Structural Funds

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Abstract: The e-cohesion concept is a new concept introduced within the European Union's policy documents issued in October 2011 for the new financial period of 2013 - 2020 regarding the use of Structural Funds. The concept itself is not yet defined in the proposals for legislative documents and there are not neither any clear measures suggested to the Member States, nor targets for its implementation. The concept is undoubtedly related with the simplification of the management procedures, targeting the submission electronically of all documents requested to the applicants. The main solutions suggested are the digitization of the management authorities, but also the extension of the electronic signature system and the increase of the on-line security for these operations. These developments will engage hopefully a cut of red-tape, the avoidance of duplication and environment friendly procedures. This article intends to contribute to the academic debate related to this new concept and to research how the implementation of the e-cohesion concept might challenge the present systems. A short inventory of some good practices that have already been implemented in several Member States will present an insight on steps already made in this field.

Keywords: e-Cohesion, structural funds, innovation, regional policy, eGovernment

1. Introduction

In 2010 the European Commission addressed to the Parliament and to the Council a Communication entitled *“Europe 2020 Flagship Initiative - Innovation Union”* with the intention to attract the attention towards the fulfilment of the Europe 2020 strategic priorities whose core is innovation (European Commission 2010). According to statistics, Europe is not performing very well in comparison with USA and Japan, jet China, as a fast developing country. Budgets for research and innovation in Europe are hardly reaching the target of 3% of GDP, currently E.U. average laying around 1.8 %. The Europe is not only missing the financial support for innovation in times of financial crisis (but not necessarily directly related to it), but also an integrated strategic approach towards development and growth through investment in innovation, ICTs, research and higher education. In the 3rd millennium, it has become more than urgent for Europe to take measures to catch up with the innovative world leaders and to face the global challenges of today, such as climate change, energy and resource scarcity, health and ageing.

The European Union itself has to start to prove example of implementing innovative measures of eGovernment by *undressing* the coat of bureaucratic giant that has been created over the years and to issue fast and flexible models of decision-making and decision implementation, especially in terms of financial support. We refer here mainly at the use of Structural Funds and of Framework Program for Innovation as the main E.U. financial supports for development, research and innovation. The access to E.U. funds must be simplified and concentrated on results' delivery and not on control, in order to maximize their impact and added-value. *“Researchers and innovators should spend more time in the lab or doing business and less on paperwork”* (European Commission 2010, p. 12).

A Europe of economic, social and territorial cohesion should be supported by innovation while innovation is spread at all territorial levels. This would be translated by the integration of research and innovation within all the E.U. funding programs, including the Cohesion Funds allowing all the regions to have access to them, to implement their results, to promote them and to become leaders and drivers of innovative measures of development. This might be very well contributing partly to the creation of the e-cohesion concept, targeting the equal distribution of innovation among the regions of the European Union.

Looking through the reform proposals of the cohesion policy, one can easily notice the almost obsessive mentioning of the *innovative* term: an *innovative* concentration on core priorities; promoting additional, *innovative* and flexible spending; addressing the efficiency objective: the case of *innovation*

(Barca, 2009, p. 126). Indeed, the policy itself needs to introduce new tools to become more efficient in its creation, management and evaluation and monitoring.

Undoubtedly, the concept of e-cohesion is closely related with the target of investing minimum 3% of EU's GDP in innovation, research and development set by the Europe 2020 Strategy, the European Union prioritizing projects regarding the development of new technologies and high-speed Internet access. The implementation of this concept is regarded as having a double meaning: a political and a technical one. By adopting the e-cohesion concept, the E.U. is "practising what it is preaching" that means the implementation of eGovernment services, the Digital Agenda in Cohesion policy management and the reduction of administrative burdens for beneficiaries. On the technical side, the e-cohesion should encourage the digitization between the administrations and the beneficiaries, creating and enhancing electronic portals as well as the suppression of parallel paper flows.

2. Discussion on the meaning of e-cohesion

Since there is no available definition on the e-cohesion, as a new concept introduced in the E.U. policy documents, we propose to look to this concept from different perspectives before researching on the meaning suggested by the European Commission. Nevertheless, all the three dimensions might be very well taken together.

1 The e-cohesion as a development strategy

2 The e-cohesion as a tool to enhance innovation at regional level

3 The e-cohesion as a tool to implement the European and national e-governance

1. The e-cohesion as a development strategy

The European Union has traditionally based its development strategy on agriculture and social and economic cohesion and funds have been dedicated to support these development priorities. These priorities have engaged more than 80% of the E.U. budget, the balance being in the beginning inclined for agricultural spending while today targets equilibrium, the spending for sustainable growth surpassing just with few percentages the one for preservation and management of natural resources. Innovation is being financed through the sustainable growth budget heading. As part of the cohesion subheading, innovation accounts today 24% of the spending, in real terms around 84 billion Euros. Additionally, under the competitiveness subheading, the research and innovation policy benefits of a financing of 50.5 billion Euros through the Seventh Framework Program 2007-2013 (FPRD7). There are also suggestions to include innovation as a separate item in the E.U. budget.

Most policy documents of the E.U. acknowledge how important innovation has become in all fields of activity and call for a higher allocation of funds both at national and European level. The achievement of the cohesion policy objective, that of the overall harmonious development and of the reduction of disparities between the levels of development of the E.U. regions has been difficult to attain over the 20 years of regional policy history and distribution of funds towards less developed regions has not yet proved to be fully efficient, as the spending of most of the money has had a rather distributive character than a one targeted towards sustainable growth. As the modern growth theory suggests, integration leads to greater regional disparities, which explains why more prosperous regions enjoy on-going long-term growth, among the growth factors being mentioned the investment in R&D and innovation (cited in Nello, p. 350). An e-cohesion policy would therefore *drag* the innovation character to the core of the allocation of the financing, imposing to each project to prove its innovative added-value and its capacity to promote long term sustainable results.

Cohesion and innovation policy would enforce each other in the common goal to support long-term development in all the regions of the EU. Even if FPRD7 and the Structural Funds rationale are different, there are still possibilities to coordinate them on a complementary funding base by financing different sets of actions and related costs, in such a way that they could mutually reinforce their effects and help to achieve better and more sustainable results, as the regional dimension has been highly emphasized in both policy areas: research and cohesion alike.

2. The e-cohesion as a tool to enhance innovation at regional level

There are 274 N.U.T.S. regions in the E.U. (the European statistical classification system of the development regions) that are so much different from one another due to their specific location, history, development, opportunities, legislation. They show different growth rates and development paths in R&D based on their specific tradition, access to financing and investment opportunities. In recent years, positive trends can be observed for new Member States such as Estonia, the Czech Republic or Slovenia (e European Commission 2011), while in other countries R&D spending is slow and very low, accounting for less than 1% of GDP (Gross Domestic Product). Even if there are positive developments in some countries and regions from the E.U.27, these are not likely to influence the overall performance of the E.U. as a whole. It is likely that those regions surrounding capital cities to be the most innovative, as well those benefiting from traditionally strong business and academic research centres. There is a strong innovation polarisation: the presence of technological hotspots is accompanied by a high number of regions with low or very low performance. Many of the regions located physically on the outskirts of Europe or farthest from the European centre, appear to lag behind in research and innovation (Barca 2009).

This is a reality that is proving that integrated markets can lead to even greater regional disparities, as knowledge and innovation will tend to concentrate in certain areas and more prosperous areas will enjoy ongoing long-term growth due to growth factors, such as: market access, human capital and investment in R&D. Access to financing is not self-sufficient as such, the regions need to have the capability to absorb this financing with sustainable projects.

Following the "Europe of Regions" approach, initiatives to promote regions' profile beyond the Member States ubiquitous presence on the E.U. arena have been emerged culminating with the "OPEN DAYS – European Week of Regions" which takes place every year. Regions have been put by the European Commission (EC) in the centre of attention and dedicated Communications for regions have been issued as well as dedicated financing lines have been drawn up, such as the Regions of Knowledge financing line from the FPRD7. Their aim is to promote regional economic development in order to strengthen the research potential of European regions and increase their participation in the *European Research Area*, in particular by supporting the cooperation, across Europe, of regional "research-driven clusters". These clusters are concentrations of research entities, business entities, regional/local authorities, the so-called "triple-helix" (e European Commission 2011) and where appropriate other local entities such as chambers of commerce, banks, and intermediaries such as technology transfer offices or science parks, operating in a particular scientific and technological domain or economic sector.

This illustrates that the European Commission is encouraging a rather bottom – up policy initiative and favouring the development of the multi-level governance across Europe, promoting the regions as the leading growth engine of the European economy. Therefore, e-cohesion might be regarded to as a policy to enhance the innovation potential of European regions as drivers of development. The European Commission considers that nowadays too much funding is allocated to overlapping projects or to priorities where regions lack relative strengths. Funding has to be redirected towards a *smart specialisation* approach and focus on relative strengths where they can become excellent. (d European Commission, 2011, p. 21)

3. The e-cohesion as a tool to implement the European and national e-governance

The main information that we have regarding the e-cohesion concept is the article 112 of the new policy document mentioned above which refers to the responsibilities of the Member States in the management and control systems of the Structural Funds. According to this article, the Member States should ensure that no later than 31 of December 2014 all exchange of information between beneficiaries and all authorities involved in management, certification, auditing, selection and evaluation of applications will be carried out solely by means of electronic data exchange systems. These systems should also ensure the interoperability with national and E.U. frameworks and allow the beneficiaries to submit the needed documentation just once.

There is a clear standpoint that the introduction of innovative management systems for the administration of Structural Funds has to start from the very top, including the European Commission and the national management authorities. They are the ones to create and to promote the proper environment for the electronic submission and evaluation of applications, as well as on-line support for applicants and beneficiaries. These procedures should go along with a simplification process and

cut of red-tape becoming more user-friendly especially for SMEs that will surely get more encouraged and keen to submit applications due to a clearer and faster access to information. It is well known that difficult access to co-financing but also long-run and bureaucratic procedures for the access to European funds make most of the companies give up submitting any kind of project or projects are abandoned during their implementation.

In its recently issued policy document, entitled “Cohesion Policy 2014 – 2020 Investing in Growth and Jobs”, the European Commission acknowledges that “electronic data management can seriously reduce administrative burden, while increasing the controllability of projects and expenditure” and sets for the Member States a deadline of 2014 to implement a system that would permit the beneficiaries of funds to provide all the needed information by electronic means (c. European Commission, 2011, p. 9).

Analysing this message, one can notice that the European Commission refers only to the projects that have been already approved for financing and are in the implementation phase but we consider that the Member States should be as well encouraged to introduce electronic submittal of projects while implementing the electronic signature regulations. This message is addressed mainly to the management authorities, be they of national or regional level.

3. Several examples of good practices

For the purpose of our research, we have investigated some examples from different member states. The information has been obtained basically on data identified on the web pages of national or regional managing authorities and intermediate bodies, as they have been officially presented on the internet page of the European Commission (www.europa.eu).

We have gathered data from the following countries: Romania, United Kingdom, France, Germany and Lithuania. The information available on line that has been analysed refers to the availability of primary information, for example about the E.U. regional policy, Structural Funds, national implementing regulations, but also specific information such as calls for projects, submittal of projects, implementing guidelines for beneficiaries etc. Most of the management authorities provide a rather good access to such information but there is still room for improvement. From the researcher point of view, access to information has been restricted due to language barriers, as the most detailed information is in the national language.

The research has targeted to gather information about the following topics: the availability of the on-line submittal of projects and of any electronic support for the beneficiaries from the part of the specialists and of an electronic system for data exchange between beneficiaries and management authorities and for documents' management during implementation phase.

On line submittal of projects is available in some member states but it is conditioned in most of the cases by a preliminary registration on the basis of a username and password (for example, Romania, the Management Authority for the Operational Programme for the Increase of Economic Competitiveness). The Management Authority for the Operational Program for the Development of Human Resources has developed among the first ones in Romania an on-line application called ACTIONWEB that allows the applicants to submit their projects on line in a user-friendly environment.

In Scotland, the potential applicants are required to complete an on-line registration form before they are able to submit a formal application through EUROSYS (the Scottish Government European Structural Funds System). The system is especially designed to manage and process EU Structural Funds applications and approvals for the period 2007 – 2013 and is equally used to monitor the progress of the implementation process of the financing. Even if electronic submittal is available, hard copies of documents are still compulsory (Romania) or requested by the Management Authority if needed (Scotland).

In Romania, even if the project is submitted on line, the applicant is given a deadline to provide all the documents, including the application itself, in written. In West Midlands, U.K., the applicant is also requested to provide a hard copy of his on-line submitted project but if there are discrepancies between the two the application is returned for rework. The electronic versions have to be read-only or protected against modifications.

The Welsh European Funding Office (WEFO) which is managing the regional operational program for Wales, U.K. gives the possibility to applicants to initially submit on line an Expression of Interest and within 5 days the applicant is contacted by a Project Development Officer in order to help with the project proposal. The application is available on line on the web site and may take up to five minutes to fill it in. The requested information is related to the contact data, name of the project idea and the strategic framework. This possibility has a customer oriented approach, providing advice and support through the procedures but also avoids that irrelevant projects are submitted and time is lost with the evaluation of such projects.

In Thüringen, Germany, the applicants are given the possibility to submit their projects' investment on a dedicated portal developed by the Thüringen Development Bank which is managing all the investment projects from the region on the basis of a cooperation agreement with the administrative authority. The portal requests secured access with username and password.

Even if electronic documents are accepted, as nowadays most documents are issued electronically and do not have a paper version, there is still specified that such electronic documents have to be kept in the same secured environment as paper copies and for the same duration.

In terms of advice, support and training for potential applicants, the managing authorities are offering tools such as free telephone help line, help desk by email or multimedia e-learning applications. Other range of services offered is hosting on the website of a special section where applicants have the possibility to post project ideas that could be visible for other possible applicants, giving the chance for networking and collaboration between common interested parties. A noticeable initiative in Wales is the creation of a dedicated web site for public tenders that SMEs can easily access while looking for public contracts. Since its inception, the website has published a value of more than 5 billion pounds of notices, making the market of public tenders more available to the private companies (www.sell2wales.co.uk).

Regarding the electronic system for data exchange between beneficiaries and management authorities and for documents' management during implementation phase a remarkable initiative have been identified in Lithuania which has such a system. The system is used only for the implementation and monitoring phase of the project, the online submission being not available. The access to the system is provided only on the basis of a financing contract, and it is secured by codes and passwords sent to the project administrator by registered mail. The project promoters have the possibility to request to the implementing agencies the following information: how much money is spent and how much still remained in the project's budget; what indicators have been reached, what activities have already been executed; how many requests for payment are submitted, how many of them adopted and how much paid; what are the costs considered eligible, and if not - what are the causes of non-recognition etc. The project promoters can also fill in, and request the implementing agencies to provide an advance payment requests and receive notifications about the requests for payment.

4. Observations and proposals

Electronic management systems could be also introduced by the management authorities in the process of selection of the evaluators, in order to ensure that the evaluators are chosen randomly by the computer and they would not have any personal interest in a certain project evaluation.

There is still place for improving the service delivery for applicants and beneficiaries using the on line real-time communication tools and well as introducing platforms of information exchange among different applicants on the web sites of the managing authorities or of the implementing bodies that are open to comments and discussions. A more use of web forms instead of portable document formats would make the application more interactive and user-friendly.

There are types of projects where a total digitization of the project will not be possible, for example big strategic environmental projects which request a lot of documentation and field visits. One has also to consider the present reality that access to internet in Europe is still restricted in disadvantage regions, such as rural or mountain areas and the efforts to introduce electronic systems of project management have to go hand in hand with the efforts to create broadband networks or mobile internet access according to the requirements of the Digital Agenda for Europe whose aim is to ensure that by 2020 all Europeans should have access to Internet at speeds above 30Mbit/s and 50%

or more of European households should have subscriptions above 100 Mbit/s. (e. European Commission, 2011).

The implementation of the e-signature at national level might help lowering the costs and simplifying the systems, if a rule of submitting all documents only electronically would be enforced. The two work flows of today, electronic and paper, present in some systems create additional complexity, duplicated work and bureaucracy.

This concept should be compatible with the creation of a unique European portal for applicants all over Europe as well as of a European-wide electronic archive of all ever financed projects with Structural Funds allowing a faster, simpler and more open access to information regarding the use of European financing for different actors: beneficiaries, management authorities, European Commission, mass-media etc.

5. Challenges and recommendations

There are still steps to be taken to achieve the e-cohesion concept as drawn by the E.C. and the 2014 target might very well be too ambitious for the Member States and become a time restriction in exchange. There are views that suggest that the deadline should be extended to 31 of December 2015 as the Member States will not be able to select in due time the Operators who will manage the new data exchange systems. Nevertheless, efforts in this field are made by the management authorities as there are clear advantages of introducing electronic data management systems both for applicants, evaluators and management authorities' specialists. In this respect, a good contribution to the process can be represented by the exchange of good practices and sharing experiences by looking into other domains (such as eProcurement) or same domain but in different regions of the E.U.

A political challenge might influence the acceptance and implementation of the e-Cohesion by different Member States due either to the stage of the technical development of their national systems or to the reluctance related to security and interconnection with the European system. In this respect, the E.C. recommends to put in place a task-force, as a centre of excellence, for the support of the implementation of the e-Cohesion which would encourage the active participation of Member States and increase credibility and transparency in the interoperability of the European data exchange system. Challenging might also be the creation of interregional electronic platforms and sharing of costs in the framework of the European Territorial Cooperation projects which counts partners from different states located in border regions (Wittenberg Conference 2011).

The implementation of the e-cohesion might as well have an impact at the organisational level, as a higher digitization might require a stronger technical professionalization of the management authorities but as well a reorganisation even reduction of departments and personnel. In a more complex management structure might be difficult to maintain and update the systems, so it is recommended to avoid setting up more than two levels of monitoring systems for the funds (Wittenberg Conference 2011).

Changes in legislation of the Member States might occur due to the demands of implementing the e-cohesion. Impact on legislation might vary from low to high depending on the digitization of the country itself and the use and acceptance of e-services in the public life (see model of e-Estonia). Legislation needs to be issued or amended regarding the legal recognition of digital documents, especially for audit purposes. Similarly, national laws on personal data protection that might influence the successful implementation of the e-cohesion will need to be adjusted accordingly.

Financing the e-cohesion will challenge the national budgets in the next years. Technical assistance operational programmes financed by Structural Funds are the main tools that the management authorities can use for introducing electronic data management systems but these programmes have already been approved for the period 2007 - 2013 and are during implementation phase. The deadline of 2014 is therefore too tight if to use the possibilities offered by the Structural Funds and the management authorities are likely to search for other potential financing sources, for examples with the use of own governmental public investments, public – private partnerships or support from other international financing institutions.

6. Conclusion and future research

One might wonder if there was a need for “electronization” of the Cohesion in order to attract the attention that there is an acute need to innovate in the field of regional policy and the management of structural funds. Even if going digital is the trend of the 3rd millennium, realities in the European regions might slow down the e-cohesion euphoria, as there are still places in Europe where Internet and use of IT systems, as main technical requirements, are not available.

There are question marks if the implementation of the e-cohesion will impact positively on the performance of management authorities and when this will happen and ultimately, if it will increase the overall effectiveness of the E.U.’s structural funds management and of the regional policy as a whole. The “e-cohesion” will not be more uniform across the E.U. than the (simple) cohesion is nowadays, since one can already notice different levels of acceptance and use of electronic data management systems in Member States, according to their traditions, organisation and legislations. Future research is therefore open related to the effectiveness of already implemented regional and national digitization projects in the field of structural funds management.

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References

- Barca, F. (2009) An Agenda for a Reformed Cohesion Policy, Independent Report, European Communities, Belgium
Department for Communities and Local Government, A Funding Guide – European Regional Development Fund (ERDF) Programme 2007 – 2013 [online], www.communities.gov.uk (accessed on 09.01.2012)
- European Commission (2011) Cohesion Policy 2014 – 2020 Investing in Growth and Jobs, Luxembourg, Publications Office of the European Union, [online]
http://ec.europa.eu/regional_policy/sources/docoffic/official/regulation/pdf/2014/proposals/regulation2014_leafler_en.pdf (accessed on 09.01.2012)
- European Commission (2010) Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Europe 2020 Flagship Initiative, Innovation Union [online] ec.europa.eu/enterprise/policies/innovation/policy/innovation-union/communication/iu_en.pdf (accessed on 04.01.2012)
- European Commission (2011) Cohesion policy and regional research and innovation potential - An analysis of the effects of Structural Funds support for Research, Technological Development and Innovation 2000-2010 [online], http://ec.europa.eu/invest-in-research/pdf/download_en/rkf5th_brochure.pdf (accessed on 04.01.2012)
- European Commission (2011) Guide to Broadband Investment Final Report, [online]
http://ec.europa.eu/regional_policy/sources/docgener/presenta/broadband2011/broadband2011_en.pdf (accessed 11.01.2012)
- Nello, S.S. (2009) The European Union: Economics, Policies and History 2nd edition, McGraw-Hill Education, Maidenhead, UK
- Wittenberg 2011, IT-Systems and Cohesion Period 2014 +, Conference Final Paper [online],
http://www.wittenberg2011.de/sally/data/mediapool/111019_it-conference_final-report_book.pdf [accessed on 22.02.2012]
- http://ec.europa.eu/regional_policy/manage/authority/authority_en.cfm [accessed on 10.01.2012]
- www.sell2wales.co.uk [accessed on 10.01.2012]
- <https://www.eurosys.scotland.gov.uk/Eurosys/Public/Home.aspx> [accessed on 10.01.2012]
- <http://www.fonds-europeens-alsace.eu/> [accessed on 10.01.2012]
- <http://www.thuringen.de/eu> [accessed on 10.01.2012]
- <https://portal.aufbaubank.de> [accessed on 10.01.2012]
- <http://www.esparama.it/2007-2013/en/5> [accessed on 10.01.2012]
- <http://www.fseromania.ro/index.php/aplica/actionweb> [accessed on 10.01.2012]

Climate Change Policy in Australia: Contexts and Consultation on the Clean Energy Legislative Package (2011)

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Abstract: On November 8, 2011, a minority Australian Labor government, with the help of Green and Independent MPs, successfully passed a Clean Energy Legislative Package through the Federal Senate. The substance of the individual bills – ranging from levy impositions on greenhouse gas to fuel tax legislation – had ignited stormy public controversy. Advocates on both sides of the climate change debate emerged, as the Australian legislation proposed a carbon levy for the first time. The proposed legislation was acknowledged as globally significant, although similar environment policy had been enacted in Switzerland and Sweden. The department responsible for running the public consultations, the Department of Climate Change and Energy Efficiency (DCCEE), was newly established as an agency in its own right in 2010, as part of ‘Machinery of Government’ changes: responsible for a broad portfolio of climate change policies and implementation, including community, household and business sector climate action, and a remit to contribute to a global climate change solution. Its role is educative as well as instrumental. DCCEE meets freedom of information legislation and transparency expectations, and supports public consultations through rich information provided in an ongoing context of lobbying and misinformation. Using public domain material, the paper assesses the management of the complex online consultation, beginning by contextualizing the international and local policy contexts. It notes significant characteristics in DCCEE’s stewardship: achieving transparency and equity, and setting parameters for citizen input. It assesses why seemingly more conservative means were deployed to engage citizens in consultations over a multi-segmented and contentious piece of legislation, designed to effect radical social and economic change.

Keywords: climate change, policy consultation, contentious issues, transparency, green citizenship

1. Introduction

In 2011, specific national energy issues, as well as international events, policy initiatives and politics influenced Australian policy consultation processes on clean energy. This paper aims to account for the factors involved in the Department of Climate Change and Energy Efficiency (DCCEE) consultation approach, prior to the successful passage of the Commonwealth’s Clean Energy Legislative package in 2011.

The Australian policy package, including measures ranging from levy impositions on greenhouse gas to fuel tax legislation, has been hailed as an exemplary achievement globally. The fact that it comes from one of the countries with high pollution ranking per capita is a measure of its significance. National reductions of expected emissions by 2050 include: 90% of expected waste emissions; 76% of expected electricity emissions; 62% of expected fugitive emissions; and 53% of expected industrial process emissions. The administration of the Clean Energy Act begins on April 2, 2012, and ‘to help households get ready for the modest impact of a carbon price, household assistance payments will start in May and June 2012’ (Clean Energy Future 2012). It will thus result in major social, structural and industry change.

The 2011 draft policy consultation processes for the Clean Energy Legislation were submission-based, inclusive, informative, and attempted to mitigate the controversies and conflicts associated with the regulation of clean energy production, by provision of an online information-rich draft policy space, which was transparently and efficiently ordered. The legislation and consequently the consultation formats required were extensive and interconnected, involving multiple and unequally powerful stakeholders in a series of consultations on policy specifics, some of which were of a highly technical nature.

Australian governments’ have experimented extensively with methods of policy co-creation, and the public service has formally canvassed the concept of citizen partnership in policy formation. DCCEE consultations did not use more experimental methods of consultation, such as blogs for the open-ended sourcing of ideas from ‘creative citizens’. The consultations took a traditional form in 2011: the scale and complexity of the proposed legislation required a matching approach. The package of consultations in 2011 is listed in Figure 1.

2011 submissions		
Date closed	Type	Details
2011-12-06	Consultation	Energy Efficiency Information Grants: proposed grant design
2011-11-25	Discussion paper	Adjustment and publication of energy consumption: NGERs
2011-11-14	Exposure draft	Australian National Registry of Emissions Units Act 2011
2011-11-11	Exposure draft	Renewable Energy Target (RET) regulations
2011-11-09	Consultation	CFI offset methodologies: Fuel waste for manufacture
2011-10-28	Consultation	Clean Energy Regulations 2011
2011-10-21	Consultation	Community Energy Efficiency Program: proposed program design
2011-10-21	Consultation	Low Income Energy Efficiency Program: proposed program design
2011-10-12	Discussion paper	National Carbon Offset Standard
2011-09-16	Draft regulations	Positive and negative lists for the Carbon Farming Initiative
2011-09-15	Consultation	Registration fee increase for the STCs from small scale generation units
2011-09-12	Consultation	Residential Building Mandatory Disclosure proposed measure
2011-09-09	Consultation	Enabling Indigenous participation in the Carbon Farming Initiative
2011-09-09	Consultation	Clean Energy Legislative Package
2011-08-18	Consultation	Draft Greenhouse and Energy Minimum Standards (GEMS) Bill
2011-06-30	Consultation	Positive and negative lists for the Carbon Farming Initiative
2011-06-30	Consultation	CFI methodologies: Savanna burning
2011-06-30	Consultation	CFI methodologies: Management of large feral herbivores
2011-05-31	Consultation	National Greenhouse and Energy Reporting (Measurement) Determination
2011-05-10	Consultation	Proposed architecture and implementation arrangements for a carbon pricing mechanism
2011-03-24	Consultation	Proposed design of the Carbon Farming Initiative
2011-03-24	Consultation	Tax Breaks for Green Buildings
2011-02-01	Consultation	NGER Supplementary guidelines

Figure 1: Source: <http://www.climatechange.gov.au/government/submissions/closed-consultations.aspx>

Significant features online were the links to other relevant government sites, which provided rich specific information both textually, and in visualizations, to assist the writing of stakeholder submissions. One such example is the 'core policy scenario' offered by the Australian Treasury modeling a medium global action scenario, which came up with the initial price of A\$20/tCO₂-e in macroeconomic modeling and A\$23/tCO₂-e for households (The Treasury, 2011).

The argument will be offered that, despite the tight structuring, and difficult terms and abstract concepts, the process of citizen consultation through submission in controversial matters can be productive and educative, not only for more deepening understanding of the economic complexity of the issues involved in national environmental policy-making, but for clarifying understandings of the different value frameworks cross-sector. It may be also be a point at which values are mediated.

The paper has three sections: the international climate change policy context; national policy priorities; and the governance of the 2011 online consultation process.

2. The international climate change policy context

Climate change policy emerges from scientifically based understandings that human activity is accelerating the earth's warming, through its manufacture of excess gas emissions. Left unchecked the trend to global warming will continue, and it will worsen the pattern of extreme ranges of temperature, and increase the negative effects of unpredictable rainfalls or lack of rain and thus the potentially disastrous outcomes of water shortages, unmanageable food supplies, and dangers to coastline settlements, and eco-systems, from the predicted rise of ocean levels (Joint Science Academies 2006). The responsibility for human-caused risks is borne primarily by the industrialized nations. Non-experts, uninformed about the science, sometimes find it difficult to make the links between extreme climate events experienced locally, which, while appearing to be isolated unconnected incidents, form discernible patterns of threat to settlements, and ecosystems (Climate Institute, 2011).

However, climate change is regarded as a pressing pan-global issue in international governance. As well as forming the substance of international decisions at the national and local level, climate change responses include individual lifestyle changes. 'Green thinking' is also promoted and sustained by government, business innovation and activist intervention across global populations, not only in the 'greener' industrial regions, cities or precincts, the living laboratories of a new kind of multinational

and multilevel participation in 'green citizenship' and ethics (Duffy, 2011; Norman, 2010; Australian National Greenhouse Accounts, 2008; *Solar Cities*, 2011; Energy Rating, 2012; Green Plumbers, 2012), but everywhere.

Climate change is thus a significant governance question for which policy solutions are being explored. However, making effective, binding agreements on climate change is proving notoriously difficult to sustain at the international level, and conflict flows to national and local debates and policy consultations. The perceived problems begin with the history of the international attempt to get rapid and concerted policy action. The Kyoto Protocol, first signed in 1997 in Japan (Kyoto, n.d.), is seen as 'an historic milestone' in environmental policy by leading environmentalists such as Suzuki (2010); and a place for international politics between major powers, including China as an emerging giant whose economic strength currently depends on dirty industry; and as having the potential for conflicts of interests between developed nations and more vulnerable ones such as those represented by the Association of Small Island States (AOSIS) and Least Developed Countries (LDCs). Scientific critics of the findings of UN's International Panel on Climate Change (IPCC), on which the Protocol is based, quickly began their attack on the making of policy based on disputed scientific evidence (Gerholm, 1997).

Global opposition continues (McCright and Dunlop, 2003) and peer challenges to scientific findings further muddies public discourse about scientific reliability; and the need for policy implementing strict environmental measures, especially ones involving taxpayers in increased levies. Kyoto measures have been criticized, although the Protocol is an international agreement legitimated by the United Nations Framework Convention on Climate Change, requiring the signatories of 37 industrialized countries and the European community to reduce carbon emissions by five per cent over the 2008-2012 period against 1990 levels (UNFCCC). 184 nations have signed for the period 2008-2012, yet the Protocol (due to expire in 2012) was seen - from public reception of the 2007 Bali Road Map - as not sufficiently capable of providing lasting and real policy impact at national levels, which would make a significant difference to greenhouse gas levels. The climate change debate tends to be dominated by developed countries, where the mechanisms offered by the Protocol to produce reductions are likely to cause diverse local implementation difficulties; and confusions in mutual understandings about factors involved in public policy consultations. The mechanisms underpinning the Protocol include emissions trading and clean development mechanisms; and joint implementation imposes interpretive challenges in public consultations.

2.1 Abstract concepts and achieving consensus

The first of these, emissions trading, is the most abstract concept for changing hearts and minds at national level. But, selling the need for higher taxes to an electorate to fund complicated international exchanges of carbon debt, along with convincing populations to buy more expensive energy technology, and fuel, are not the only issues that face local climate change policy makers. In a comparative study of climate change policy development in Canadian states and provinces (Kabe 2007) it was argued that an 'exploration of "smart practices" at the national and subnational level had barely begun' and had been 'largely eclipsed in the quest to establish "best possible practice" based on gaping assumptions concerning political will, institutional and technological transformation in a largely untested arena of policy' could guide and establish best practice. Kabe saw that among the many Canadian 'overtures', a policy gap existed in defining and setting realistic goals, and in identifying what worked well and was transferable. The existence of isolated local innovations coupled with relatively few coordinated approaches could mean citizen perceptions that 'enough is being done' on the climate change front, especially among those not experiencing, for example, Beijing's regularly reported high levels of pollution, or those who are not living on the small pacific islands losing their land to rising sea levels.

Climate policy research on risk perception and affect through image analysis (Leiserowitz, 2007) suggests a critical factor for success: the design and discursive framing of policy consultations. A call for greater policy pragmatism was provided by a scientist involved in 'climategate' in 2009. He argued that a noticeable shift in policy-making assumptions demonstrates that what is really at stake in policy consideration is an understanding that 'policy is made in the language of politics, values and ethics rather than the one-dimensional language of scientific consensus or lack thereof.' Further, that the longitudinal re-analysis of climate data being undertaken and released by, for example, the UK's Meteorological Office, could lead to more careful policy formation. In particular, it could lead to the pragmatic question that should be asked by policy-makers: 'What combination of contested political

values, diverse human ideals and emergent scientific evidence can drive climate policy?’ (Hulme 2010).

Australia is a good example of a country facing the similar, but locally ‘differentiated’, issues mentioned by the UN in its comparison of the contrasts in challenges which countries face. Politically, Australia is required to demonstrate responsiveness to international requirements to maintain its influence globally; and, like Canada, it has supported a long list of dispersed, innovative clean energy ‘overtures’ in research and innovation. There is a groundswell of strong public interest in greener cities and cleaner energy lifestyle changes in Australian cities, and in the Australian education curriculum (Greening Australia, 2011; Living Greener, 2011).

3. National priorities

Yet this complex of issues made DCCEE’s task challenging. Add to the mix, the pragmatism needed, given the factors involved in multi-agency and multi-level coordination; and the requirement to address, and focus stakeholder attention on, the detail of specific Bills. Local priorities, different stakeholder groups, expert contributors and non-experts, and contested values impact in idiosyncratic ways on clean energy considerations, as reflected in the 2011 consultation design, and in submissions from the public.

Climate change policy addresses multiple scientific, economic, social issues (Garnaut, 2011). The scale and complexity first needs to be understood by a population. With current ‘per-person emissions larger than those of the United States and twice those of Germany’ (Petherick 2011), Australia has specific factors to consider: a long coastline where its major cities, industry and infrastructure are primarily located and where government estimates of potential exposure to asset losses due to ‘inundation and erosion at sea level’ run to \$AUD 226 billion (Climate Change Risks, DCCEE 2011). As well, despite being used to droughts, floods and bushfires, Australia has experienced the effects of extremes of climate change in 2010 with intense storm events and flood damage effects (e.g., Cyclone Yasi, Cyclone Larry, Black Saturday bushfires). The effects are socially, financially and physically destructive. The psychological damage and insurance costs are noted by the CEO of The Climate Institute, who remarks: ‘If you want a picture of a what a hostile and costly environment looks like, we’ve had it in spades over the past couple of years’ (The Climate Institute, 2011). Connecting the dots between this local disaster and the need for policy change presents a significant informational and governance challenge.

The primary Australian industries of farming and mining have powerfully vocal lobbies, and anti-carbon tax perspectives gained influential opinion leaders’ support in the mainstream national media. Farmers, conservationists and aboriginal people have nevertheless become partners in land restoration, e.g. the ‘Gondwana Link’ in southwestern Australia, which is an ambitious conservation project, returning land destroyed by farm clearing practices into a biodiversity hotspot (Greening Australia 2011). Though, overall, mining and farming practices, as well as waste landfill, contribute to greenhouse emissions by producing methane. The business, industry and infrastructure changes required by green energy imperatives, it is argued by those stakeholders, will impact on revenue, and may not return on investment quickly enough.

An additional Australian factor - but perhaps one shared by other nations - is that, though climate change is a key longer-term internationally-framed issue faced by state and local governments which requires a sustained strategic and ethical commitment, it returns little immediate electoral gain for non-‘green’ mainstream political parties. Within Australian political parties as with the general public, there are climate change deniers on both sides of Parliament. Climate change research has been contentiously used in political campaigns. In 2011 political events – the return of a minority government – required timely passage of the package. The net result in the 2011 Australian public sphere was an emotionally charged and politically intense context in which draft policies on carbon tax and environmental governance were exposed for public consultation.

4. The governance of the 2011 online consultation process

The key climate change responsibilities are coordinated by DCCEE, which has three pillars on which Australia’s ‘comprehensive climate change response is built:

- reducing Australia’s greenhouse gas emissions
- adaptation to the climate change that cannot be avoided

- Shaping a global solution' (DCCEE 2011).

The agency was established (2007) as part of the Department of Environment, Water, Heritage and the Arts, and became a separate portfolio with responsibility for coordination between agencies at all levels, and carriage of international reporting in 2008. It oversees the Office of Renewable Energy Regulator and the Australian Carbon Trust Limited. Its educative function involves advertising clean energy futures to households, businesses and think tanks.

A major Ministerial and agency attempt was made to depoliticize and globalize the debate, and inform policy feedback. In 2010, a National Climate Change Forum was held at which 200 experts debated priorities for Australia in view of the scientific findings. The Minister for the Environment, Penny Wong, challenged the politicization of the scientific disagreements about climate science and policy:

'The simple fact is if you want to reduce carbon pollution at the lowest cost to taxpayers you need an emissions trading scheme like the Carbon Pollution Reduction Scheme. That's why everyone from John Howard to Angela Merkel to Malcolm Turnbull to Barack Obama has embraced emissions trading. And it's why the overwhelming majority of advocates of action on climate change support emissions trading, and everyone who opposes action on climate change is doing everything they can to obstruct emissions trading. Over thirty countries have emissions trading in place and a number of others are working on it.' (Wong 2010)

4.1 Policy design pragmatism

The consultation design for the package (Australian Policy Online, 2011) included a structured comprehensiveness of approach; a centralized information base with good links to relevant material for citizens and those wanting to submit informed comment; the provision of a confidential route for submissions if required; and keeping polemical advocates apart online, by not deploying interactive discussion social media tools. The Digital Economy Blog (2008) is a reminder of how quickly even themed discussion on interconnected issues can go off-topic with detrimental effects (Griffiths, 2009).

4.1.1 Establishing global risk and credentials

The agency website sets its national work in the context of global change, and frames it as one of Australia's highest priorities. It provides links to Kyoto protocol, gives an overview, links to UN's climate change negotiations, and lists all the multilateral, bilateral and regional activities in which Australia is taking lead. The discourses used are of 'responsibility' and care for country. For a citizen or organization coming fresh to the information about the connections of the political, scientific, economic, social and ethical aspects of climate change, this site presents a clear, historicized account of international developments and Australia's contribution to the region, through AusAid, the International Forest Carbon initiative, as a responsible, wealthier neighbor of countries such as Indonesia and PNG. Overviews of the Durban and Cancun negotiation processes are provided. A commentary on China's 12th 5 year plan with regard to reducing emissions shows that Australia is not acting alone and is also a reminder of the country's links to its largest trading partner for fossil fuels. International links works rhetorically to establish credibility and significance.

4.1.2 FAQs on climate change science and economic impact

In terms of detailed advice on climate change disputes, the site also provides FAQs to help 'you decide what is fact and what is fiction'. The issues are covered in a direct fashion: the answers to publicly expressed anxieties, such as 'Are the UNFCCC negotiations trying to establish a World Government' contain links to the UNFCCC website, and reassurances that national sovereignty is not undermined by international pledges. 'Does climate change represent market failure?' draws a response more focused the aims of the proposed legislation:

A 'market failure' in this context refers to the fact that, until now, no one has had to pay for the damage inflicted on our global climate from carbon pollution. If polluters do not pay for the cost of their pollution, that cost is passed directly onto everyone else (for example, in the form of poor air quality or in this case, global warming) That is why the Government seeks to introduce an emissions trading scheme, to ensure that polluters take the whole cost of their pollution into account. This will encourage them to move towards low-emissions alternatives over time' (DCCEE 2011)

The answer to the politics and science question: 'Are the IPCC findings based on a show of hands among political representatives?' is 'No. The Fourth Assessment report of the IPCC provides a rigorous assessment of the published and peer-reviewed research on climate change and was compiled by 1250 expert authors from over 130 countries' (DCCEE 2011). In this routine way, information was coordinated, sorted and targeted. Navigational links are clear.

4.1.3 Maintaining credibility by addressing component parts and giving feedback: exposure drafts

The consultation period on the legislation opened on 28 July and closed on 22 August 2011 with announcements online. It had already been preceded by several targeted consultations addressing the component parts of proposed legislation (Figure 1, above). Summarized, the Clean Energy Legislative Package included four main bills:

- The Clean Energy Bill 2011 (which sets up the carbon price mechanism);
- The Clean Energy Regulator Bill 2011 (which establishes a regulatory body to administer the mechanism);
- The Climate Change Authority Bill 2011 (which establishes a new Authority to advise the government on the future design of the carbon price mechanism) and
- The Clean Energy (Consequential Amendments) Bill 2011. (Australian Policy Online 2011)

There were eventually many others in the whole package, including ones on unit shortfall charges, ozone protection and synthetic greenhouse gas, and excise tariffs. Public debate and earlier feedback was addressed in the exposure drafts posted online.

4.1.4 Public submissions

An e-submission template was provided. DCCEE records that 326 written submissions in total were received. 267 were 'non-confidential', and are now archived alphabetically on the site in downloadable .pdf files, sized from 4kb to 6MB. They originated from individuals, academics and business, environmental and community groups. Many of the submissions were industry-specific, and tackled business concerns in detail and in the technical language required. Individuals' submissions occasionally demonstrated personal values and anxieties such as the pensioner who wrote about wanting to support the carbon tax policy but worrying about the rise in fuel prices, a dilemma called 'ecological ethics' (Curry, 2011). Another wrote informal letters addressed to the Minister Greg Combet, beginning 'Dear Greg' and then launching into bolded text and red font for emphasis:

'I vehemently object on two counts

the science that is used to justify this tax is fraudulent

the tax exposes the Australian citizen to market forces outside Australia who will set & change the

price of carbon and therefore the cost of this tax. ' (Doecke 2011)

Another expressed opposition succinctly 'hi, the best type of carbon tax is No carbon tax. Over 60% of people don't want...Please note China, US doesn't' (Early 2011). A 'citizen' and advocate of vegetarianism (to reduce methane from agriculture livestock) congratulated the government, 'Scientific evidence indicates that coal burning is the number one pollution culprit.... This is the real war – not Vietnam, Iraq or Afghanistan', and quoted Suzuki. (Gordon 2011)

Several groups of personal submissions were identical in their lobbying for no funding to go to the coal-fired power stations, the result of mobilization by activists (a family appears to have signed a set of identically worded letters). A residents' association from one of towns serving one of the dirtiest coal stations in the world wrote asking for the establishment of 'a public interest test...to protect regions and communities deemed at high risk of negative impacts arising from implementation of carbon tax policy.' The Independent Senator from South Australia took the opportunity provided to suggest tighter regulation, and included an academic paper from Frontier Economics to support his argument (Xenophon 2011).

4.1.5 Public submissions from organizations

Corporate submissions were frequently submitted on letterhead, not the DCCEE form provided. Greenpeace and other activist and community groups also advertised their logos and their politics, on

organizational letterhead in the eventually archived online space. Santos and Rio Tinto, the mining companies, wrote extensively, as did the Australian Livestock and Rural Transportation Association (ALRTA). Following the practice of other companies and organizations, ALRTA explained itself: it claimed to be “the first and last” link in the supply chain for Australia’s agricultural industries” (ALRTA 2011). The detailed ALRTA response and diagrams provided on the treatment of feedlots and sale-yards and suggested redefinitions of terms such as ‘fattening’ of cattle for slaughter’ as ‘rearing’ illustrates the specific knowledge and the minutiae of stakeholder concerns. Recommendations from the Australian Trucking Association (ATA) provided five specific amendments to the auditing of charges and taxes (ATA 2011). The industry body stakeholders, such as the Australian Industry Greenhouse Network (AIGN) were able to multiply the separate claims of their individual members (e.g., Santos, Rio Tinto) through collective action. The resulting submissions, though the process was open, appeared to represent the power relations of the preceding public debates, where extensive advocacy campaigns had been funded by certain sectors.

4.1.6 Policy cycle elements

There are two important statements in the ‘Outline of Changes Made since the Exposure Draft Bills’, illustrating the significance of design to successful consultative processes: one is a phrase introducing the documents and refers to the responsiveness of government to citizens’ ideas: ‘To take account of practical issues raised by stakeholders.’ The other is the claim: ‘These changes will enhance public confidence in the integrity of the mechanism, give industry clarity and certainty over their obligations, and ensure regulatory costs are minimized’ (DCCEE 2011). When an effective policy consultation cycle concludes, those who have made submissions should understand that their work in policy formation has been meaningful, even if specific requests are not finally included in policy amendments. The DCCEE feedback on proposed specific amendments, and the publication and archiving of submissions, provides an insight into governance of a challenging climate change policy formation, and also completes the policy cycle for stakeholders. Should citizens wish to return to the detail of submissions and get a sense of other stakeholders’ values and perspectives, reading the documents support the sense of online spaces occupied by citizen participants engaged in the collective input into policy formation. Confidential commentary is unavailable for analysis, and this raises a question: should all submissions, even those impacting on business sustainability or commercial-in-confidence, be ‘open’ to fulfill e-government transparency principles? Submissions would inevitably be restricted in number, or self-censored. Trust in government’s preservation of confidentiality demonstrates strong democracy.

5. Conclusion

Climate change action for the minority Australian government was necessary politically. It was made possible by strong ministerial and departmental leadership, support from Green and Independent Members, and a groundswell of ‘green citizenship’ from parts of industry, communities, activist organizations and individuals. It was equally enabled by opponents’ adversarial submissions: the public debate about climate change science had provided confused information about the salient issues, so the policy consultations clarified, and enabled informed submissions. The political will noted earlier was present and a window of opportunity to be part of a global solution. Australian clean energy draft consultations were set against: high public awareness about global but differentiated problems; some shared vocabulary and public understanding of the issues; an international context of residual controversies about basing policy formation on disputed climate change science, and climate denial media events like ‘climategate’; a powerful, mobilized primary industry opposition; and the urgency caused by contemporary political exigencies.

Given the context, it was argued, the online features of this consultation were pragmatically designed, managed transparently and inclusively, and did not prolong unnecessarily the deliberative process before presenting the legislation to Parliament. Additionally, the policy consultation clarified public debate and methodically handled submission feedback on key components of the package. The online links and pre-consultation materials were essential and educative. DCCEE’s pre-consultation role was to liaise, provide and receive advice, clarify and make information accessible and meaningful for citizens, explain international policy dimensions, give advice to households and businesses, and link to Treasury and other agencies for modeling, and to CSIRO and the Bureau of Meteorology for regular visualizations of climate trends.

Familiarizing citizens with complex information in order to help them make more considered submissions is the priority task of government agencies. It is not always successful, but it normalizes higher standards for deliberative processes. While possibly unremarkable in technically innovative terms, DCCEE's consultation processes tended towards the equalization of more and less powerful voices, and the supporting material was as accessible as possible, given the economic and technical specificity of the policy issues. Post-package consultation, its information-rich advocacy of effective solutions to climate change continues, as does its normalization of the concept of 'green citizenship.'

References

- Australian Livestock and Rural Transport Association (2011) *Submission to Clean Energy Legislative Package Consultation* [online] <http://www.climatechange.gov.au/government/submissions/closed-consultations/clean-energy-legislative-package/public-submissions.aspx>
- Australian Industry Greenhouse Network (2011) *Submission to Clean Energy Legislative Package Consultation* [online] <http://www.climatechange.gov.au/government/submissions/closed-consultations/clean-energy-legislative-package/public-submissions.aspx>
- Australian Policy Online (2011) *Clean Energy Bill 2011 Exposure Draft* [online] <http://apo.org.au/research/clean-energy-bill-2011-exposure-draft>
- Australian Trucking Association (2011) *Submission to Clean Energy Legislative Package Consultation* [online] <http://www.climatechange.gov.au/government/submissions/closed-consultations/clean-energy-legislative-package/public-submissions.aspx>
- Bureau of Meteorology, (2011) *Annual Climate Change Statement 2011*, Commonwealth of Australia [online] http://www.bom.gov.au/announcements/media_releases/climate/change/20120104.shtml
- Clean Energy Future* (2012), Commonwealth of Australia, [online] <http://www.cleanenergyfuture.gov.au/clean-energy-bills-receive-royal-assent/>
- Curry, Patrick (2011) 'Green Citizenship and Education' in *Ecological Ethics: An Introduction*. Polity: Cambridge pp. 159-83
- Department of Climate Change and Energy Efficiency. Commonwealth of Australia [online] <http://www.climatechange.gov.au/default.aspx>
- Doecke, S. (2011) *Submission to Clean Energy Bill Consultation*, 18 August [online] <http://www.climatechange.gov.au/government/submissions/closed-consultations/clean-energy-legislative-package/public-submissions.aspx>
- Early, S. (2011) "Email submission to Greg Combet" DCCEE. 28 July [online] <http://www.climatechange.gov.au/government/submissions/closed-consultations/clean-energy-legislative-package/public-submissions.aspx>
- Energy Rating Website (2012). [online] <http://www.energyrating.gov.au/>
- Garnaut, R. (2011) *Garnaut Climate Change Review* [online], <http://www.garnautreview.org.au/update-2011/garnaut-review-2011.html>
- Gordon, T (2011) *Submission to Clean Energy Legislative Package Consultation*, 3 August [online] <http://www.climatechange.gov.au/government/submissions/closed-consultations/clean-energy-legislative-package/public-submissions.aspx>
- Greening Australia (2011) Gondwana Link [online] <http://www.greeningaustralia.org.au/visionary-projects/gondwana-link>
- Green Plumbers: Creating Sustainable Communities. (2012) [online] <http://www.greenplumbers.com.au>
- Griffiths, M. (2009) "Edemocracy design: Citizen consultation on contentious issues" in Prosser A. and P. Parycek eds, *Proceedings of EDEM 2009*, Oesterreichische Computer Gesellschaft, pp 51-59.
- Hulme, Mike (2010) "The Year Climate Science was Redefined" *The Guardian* [online]. <http://www.guardian.co.uk/environment/2010/nov/15/year-climate-science-was-redefined>
- Joint Science Academies Statement: Climate Change Adaptation and the Transition to a Low Carbon Society (2006) [online] www.science.org.au/policy/climatechange-g8+5.pdf
- Kyoto: Framework Convention on Climate Change. [online] http://unfccc.int/kyoto_protocol/items/2830.php
- Leiserowitz, A. (2007) "Communicating the risks of global warming: American risk perceptions, affective images and interpretive communities," in S. Moser and L. Dilling, eds. *Creating a Climate for Change: Communicating climate change and facilitating social change*. Cambridge University Press.
- Living Greener*, Commonwealth of Australia [online] www.livinggreener.gov.au
- McCright, A. M and RE Dunlop (2003) "Defeating Kyoto: The Conservative Movement's Impact on US Climate Change Policy" *Social Problems*, 50:3, 348-378.
- Norman, B. (2010) "A Low Carbon and Resilient Urban Future" [online] Department of Climate Change and Energy Efficiency, Commonwealth of Australia <http://www.climatechange.gov.au/publications/local-govt/a-low-carbon-and-resilient-urban-future.aspx>
- Petherick, A. (2011). "Duty Down Under" [online] *Nature Climate Change* Vol 2 pp 20-21. http://www.nature.com/nclimate/journal/v2/n1/fig_tab/nclimate1339_F1.html
- Solar Cities, Catalyst for Change*. (October 2011). Background paper. Department of Climate Change and Energy Efficiency, Commonwealth of Australia.
- The Climate Institute (2011) 'Factsheet on Climate Change and Extreme Weather Events' [online] <http://www.climateinstitute.org.au/our-publications/reports/784-climate-change-a-extreme-weather-events>

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- The Treasury (2011) "Strong Growth, Low Pollution: Modelling a Carbon Price" [online] , Commonwealth of Australia www.treasury.gov.au/carbonpricemodelling/content/overview.as
- Wong, P. (2010) "Opening Address Climate Change Conference" [online]
<http://www.climatechange.gov.au/minister/previous/wong/2010/major-speeches/February/sp20100218.aspx>
- Xenophon, N. (2011) *Submission to Clean Energy Legislative Package* 6 September [online].
<http://www.climatechange.gov.au/government/submissions/closed-consultations/clean-energy-legislative-package/public-submissions.aspx>

Implementation of a Contact Centre – a Local eGovernment Initiative

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Abstract: A case study of the implementation of a contact centre (CC) in a Swedish municipality was described and discussed. The implementation was an example of a local eGovernment initiative. Seventeen employees at the municipality were interviewed. The initial implementation of the CC was done quickly, with a top-down approach. There were initial problems with negative attitudes towards the CC from the employees at the municipal departments. The new technology systems contributed to increased efficiency and to a more process-oriented organization. The CC was largely well-functioning, and many handling officers were relieved of work tasks related to the implementation of CC. There was a need for further competence development among the service handling officers at the CC. The number of incoming matters increased, related to the increased availability to citizens of municipal services.

Keywords: contact centre, local eGovernment, implementation

1. Introduction

The case study was made as part of the Innoveta research project (2008-2011) financed by the Swedish research council Vinnova (Bernhard 2009, 2010, 2011; Bernhard & Grundén 2010; Grundén 2010, 2011). The aim of the project was to support and evaluate the establishment of contact centres (CCs) and e-services within some Swedish municipalities.

The aim of this article is to describe and discuss a case study of the implementation of a contact centre (CC) in a Swedish municipality. Implementation of CCs in municipalities is an example of a local eGovernment initiative. There is a lack of empirical studies of implementation of contact centres in municipalities within the research field of eGovernment. This study contributes to an understanding especially of the social and organizational challenges when contact centres are implemented in municipalities. In a coming article all our evaluation studies of implementation of CCs will be compared and analysed, and then the variations of the implementation strategies related to the local culture in the different municipalities will be highlighted.

eGovernment is a rapidly growing phenomenon at the local, national, and international levels (Worral, 2011; Rabiaiah & Vandijck 2011). Implementation of eGovernment is often associated with increased citizen accessibility to public e-services, but it also means a fundamental organizational change in public organizations (Grönlund 2001). Organizational changes are often inspired by new public management (NPM) ideas and for example the increased focus on citizen's demands and the approach of considering citizens as customers (Wihlborg 2005; Bock Seegard 2009). A main challenge for the further implementation of eGovernment is the integration of front-end services with back-end processes. According to a study of more than twenty governments in different countries, Accenture (2007) found many governments at an important crossroads. The main focus for public service organisations has been on improvements in front-end services to citizens, neglecting the importance of also aligning back-end aspects.

Usage of the Internet and computers is high in Sweden and the country is ranked as one of the top countries according to international evaluation studies (United Nations 2010, Accenture 2007). The big state organizations are forerunners in this development, but eGovernment is also being successfully implemented in local governments. An "eGovernment Delegation" was established in 2009 to promote development and use of eGovernment in Sweden. Their main aim was to "have simple, open, accessible, effective and secure eGovernment" (Regeringskansliet 2008). The government of Sweden defines eGovernment as "organizational development in public administration, which takes advantage of ICT in combination with organizational changes and new competencies" (ibid.).

The 290 municipalities in Sweden make up 70% of the total public administration. They are governed by elected local officials and have a high degree of autonomy. The internal context of each

municipality can be very different due to different geographical locations, population, social structures and economic conditions. Services to citizens include, for example, building permits, environmental permits, matters related to social services and schools, healthcare, day-care and welfare. Swedish municipalities do not have a statutory obligation to set up offices or similar service locations for their inhabitants. However, it is mandated by Swedish law that all Swedish municipalities should provide individual service, for example, meeting visitors and answering telephone calls from citizens.

The implementation of CCs in Swedish municipalities is inspired by the concept of a call centre. A call centre is a place where you deal with phone calls completely dependent on the use of IT. The concept of a call centre is transformed when adapted to Swedish culture (Czarniawska & Sevón 1996), and the CC concept also indicates an extended function, not only focussing on phone calls, but also on other contiguous work tasks (Andersson, Bäck 2008). The development of CCs in the public sector is especially influenced by aspects such as increased service and availability from a citizen's perspective and internal efficiency. Some motives behind the implementation of CCs in municipalities generally were issues of accessibility to municipal services when citizens had inquiries to be answered or matters to be resolved. When CCs are implemented in municipalities they will have an intermediary function between citizens and the handling officers at the municipal departments. A main function of the CCs is to answer simple telephone questions from citizens when they call the municipality. When needed, employees at the CC also initiate matters that are transferred to handling officers at the back office using an information system for handling of matters. When a handling officer starts to handle a matter, the citizen making the request may be contacted by the handling officer if required.

The municipal website is a main electronic resource for information to citizens and organizations in the municipality. The municipal e-services are also published on the website. Usually the municipal e-services are communicated and supported by employees at the CC.

2. The case study

2.1 Research method

The research method was a case study of implementation of CC in a Swedish municipality, with the use of qualitative semi-structured interviews. Interviews were made with respondents with different professions and positions at different departments, in order to receive an overall qualitative understanding of the case studied. All interviews were made at the work place, and contributed to the understanding of the context, but no systematic participative observations or document studies were made.

The CC was launched in spring 2010 and the interviews were made during the late spring of 2010 and spring of 2011 with 17 managers, employees and trade union representatives at the CC and the administrative departments of the municipality. All interviews were made by both authors at the respondents' offices. The interviews lasted about an hour. All interviews were recorded and transcribed. The analysis of the interviews was made by content analysis.

2.2 The municipality

The studied municipality had a population of about 70,000 inhabitants and was rapidly expanding. The municipality is situated in the middle of Sweden, close to a big city. The municipality is organized in five operative departments. Most of these organizational units were led by boards or committees of political representatives. The departments and administrations carried out a wide range of operations such as child and youth care, education, social issues, culture and recreation, building and environment. The municipality was described as a "very typical Swedish municipality" by one respondent.

2.3 The implementation process

The decision of implementation of the CC had strong political support. A project leader for the implementation process was externally recruited. He had earlier experience from the implementation of a CC in a nearby municipality. There were great expectations that the external recruiting of the manager and the implementation of the CC would solve many of the background problems in the municipality. Some motives behind the implementation of CCs were problems with dropped phone

calls from citizens to the handling officers at the different departments. The implementation work was rapidly initiated. The manager was given broad scope to design and implement the new CC. He quickly started to build a full-scale CC which he described like:

“... In principle, from that I set foot here the first day until we were started, it took nearly a year and a half before everything was ready, thus it's clear it was fast, but I think, right or wrong, my thought was to blow, blow it now while people are on the track, and have something to show.”

The basis was a traditional telephone switchboard, and a small office offering personal information to citizens about municipal issues. There was also already an established organizational unit for citizen services at the department for building and environment that was moved to CC.

The number of employees at the CC was based on initial call volume. Some telephone operators at the telephone exchange unit would soon be retiring, and the remaining employees at that organizational unit were also moved to the CC. The remaining service handling officers were mainly internally recruited. A main reason for this recruitment strategy was the fact that the departments needed to financially contribute to the CC operation. About five employees from the departments were recruited to CC unwillingly. The work at the CC was more sedentary and they became more tied to the work compared with their earlier work situations at other departments. This recruitment contributed to negative attitudes from other employees at the departments towards the CC. Other customer service handling officers were voluntarily recruited from the departments, while a few were externally recruited.

The CC started in spring 2010 with about 25 employees. The employees were sitting in an open office arrangement. The activities of the CC were organized in different response groups. There was one operations manager for each response group. A response group for social services was established at the end of 2010. When the CC was implemented, a touch tone technique for phone calls to the municipality was introduced. When citizens call the CC, they now have to use the keypad in order to talk to the relevant response group. After the initial problems with the unwilling internal recruitment of customer service handling officers, the work seemed to be going smoothly at the CC. Some customer service handling officers mentioned, however, that the work could be stressful.

There were still problems however, with negative attitudes from the employees at the departments. About a year after the establishment of the CC, about 90% of the implementation work was to build support for the idea of the CC among the employees at the departments. One of the most difficult aspects of this anchoring process was the financial aspect of the CC, and to find ways for the authorities to change their budgets in a constructive way.

Each response group had contact persons at their department and held regular meetings together. The work at the CC was very flexible, according to the manager. Most employees and managers would be able to replace each other, when there was absence due to illness, for example. A smaller reception area for citizen visits was opened in the entrance hall of the building at the end of 2010.

An employee responsible for the coaching and training of the customer service representatives was recruited externally. The manager generated work descriptions and competence profiles for the customer service representatives, which were used as a basis for the competence development programs for them. How to communicate with and act towards citizens during the telephone calls was an important focus of the training. There were efforts to develop e-learning education for this training, using video and a learning management system. There was however a need for continuous competence possibilities of the customer service representatives, in order to counter the monotony and routine aspects of the job. This would be especially important for the highly educated social workers in the response group for social services. Some respondents questioned the fact that it was necessary to have highly educated social workers in the CC.

In late 2010 another employee was recruited to coordinate all external and internal contacts for the CC. In order to increase the understanding of the activities at the CC and affect the attitudes towards CC, the co-ordinator was invited to listen to incoming telephone calls from citizens.

An information database known as “Come Around” was implemented in late 2010 and replaced the earlier system in which citizens' questions and answers were documented in an Excel spread sheet.

When the customer service representative uses the Come Around system, the system starts looking for relevant information, as soon as a few syllables of the question are entered into the system.

All incoming calls were documented in an information system for handling of matters (Flexite), where the progress of handling matters could also be followed. In Flexite all matters were categorised, which enabled the production of statistics. The handling of matters by the handling officers at the departments was now initiated by the Flexite system, instead of by phone calls from citizens as before. Most administrators seemed to have been relieved of work tasks, due to the implementation of CC, and they could spend more time with the handling of citizens' matters when they were not disturbed by incoming calls from citizens. Some handling officers mentioned, however, that they missed the earlier spontaneous citizen contacts.

The municipality in the case study was one of the municipalities in Sweden with the highest number of e-services. Some of the e-services were much used by the citizens, for example the e-services for fault reports to the technical department. But some of the e-services were hardly used by the citizens, such as the application for building permits. Such an application was rarely made, and citizens seem to prefer personal contacts with the municipality when making such an application.

3. Discussion

3.1 The implementation strategy

The implementation strategy chosen is often a consequence of the prevailing organisational culture and decision-making processes in the organisation (Bergström 2002). The principles for recruiting of employees to the CC could be seen as part of the implementation strategy and is of importance for the success of the CC. The recruitment principles in the case study were related to the economic model chosen for the financial contribution from the departments to the CC. It is important to discuss both the economic model and the consequences of using the model, early in the implementation process, in order to prevent negative consequences affecting the process. An alternative strategy for the recruitment in the case study could have been to start to deal with redundancy problems in terms of the number of employees at the departments after the recruiting of employees to the CC was finished.

The principles for recruiting could affect not only the work of the CC, but also the attitudes and co-operation with the employees at the various departments. According to our earlier evaluation studies where employees were re-assigned to the CC, there were initial difficulties to establish a well-functioning organization. In one of the studied municipalities the manager of the CC had the freedom to "hand-pick" employees to the CC, which resulted in a very well-functioning operation from the very start of the CC (Grundén 2010). In this case study these two extreme recruiting strategies seem to have been combined. The recruitment of customer service representatives in the CC was both internal and external. Some were recruited unwillingly and others on a voluntary basis. The employees who were recruited against their wishes were initially very dissatisfied, and the attitudes of other employees at their previous departments were also affected negatively. Such negative reactions could take a long time to overcome and affect the whole implementation process.

There is a need for increased focus on back office and social aspects in the further implementation work at the municipality. Implementation of eGovernment has earlier been criticised for focusing too much on technical aspects (Grönlund 2001; Schedler and Summermatter 2003; Kifle and Low Kim Cheng 2009), thereby ignoring the importance of social aspects. According to a study by Accenture (2007), many governments face great challenges in order to integrate back-office aspects in eGovernment development. According to the study many governments have tended to underestimate the importance of attitudes and change in the work for employees, when eGovernment is implemented.

A top-down strategy was used for the initial implementation process, and a very rapid implementation of the CC was expected by management. But the negative attitudes towards implementation seemed to have become more and more of a problem for the implementation process. The problems of lack of anchoring and negative attitudes could be related to the top-down strategy. Participation in the implementation could lead to increased understanding and motivation by the participants. The implementation strategy could affect the employees' attitudes towards the implementation process, according to classical theories and research regarding change work in organizations. The top-down

strategy could be relevant in order to “make the change happen”, but a lack of participation could contribute to a sense that “the implementation has nothing to do with my work” and affect the willingness to contribute to the change. Participation in implementation work could instead increase motivation and reduce resistance towards change (Angelöw 1991). Participatory design has a long tradition (Kensing & Blomberg 1998), but participation by all users is difficult however to put into practice in large organisations. Representative participation could be used in such organisations when many users are affected by a new system or changes to systems (Ranerup 1996). The organisation and forms of participation and change work could probably be developed and extended with relevant group discussions and competence development in order to include all users in new ways. Participation in the implementation process could be a way to learn and develop competence for the users. If the implementation work also focuses on organisational and competence issues, then the mutual understanding of the different responsibility fields and changed work roles increase during the analysis work. Such an analysis of the work process could be a relevant basis for learning in the implementation process (Svensson & Åberg 2001).

Development of e-services is part of the implementation of eGovernment in local government. There were some problems with under-utilized e-services in the case study. There is a global problem with developed public e-services that are not used very much, according to a study by OECD (2009). A thorough problem analysis and participation of user groups in the development and design process of public e-services could prevent such problems.

The information system for handling of citizens' matters in the case study contributed to the efficiency of the handling process compared with earlier procedures. The transfer of the initiated matters from the CC to different response groups at the departments contributes to a process organization of the work with more co-operation among the handling officers compared with before, when a citizen's direct contact with a handling officer initiated a matter. The registration of the contacts with the citizens in Flexite by the customer service representatives contributes to the production of statistics; a function that could be further developed using business intelligence tools. The information database Come Around also contributed to the efficiency of the customer service representatives' work in giving adequate responses to citizens' questions.

The implementation of CC seems to have contributed to increased efficiency from the management perspective. Management also has more control over the handling process of citizens' matters due to information produced by the information systems, for example. But implementation of CC that facilitates the citizens' contacts with the municipality also contributed to increasing the number of incoming matters, which could require more resources to handle. This consequence seemed not to have been foreseen by the project management.

3.2 The changed work situations for the service handling officers'

Several respondents in the case study mentioned the need for continuous competence development. There are documented common risks with work in call centers as being monotonous, stressful and lacking variation (Tengblad et al. 2002). A lot of attention is generally given to the work of the customer service representatives when the CC is launched (during “the honeymoon”), but it is a challenge to have continuous learning possibilities. The initial strong focus on the work of the municipal guides could contribute to the so-called Hawthorne effect (Mayo 1949), and increase the initial motivation of the work. The need for competence development seemed to be most important for the social workers in the response group for social services at the CC.

In our evaluation studies of CCs in other municipalities we have found different competence strategies for the employees in CCs (Bernhard & Grundén 2010). One strategy focused on the formal aspects of information and knowledge. Formal checklists are developed and used by the employees in the CC for most telephone contacts with the citizens. An opposite strategy is the informal strategy, where almost no checklists are used, and the employees search for the answers during the phone call, for example by visiting different websites. The knowledge is then more “in the head” of the employees than “on paper”. In this municipality there seems to be a striving for a balance between a formalized and informal strategy. The customer service representatives appreciated the new information database (Come Around), but were not forced to use it, and they could also use their informal knowledge.

3.3 The changed work situations for the handling officers at the departments

Many handling officers at the departments seemed to react with initial anxiety and fear of the effects on their jobs, when some employees were moved to the CC against their will. Such negative attitudes towards the CC greatly affected the implementation process, and the project management had to make serious efforts to change those attitudes. Such worries could probably have been reduced at an earlier stage, and other recruiting strategies could have been chosen, if management had been more aware at an early stage of the social consequences of the recruitment strategy. An alternative strategy could have been to recruit most of the personnel to the CC before discussions about the need to reduce the number of employees at the departments took place. Usually there are many employees retiring in the coming years in public organisations, and a complementary strategy could be to not refill their positions, for example with changes in the current work division to enrich work situations with new work tasks or work rotations for the handling officers affected. According to our results there will probably not be any further redundancy of employees, as long as the population of the municipality increases, which was the case in the studied municipality. The increased number of questions and matters due to the establishment of the CC seems to be handled within the existing number of employees, due to increased internal efficiency.

Explicit personnel strategies seem to be important at an early stage in the implementation process, in order to reduce anxiety among the employees regarding the risks of losing their jobs. It is not unusual however, that management does not emphasize such aspects, in order to eliminate potential conflict in the implementation work. There is a tendency for “problematic silences” on such issues in implementation of eGovernment, according to Seyfyrin and Mortberg (2009). Such a strategy could have the reverse effect. Important aspects that are not clearly formulated in the implementation work could contribute to uncertainty and lack of motivation. If all expected consequences of the implementation were more clearly formulated and discussed in a dialogue with the employees concerned, the sense of uncertainty could be reduced, which would positively affect motivation.

4. Conclusions

The initial implementation of the CC was made rapidly with a top-down approach. However, the idea of the CC was not sufficiently anchored among the employees at the authority. Some handling officers from the departments were recruited to the CC against their will, due to cost-cutting needs as the departments needed to contribute to the financing of the CC. Many employees were afraid that their work would be transferred to the CC and reacted negatively, which was a big problem for the initial implementation process. Alternatives to the top-down approach could have been a more participatory approach in order to increase the understanding of the CC and affect their attitudes. An alternative strategy for the recruitment could have been to start to handle redundancy problems after the recruiting of employees to the CC was finished. The strategies were revised, however, when a special response group for social services was established. More efforts were made to build support and anchor the idea of the CC, and no employees were recruited against their will.

Some e-services were very popular, but some were hardly used by citizens. Participation of user groups in the development and design process of public e-services could prevent such problems. The information system for handling of citizens' matters contributed to the efficiency of the handling process and to a process-oriented organization. The registration of the contacts with the citizens in the system contributed to production of statistics, a function that could be further developed using business intelligence tools. The information database at the CC also contributed to the efficiency of the customer service representatives' work. The implementation of CC contributed to an increase in incoming matters, a consequence that was not foreseen by project management.

The work at the CC was largely well-functioning and most customer service representatives seemed to enjoy their work, although the work sometimes could be stressful. There were competence development efforts by management at the CC for their employees. There will be further need for continuous competence development in the long run as well. Many handling officers reacted initially with fear of losing their job or that their work tasks would be transferred to the CC. Explicit personnel strategies seem to be important at an early stage in the implementation process, in order to reduce such anxieties among employees. Most handling officers at the departments were relieved of work tasks related to the implementation of CC and they could work more efficiently with the handling of matters.

References

- Accenture (2007) "Leadership in Customer Service: Delivering the Promise". [Electronic source]: www.accenture.com [accessed on 2010-02-01].
- Angelöw, B. (1991) *Det goda förändringsarbetet. Om individ och organisation i förändring*. Studentlitteratur, Lund.
- Andersson, Bäck, M. (2008) *Conceptions, conflicts and contradictions at the introduction of a Swedish Health Care Centre*. Academic thesis. University of Gothenburg, Department of Work Sciences.
- Bergström, T. (2002) *Organisationskultur och kommunal förnyelse. Förändring i gamla hjulspår?* Liber AB, Malmö.
- Bernhard, I. (2009) "Evaluation of Customer Centre and e-services in a Swedish municipality with focus on the citizens' perspective" in Remenyi, Dan (ed.) *Proceedings of the 3rd European Conference on Information Management and Evaluation*, pp 34-41, Gothenburg, Sweden, 17-18 September.
- Bernhard, I. (2010) "Establishment of Customer Centres in the Public Sector in Sweden – the Citizens' Views" in O'Donnell, D. (ed.) *Proceedings of the 10th European Conference eGovernment*. National Centre for Taxation Studies, University of Limerick, Ireland, 17-18 June. pp. 63-70, Intellectual Capital Research, Limerick, Ireland, Academic Publishing International.
- Bernhard, I (2011) "Local EGovernment in Sweden – establishment of municipal contact centers with focus on the citizens and the public administrators". *ERSA-Proceedings of the 51st European Congress of the Regional Science Association*, Barcelona, August, 30-September 3.
- Bernhard, I. & Grundén, K. (2010) "Kompetensstrategier vid införande av kundcenter i kommuner". In Lagrosen, S. Nehls, E. & Snis, U. *Lärande i och för det nya arbetslivet*. Lund. Studentlitteratur.
- Bock Seegard, S. (2009) *Veje til lokalt e-demokrati – organisering, mål, virkmidler og resurser*. Oslo: Oslo University Press.
- Czarniawska, B. & Sevón, G. (1996) *Translating Organizational Change*. Berlin: de Gruyter
- Grundén, K. (2010) "Evaluation of contact centre implementation in a Swedish municipality with focus on social aspects". O'Donnell, D. (ed.) *Proceedings of the 10th European Conference on eGovernment*, National Centre for Taxation Studies, University of Limerick, Ireland, 17-18 June, Intellectual Capital Research, Limerick, Ireland: Academic Publishing International.
- Grundén, K. (2011) "Implementation of contact centre in a Swedish municipality". In Klun, M., Mitja, D. & Jukic, T. *Proceedings of the 11th European Conference on eGovernment (ECEG 2011)*, Faculty of Administration, University of Ljubljana, Ljubljana, Slovenia, 16-17 June.
- Grönlund, Å. (2001) "En introduktion till electronic government". In Grönlund, Å. and Ranerup, A. (eds.) *Elektronisk förvaltning, elektronisk demokrati. Visioner, verklighet, vidareutveckling*. Studentlitteratur, Lund.
- Kensing, F. and Blomberg, J. (1998) "Participatory Design: Issues and Concerns". *Computer Supported Cooperative Work*, Vol. 7, No. 3-4, pp 167-185.
- Kifle, H., and Low Kim Cheng, P. (2009) "eGovernment Implementation and Leadership – the Brunei Case Study". *Electronic Journal of eGovernment (EJEG)*, Vol. 7, Issue 3, pp. 271 – 282.
- Mayo, E. (1949) *Hawthorne and the Western Electric Company, The Social Problems of an Industrial Civilisation*, Routledge.
- OECD (2009) *Rethinking eGovernment Services. User-centred approaches*. OECD eGovernment Studies
- Rabiaiah, A. & Vandijk, E. (2011) "A Strategic Framework of eGovernment: Generic and Best Practice". In Worrall, L (ed.) *Leading Issues in eGovernment Research*, Reading: Academic Publishing Internationals.
- Ranerup, A. (1996) *Användarmedverkan med representanter*. Ak. doktorsavhandling. Göteborgs Universitet. Gothenburg studies in informatics, 1400-741X;9.
- Regeringskansliet (2008) *Handlingsplan för eFörvaltning. Nya grunder för IT-baserad verksamhetsutveckling*.: www.regeringen.se. Accessed on 2010-11-23
- Schedler, K. and Summermatter, L. (2003) "eGovernment: What Countries Do and Why: A European Perspective". In. Curtin, G.C., Sommer, M.H. and Vis.-Sommer, V. *The World of eGovernment*, The Haworth Political Press.
- Sefyrin, J. and Mortberg, C. (2009) "We do not Talk about this: Problematic silences in eGovernment". In *Electronic Journal of eGovernment (EJEG)*, Vol. 7, Issue 3, pp. 259 – 270.
- Svensson, L. and Åberg, C. (2001) *E-learning och arbetsplatslärande*. Bilda Förlag, Stockholm.
- Tengblad, P., Wiberg, A., Herrman, L. and Backström, M. (2002) "Hållbart arbete i informationssamhället. Call centre i utveckling". In *Call centre i utveckling – långsiktigt hållbart arbete med kunder på distans*. Vinnova report VR 2002:7.
- United Nations (2010) "United Nations EGovernment Survey 2010. Leveraging EGovernment at a Time of Financial and Economic Crisis", United Nations, New York
http://www.unpan.org/egovkb/global_reports/08report.htm accessed on 2011-10-29
- Wihlborg, E. (2005) *Offentliga e-tjänster i medborgarens tjänst*. Stockholm: 24-timmarsdelegationen.
- Worrall, L. (2011) "Introduction to Leading Issues in eGovernment Research eGovernment – Where is it taking us and our Governments? In Worrall, L. (ed.) *Leading Issues in eGovernment Research*, Reading, UK: Academic Publishing International Ltd.

The Critical Success Factors of E-voting Implementation in Indonesian Local Elections: The Case of Jembrana Regency Election

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Abstract: Electronic voting (e-voting) brings the idea of modernising elections through electronic systems and provides many advantages such as efficiency, presenting results more quickly, and reducing cost. In early 21st century some countries such as India, Brazil, and Estonia have conducted research and implemented e-voting system. Meanwhile, the possibility of using e-voting for Pemilihan Umum (Indonesian General Election) is still under debate. Until 2010 the Indonesian Ministry of Home Affairs and Komisi Pemilihan Umum (The General Election Commission) refused the e-voting system which was offered by Badan Pengkajian dan Pengembangan Teknologi/BPPT (The Indonesian Agency for The Assessment and Application of Technology). Surprisingly, since 2009 Jembrana Regency, Bali Province, Indonesia has developed an e-voting system from a cafeteria order system. This system has been implemented for hamlets and villages' chief elections. The e-voting project which was held by The Local Government of Jembrana Regency and supported by BPPT is recorded as the first e-voting-based election in Indonesia. It has now become the approved-procedure of hamlet and villages' chief election. Technology-Indonesia News Portal reported that the *e-voting* project has been successful because people in Jembrana feel satisfied with its results and efficiency. The Public Relations Chief of Jembrana reported that e-voting saved 60% of the election budget, compared to the paper-based system. Another achievement reported by Bali Post was that no protest or conflict occurred during e-voting-based elections. This demonstrates that well-developed e-voting systems can improve the democratic process, compared to Indonesian paper-based elections that sometimes cause conflicts and manipulated results. Many people are surprised that such a small regency could be so innovative. This paper focuses on how the Jembrana Regency implemented e-voting and identifies its critical success factors. The identification process was conducted by interviewing project teams and researching literature. An understanding of critical success factors of this e-voting project can provide useful information for the government and also help other regents/districts/provinces to build e-voting implementation strategies. Hopefully in the future, e-voting will be accepted as the official election procedure and bring high quality elections to the country.

Keywords: e-voting, electronic voting, critical success factor, CSF, Jembrana, Indonesia, election

1. Introduction

In the digital era, technology influences how people uphold democracy included in elections. The paper-ballot which is usually used as media in conventional elections, could be replaced with electronic stuff such as computers. The new system is called electronic voting or e-voting. The Indonesian Ministry of Research and Technology defines e-voting as *"a system that uses electronic tools and process digital information to provide paper-ballot for elections, count paper-ballots, present election results, keep and provide audit trails"* (Ristek 2010). Based on Efraim's e-Government classification, e-voting could be categorized as G2C (Government to Citizen) electronic government service because it facilitates interaction between citizens and their governments (Efraim 2009). The goal of e-voting is generally to improve accessibility, easiness, accuracy, and security of election for better democratic process (Alvarez 2005).

The Council of Europe mentioned that some motives for e-voting implementation relate to the easy and accessibility of election participation. Other motives are about benefits of cost reduction and an efficient administration process (Remmert 2004). Despite those benefits, some stakeholders feel discouraged to apply e-voting. E-voting is deemed vulnerable from fault, fraud, and other types of cyber crime (Obaod 2011). The discouragement of e-voting also occurs because it brings high potential risks in politics. A failed voting causes serious politics problems. For those reasons, e-voting has to be implemented successfully only if followed by good strategy and practices.

The strategies of e-voting implementation need to consider critical success factors (CSFs) as essential components. CSFs are certain strategic factors which have to be well-achieved to get the success of goal and targets. Pinto defined CSFs as *"some factors which, addressed, significantly improve project implementation changes"* (Pinto 1987). The CSFs approach helps election management to maintain and focus on those significant factors in order to keep project on the right

path. In this paper, we look at previous e-voting implementation in Jembrana Regency and thus identified its critical success factors. The CSFs will give essential guideline for implementation strategies of other e-voting projects in the future especially in Indonesian local elections.

2. Research methodology

This research employs the case study method with a qualitative descriptive approach to explore an issue, describe a process, or explain a phenomenon. According to Yin, case study is *“an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used”* (Yin 1994). In this research, Jembrana's e-voting project is the contemporary phenomenon that was selected as object study. First, the process of e-voting project was evaluated from initiate to deployment phase. Data required for the evaluation process was derived from project documentations, literature, and experts' opinion in mass media. In addition, some CSFs identified from previous e-voting projects in other countries were also reviewed as comparison. Second, researchers created a question list based on data from the evaluation process, especially from the experts' opinion and CSFs comparison. The question list was designed to represent question research, “What factors are significantly contribute to e-voting implementation in Jembrana?”. Third, the members of e-voting project team got involved in interview session to answer the question list. The results of the interview section were analyzed in order to define the first draft of CSFs. The last step is asking confirmation of interviewees whether they agree with the CSFs draft or not. The CSFs draft which confirmed by all interviewees were considered as the final CSFs of e-voting implementation in Jembrana.

3. Backgrounds and case selection

Indonesia is one of the world's largest democratic nations where an election mechanism is an important procedure to vote leaders and representatives of more than 240-millions citizens. Every five years the Indonesian government holds presidential and legislative elections. There are also many un-simultaneously regional elections to choose governors, mayors, regents of 33 provinces every year. There is Komisi Pemilihan Umum/KPU (The General Election Commission), the national agency who is responsible to handle all national-wide or regional elections. Meanwhile, the responsibility of holding elections in village or lower level is not KPU's, but that is the autonomy of local governments.

Until 2010, all elections that were held by KPU had been paper-based. Somehow some problems appeared on those elections and caused rejections to election results, even triggered violent and serious conflicts. Azhari mentioned some common problems in Indonesian paper-based elections are errors of count process, voters' sign errors in paper ballot, long collecting process of paper-ballots, time-consuming tabulation process, and lack of secrecy of voter privacy (Azhari 2005). Therefore, the government wants to improve election quality by e-voting like experts' suggestions. The government plans to use e-voting in 2014 presidential election. The Indonesian parliament is still adjusting election law to e-voting as new system. KPU has new challenging duty to prepare and develop the election system, helped by BPPT and The Ministry of Research and Technology.

This research chooses Jembrana as a case study because the regency is the only local government where e-voting has already implemented. Jembrana has experienced how e-voting was used and accepted by its citizens since 2009. Although The Ministry of Home Affairs has ever rejected the use of e-voting in Jembrana Regent Election, e-voting development has been continuing. Jembrana's e-voting system has already passed the audit and verification process of BPPT(The Indonesian Agency for The Assessment and Application of Technology). and Mahkamah Konstitusi (The Constitutional Court of The Republic of Indonesia). In other words, the system is legal to be implemented as long as it fulfills legal election requirements. In 2009 Jembrana also received the E-government Award from Warta Ekonomi Magazines due to its achievements in information system development. The regency is supposed to be the role model of e-voting implementation in Indonesia.

4. E-voting project in Jembrana

4.1 Goal of e-voting

Professor I Gede Winasa, The Regent of Jembrana period 2000-2010, initiated e-voting implementation because of dissatisfaction with the electoral system in the past causing many riots

and problems (Jawa Post 2010). The regent found an opportunity to develop e-voting from Jembrana Smart School (JSS), an integrated-academic system which has been implemented in several schools in Jembrana. He gave instruction to Dinas Perhubungan, Komunikasi dan Informasi/Dinas Hubkominfo (Department of Transportation, Communication, and Information) to execute his idea. The e-voting system would be tested and implemented for Pilkadus (hamlet and village chief election) as the lowest level of election in the regency. Meanwhile, The Law Division of Jembrana issued a local regulation about e-voting for Pilkadus (hamlet and village chief election), named Perda No.1/2009 (Hartami 2011). The regulation mentions that the use of e-voting in the election process is aimed to provide elections with good quality of independence, secrecy, honesty, fairness, and democratic as stated in Indonesian Constitution. Therefore, e-voting is allowed to be implemented in Jembrana to achieve this goal.

4.2 Planning

Dinas Hubkominfo built a team which was allocated to develop e-voting. The project team was helped by experts of BPPT as system tester and auditor. Besides preparing the system technically, the project also needed contribution and cooperation between various departments in Jembrana. Table 1 explained job descriptions of each departments and offices that get involved in e-voting-based election.

Table 1: The job divisions of Jembrana village chief election (Pemkab Jembrana 2010)

Department/Office/Institution	Job Description
Kantor Pemberdayaan Masyarakat Desa (The Office of Rural Community Empowering)	Form committee of hamlet/village chief election Select candidates of hamlet/village chief Set e-voting schedule and place Send request to Department of Transportation, Communications, and Information to provide e-voting system Monitor election process Authorize election results
Panitia Pilkadus (The Committee of Village Chief Election)	Set list of eligible citizens who can participate in election and then propose the list to Department of Civil Population, Labor, and Transmigration Conduct election simulation on the village (one day before election day) Guarantee security during election day Organize election process Present election results
Department of Civil Population, Labor, and Transmigration	Validate list of eligible citizens Create and process request of identity cards for citizens Repair damaged-identity cards
Dinas Hubkominfo (Department of Transportation, Communications, and Information)	Provide e-voting system Create Standard Operational Procedure (SOP) of election Introduce e-voting system to citizens through training and election simulation
General Secretariat	Serve administration needs for e-voting.

4.3 Design and development

In early 2009, the project team modified the Jembrana Smart Scholl (JSS) system to be a prototype of the e-voting system. The JSS system has a food ordering feature which formerly was used in schools' cafeterias. Students who are holding student card can use the feature. Thus, the e-voting project team modified the JSS system by replacing menu of meals with options of hamlet/village chief candidates. For the voter identification and verification process, they used e-KTP replacing the student card in former JSS system. E-KTP is an identity card of Indonesian citizen which contains unique number for each citizen (Single Identity Number). In this modified system, each voter was limited to choose only one candidate.

The first generation of the Jembrana e-voting system was a polling station based-system and not connected to the internet yet to avoid cyber crime. Futhermore, the e-voting system should meet high security standard to avoid reducion of election principals. Secure procedures of e-voting were needed essentially to guarantee privacy and secrecy of voters. Therefore, a sophisticated algorithm was

added into e-voting system in order to randomize and hide ballots anonymously. The system was also designed as friendly as possible so that it would be used by citizens easily. There were three kinds of system configurations adjusted to numbers of voters (for less than 800 voters, between 801-1200 voters, and more than 1200 voters).

4.4 Implementation and results

The implementation of e-voting for hamlet and village chief elections was regulated through standard operational procedures (SOP) and acceptable election mechanism. Similar to Indonesian paper-based election, citizens have to visit polling station of election, verify their eligibility, then choose on a ballot. The difference lies on the verification process and the way of ballot choosing. For verification, people are used to verifying their eligibility in elections by showing their KTP (national ID Card) to election committee and then dipping their finger into ink (as proof that each voter only use their right once). However, in many cases people could use fake KTP and ink erasers for manipulation purposes. Meanwhile, verification of e-voting-based elections uses e-KTP which is able to identify the data and eligibility of each card owner accurately. People hole candidate's photograph by nail or checklist by pen in paper-based election, whereas in e-voting they just need to touch their candidate's picture on the monitor screen.

On the April 14th 2009, Pasatan Village held trial of Jembrana e-voting system. One day before, the committee of election conducted socialization and vote simulation in the village to educate citizen on the voting mechanism. It was recorded by Museum Rekor Indonesia (The Museum of Indonesian Records) as the first e-voting in Indonesia (Yasa 2009). Two weeks later Wali Village used the system to vote for its new village chief. The election in Wali attracted high enthusiasm from citizens and was witnessed by The Regent of Jembrana and The Chief of BPPT. On September following by other hamlets, Lemodang and Mekarsari. Table 3 below is the results of fourth first e-voting-based elections in Jembrana. There are data about number of voters, turnout, and time need to vote.

Table 2: The result of fourth first e-voting-based election in Jembrana (Winasa, 2010)

Village/Hamlet	Date	Number of Voters	Turnout (%)	Average Speed to Vote (second/person)
Pasatan (trial)	April 14 th 2009	355	95.8%	25.38
Wali	May 3 rd 2009	814	85.3%	13.27
Lemodang	September 23 rd 2009	499	88.2%	36.07
Mekarsari	September 23 rd 2009	629	88.6%	28.26

In each of those election, all candidates and committee approved the e-voting results by signing BAP (the report of election process). The results were declared stated valid and the election was acknowledged to be a success. Until May 2011, the system has been used for 88 times in hamlet/village chief elections and 3 times in three elections of chief of student association (Hartami 2011). The Chief of Dinas Hubkominfo said that there had been no complaints about the e-voting technology and the results were accepted by all candidates for hamlet/village chief (Hartami 2011). The Regency Jembrana reported that a citizen only needs 32 second on average to vote (Winasa 2010). The e-voting system also saved 15-billions Rupiah or around 60% of election budget (Karni 2010).

4.5 Further development

Nowadays e-voting project team of Jembrana has produced the third generation of e-voting system. Moreover, some features were added based on BPPT's audit and suggestions (Hartami 2011). Based on those successful trial and initial e-voting experiences, The Local Government of Jembrana proposed adjustment of election law in order to legally receive e-voting as new election mechanism. The proposal was welcomed and approved by Mahkamah Konstitusi RI (The Constitutional Court of The Republic of Indonesia) with restriction that e-voting implementation has to follow and fulfil Indonesian election principles. In 2010, the e-voting team prepared and developed 22 voting machines for The Jembrana Regent Election. Unfortunately, the plan could not be carried out because KPU, which was responsible to hold the election, was not ready to use e-voting at that time. However, e-voting in Jembrana encouraged its implementation at the national level.

5. CSFs identification and discussion

After understanding how the e-voting project in Jembrana was run out, we collected required data for CSFs identification process. As mentioned in research methodology sub-bab, the process was held through interviewing e-voting project team members and a question list was needed for interview guideline. The question list consists of the CSFs comparison of previous e-voting project, which is shown by Table 3 and given code for each factors.

Table 3: The comparison of CSFs of previous e-voting implementation (Chevallier 2006) (Hall 2004) (Prosser 2005)

Researcher	E-voting	CSFs	Code
Chevallier	Local election in Geneva (Swiss)	Politics were implicated at the highest level	A1
		The approach went step by step	A2
		Teams were multidisciplinary	A3
Hall	Local election in Georgia, USA	A clear vision and leadership at the state level	B1
		Strong voter and election worker education programs	B2
		Effective state regulation for how to implement the system	B3
		Creating a strong support structure to ensure local governments can	B4
		implement these systems into the future	B5
Prosser	Austria	Funding to support these activities	C1
		The digital gap	C2
		Trust and confidentiality	C3
		The political interest	C3

More data from some articles in the mass media which discussed the success story of e-voting implementation in Jembrana was also added to the question list. Those articles were written by some journalists and mentioned some factors that could be considered as potential CSFs. Table 4 bellow is the summary of the articles.

Table 4: The summary of potential CSFs from articles review (Ikawati 2011) (Yasa 2009) (Widodo 2010)

Articles	Author	Mass Media	Factors	Code
"Dari Bali dengan E-voting" (From Bali with E-voting)	Yuni Ikawati	Kompas.com (Edition March 5th 2010)	E-KTP which enables e-voting implementation	D1
"Pilkadus Touch Screen Raih MURI" (The Hamlet/Village Chief Election with Touch-Screen Achieved MURI/The Museum of Indonesian Record)	Gede Yasa	Jembranakab.go.id (Edition May 3 2010)	Innovation and commitment of leader	E1
"E-voting, Belajar dari Jembrana" (E-voting, Lesson Learnt from Jembrana)	Yohaness Widodo	Kompasiana (Edition May 3 2011)	Regulation and legal aspect of e-voting implementation	F1
			Population Information System and e-KTP as Single Identity Number (SIN)	F2

By combining factors from Table 3 and Table 4, the question list was arranged and shown in Table 5. There were actually 15 factors which were symbolized in 15 codes, from A1 to F1. We compressed the factors into twelve categories because some factors are redundant to others.

Table 5 The question list

Code	Factors	Categories
A1	Politics were implicated at the highest level	Political support
A2	The approach went step by step	Project approach
A3	Teams were multidisciplinary	Composition of project team
B1, E1	A clear vision and leadership at the state level; Innovation and commitment of leader	Role of leadership
B2	Strong voter and election worker education programs	Training or education

Code	Factors	program Categories
B3, F1	Effective state regulation for how to implement the system; Regulation and legal aspect of e-voting implementation	Regulation
B4	Creating a strong support structure to ensure local governments can implement these systems into the future	Government support
B5	Funding to support these activities	Funding or budget
C1	The digital gap	User acceptance
C2	Trust and confidentiality	Trust and security
C3	The political interest	Political support
D1, F2	E-KTP which enables e-voting implementation; Population Information System and e-KTP as Single Identity Number (SIN)	e-KTP and SIAK
G1	E-voting system	E-voting system
G2	Human resources for system development	Human resources

On May 19th 2011, the question list above was used to conducted interviews with five members of the e-voting project team. In chronological order, the interviewees were Mr. Harris Fadhilah (team leader of e-voting project), Mr. Haikal (member of e-voting project), Mr. I Putu Agus Budi Aryana (The Chief of Dinas Hubkominfo of Jembrana, Period 2010), Mr. Okariawan (member of e-voting project), and Mr. I Putu Agus Swastika (The Chief of Dinas Hubkominfo, Period 2009). Afterwards, the interview results were mapped into the question list by giving checklists on each factors that were considered by interviews as the e-voting CSFs.

Table 7 presents the answers of each interviewee, referred to as the first draft of CSFs. In the table, the interviewees were consecutively coded in number 1, 2, 3, 4, and 5. There were two new factors (G1 and G2) that appeared even though they are not mentioned in question list. That happened because we delivered open-ended questions and the question list only had function as interview guidelines.

Table 6: The first draft of CSFs

Code	Factors	Categories	Interviewees' Answer				
			1	2	3	4	5
A1	Politics were implicated at the highest level	Political support					
A2	The approach went step by step	Project approach					
A3	Teams were multidisciplinary	Composition of project team					
B1, E1	A clear vision and leadership at the state level; Innovation and commitment of leader	Role of leadership	V	V	V	V	V
B2	Strong voter and election worker education programs	Training or education program		V		V	V
B3, F1	Effective state regulation for how to implement the system; Regulation and legal aspect of e-voting implementation	Regulation				V	V
B4	Creating a strong support structure to ensure local governments can implement these systems into the future	Government support					
B5	Funding to support these activities	Funding or budget					
C1	The digital gap	User acceptance		V		V	V
C2	Trust and confidentiality	Trust and security					
C3	The political interest	Political support					
D1, F2	E-KTP which enables e-voting implementation; Population Information System and e-KTP as Single Identity Number (SIN)	e-KTP and SIAK	V	V	V	V	V
G1	E-voting system	E-voting system	V				
G2	Human resources for system development	Human resources			V	V	

In the Table 7 above, there are seventh checklisted-factors which are recognized as the first draft of CSFs of e-voting implementation. Moreover, factor B2 (training or education program) and factor C1 (user acceptance) were considered to have tight corelation (Hartami, 2010). In Jembrana case, the people accepted e-voting using for Pilkadus because there is effective communication between citizens, candidates, election committee, and Dinas Pemberdayaan Masyarakat Desa (The Office of

Rural Community Empowering). The communication channel through the training and socialization program about e-voting will be provided by The Local Government of Jembrana before election day. As reported by Bali Post in 2010, even the lose candidates of Pilkadus accepted e-voting result. By considering the corelation, the both factors (B2 and C1) could be joined as one factor, "well-maintained user acceptance through training and education program". Therefore, the first draft of CSFs could be compressed into six factors and then confirmed and validated by interviewees.

The result of the validation process eliminated factor G1 (e-voting system) from CSFs because interviews didn't validate the factor. They thought that how e-voting system would be developed depends on human resource factors. Factor G2 (human resources) was considered to give significant contribution, instead of technological factors. Finally, there are five factors which were concluded as the final CSFs of e-voting implementation in Jembrana, as stated in Table 8.

Table 7: The five final CSFs of e-voting implementation in Jembrana

Code	Factors	Agreed
B1, E1	The role of commitment, innovation, and leadership of regent/local leaders	✓
D1, F2	The development of e-KTP and SIAK which provide Single Identity Number (SIN) for citizens	✓
B3, F1	Law and legal aspect to regulate e-voting	✓
B2	Well-maintained user acceptance through training and education program	✓
C1, G2	Availability of adequate human resources who run e-voting system development	✓

According to interview results, the justification of each final CSF was given in this explanation:

1. The role of commitment, innovation, and leadership of local leaders.

The success of the e-voting project would have not been achieved if Professor I Gede Winasa, The Regent of Jembrana, had not given the command to develop it. All the interviewees mentioned I Gede Winasa had played an important role in the e-voting implementation. In addition, he brought the idea to apply Single Identity Number (SIN) concept into KTP (Indonesian ID Card) and modify the JSS system to become the e-voting system. Through his instruction and related regulation, the mayor proved his support for the e-voting initiative. The conclusion is that the leader's innovation and support are needed in order to carry out e-voting implementation successfully. As usual in rural areas, the local government board follows and executes their leader's instructions; as they are capable in leadership and commitment.

2. The development of e-KTP and SIAK which provide Single Identity Number (SIN) for citizens.

The development of various e-government services in Jembrana Regency opened opportunities to implement e-voting, especially Single Identity Number (SIN). The SIN concept was applied in KTP (Indonesian Card) and then it called e-KTP. The card creates an identity for each citizen and can be used in e-voting system to verify whether the citizen is included in eligible voters list or not. It is also integrated with citizenship population data in the Sistem Informasi Administrasi Kependudukan/SIAK (Population Administration Information System), so that every citizen has only one card. In Jembrana, e-KTP was already developed before 2009 for all citizens and it is connected to many public services such as health insurance and tax payment. Meanwhile, other regions are still in progress of e-KTP implementation even the capital, the Jakarta Province, has only begun e-KTP program in 2012. The Indonesian government has a target to carry-out e-KTP implementation in the whole country before the use of e-voting in the 2014 presidential election.

3. Law and legal aspect to regulate e-voting.

The Government of Jembrana has issued The Local Regulation of Jembrana No.1 of 2009 about Pilkadus (Hamlet and Village Chief Election). Therefore, e-voting implementation of Pilkadus which is organized by the election committee has legal protection. Moreover, policy and standard operational procedure of e-voting were established by Dinas Hubkominformasi and The Department of Law. Those all regulation, policy, and procedure for e-voting-based Pilkadus had been maintained and adjusted successfully to the new system. In comparison, e-voting implementation of the 2010 Major Election

was cancelled due to lack of legal aspect. Komisi Pemilihan Umum (The General Commission Election) was not ready to adopt the election since the Indonesian law about the commission has not yet changed and adjusted to the new system. It can be concluded that e-voting needs to be critically regulated and law support to be implemented in the election.

4. Well-maintained user acceptance through training and education program

The society dimension of e-voting implementation is including people's willingness to use the new system. If there is any rejection, e-voting will be hardly adopted. Jembrana has successfully dealt with this factor by training and using a socialization program. In addition, Jembrana has hundreds of hamlets which are called "banjar". Banjar is a group of hundreds families in the Balinese neighborhood system. The members of banjar are supposed to be close to each other and get involved in various village activities, such as religious ceremonies or cultural performances. For encouraging people and enable enthusiasm in e-voting, the project team had to build intensive communication with banjar leaders; the leaders then followed up e-voting agendas to the society. People were convinced that e-voting cannot be manipulated and is easy to use. The standard operational procedure of Jembrana's e-voting mechanism mentioned that at least one day before election day, voters have to be trained to use new election system through a vote simulation. The candidates of hamlet/village chief usually also contribute to socialize e-voting procedures.

5. Availability of adequate human resources who run e-voting system development

The third and fourth interviewees stated adequate human resources must be available to build well-developed e-voting system. In Jembrana case, the user-friendly system was built by Dinas Hubkominfo in which one of the departments that has many talented IT workers. Since 2006 Jembrana has been supported by 74 IT experts who are qualified in computer science disciplines (Winasa 2010). With the effort of those experts, Jembrana was able to build e-voting system with a low cost and desired quality. They were able to execute Dinas Hubkominfo's programs in e-government developments. Without supporting human resource, e-voting system might have to develop by outsourcing workers where system could be out of government control. How the system would be designed and developed depends on human resource factor.

6. Conclusion

The results of this research concluded that the success of e-voting implementation in Jembrana has been influenced by leadership factor, e-KTP and SIAK development, law and legal aspect, training/education program, and human resources. Those factors are supposed to be formulated in e-voting strategy and to be managed successfully during implementation in order to mitigate risks and to maintain people acceptance. The pilot project contributes in e-voting development in Indonesia and answers pessimist of Indonesians to believe that well-managed e-voting implementation can provide democratic and efficient election. Furthermore, the e-voting system is compatible to be adopted in higher level election because its vote mechanism is similar to gubernatorial election or even presidential election in Indonesia. The government and KPU have to legalize the system and practitioners and academicians should conduct more research to evaluate Jembrana's e-voting.

References

- Alvarez, M. dan Hall, Thad E. (2005). "Lessons and Trends in *E-voting*: Initiatives in the US and Abroad", [online], American Political Science Association Annual Meeting, www.Yate.ca/tech.edu (accessed on 13/04/2011)
- Azhari, Rakhmad. (2005). "E-voting", [online], Fakultas Ilmu Komputer Universitas Indonesia, <http://www.cs.ui.ac.id/WebKuliah/riset/hibah-B/VVCS/pdf/e-Voting.pdf> (accessed on 20/01/2011)
- Chevallier, M., Warynski, M., dan Sandoz, A. (2006). "Success Factors of Geneva's E-voting System". *Electronic J. of e-Government*, vol. 4.
- Efrain, T. dan D. King. (2009). *Introduction to E-commerce* (fifth edition). Prentice Hall, New Jersey
- Hartami, Aprilia. (2011). *Identifikasi Critical Success Factors Implementasi E-voting dengan Studi Kasus Penyelenggaraan Pemilihan Kepala Daerah Kabupaten Jembrana*. Universitas Indonesia, Depok
- Hall, Thad. (2004). "Transitioning to Electronic Voting: Lessons from Georgia's Implementation". Center for Public Policy and Administration, University of Utah
- Ikawati, Yuni. (2011). "Dari Bali dengan E-voting", [online], Kompas.com, <http://cetak.kompas.com/read/2010/03/05/0413038/dari.bali.dengan.e-voting> (accessed 3/05/2011)
- Jawa Post. (2010). "Winasa Penggagas E-voting di Jembrana", [online], Jawa Post National Network, <http://www.jpnn.com/berita.detail-62219> (accessed 23/12/2011)

- Karni, A., Widodo, M. S., and Rukminto, L. (2010). "Pemilu Elektronik: Inisiasi Kreatif Dusun di Bali", [online] Gatra <http://www.gatra.com/artikel.php?id=136994> (accessed 12/02/2011)
- Obaed, Shama. (2011). "Disadvantages of electronic voting", [online], Bangladesh Independent News Network. diakses 11 Juni 2011, <http://www.bdinn.com/articles/disadvantages-of-electronic-voting/> (accessed 11/06/2011)
- Pemkab Jembrana. (2010). Pedoman Sistem E-voting Kabupaten Jembrana. The Official Document of The Local Government of Jembrana Regency, Jembrana
- Pinto, J. and Slevin, D. (1987). Critical Factors in Successful Project Implementation. IEEE Transactionson Engineering Management, 34(1), 22-27
- Prosser, A., Guo, Y., dan Lenhart, J. (2005). "Die Einstellung der Wiener Bevölkerung zu elektronischer Demokratie"; Nr. 02/2005, [online], Department für Informationsverarbeitung und Prozessmanagement - Wirtschaftsuniversität Wien http://epub.wu-wien.ac.at/dyn/virlib/wp/mediate/epub-wu-01_8b1.pdf?ID=epub-wu-01_8b1 (accessed 24/04/2011)
- Remmert, M. (2004). "Toward European Standards on Electronic Voting", [online], The Council of Europe, <http://subs.emis.de/LNI/Proceedings/Proceedings47/Proceeding.GI.47-1.pdf> (accessed 24/12/2011)
- Ristek. (2010). "Pemanfaatan E-voting untuk Pemilu 2014", [online], The Ministry of Research and Technology of The Republic of Indonesia, <http://www.ristek.go.id/?module=News%20News&id=5956> (accessed on 16/12/2010)
- Widodo, Yohanes. (2010). "E-voting, Belajar dari Jembrana", [online], Kompasiana <http://media.kompasiana.com/new-media/2010/04/19/e-voting-belajar-dari-kabupaten-jembrana/> (accessed 3/05/2011)
- Winasa, I Gede. (2010). Penerapan E-voting di Jembrana. Presentation of The Ministry of Home Affair of The Republic of Indonesia
- Yasa, Gede. (2009). "Pilkadus Touch Screen Raih MURI", [online], The Official Website of The Local Government of Jembrana Regency, <http://www.jembranakab.go.id/index.php?module=detailberita&id=597> (accessed 03/05/2010)
- Yin, R.K. (1994). Case Study Research: Design and Methods (second edition). Thousand Oaks, Sage

Comparing Civilian Willingness to Attack Critical Infrastructure on and off Line

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Abstract: As critical infrastructure and governmental resources are increasingly supported by the Internet, there has been a substantial increase in attacks against these sensitive targets. There has also been a concurrent increase in cyberattacks against various governmental and private industry targets by non-state sponsored groups, most notably Anonymous and LulzSec. These conditions facilitate the emergence of civilian cyberwarriors who are encouraged and emboldened by the anonymity afforded on-line to engage in malicious acts against critical infrastructure in countries around the world. As a consequence, there is a need to explore individual willingness to act as a cyberwarrior against foreign and domestic targets, and any relationship this may have to physical acts of protest and violence. This study will compare a sample of students collected at two universities in the United States and Taiwan to understand the rates of participation in physical and cyber-actions against domestic and foreign targets. Implications of this study for legal and governmental security policies will be explored in detail, along with directions for future research to understand emerging threats in cyberspace.

Keywords: cyberattacks, cyberterror, critical infrastructure, nationalism, hacking

1. Introduction

Political action in democratic nations takes various forms, ranging from acts of traditional and accepted non-violent practices like voting to non-violent resistance such as protest or letter writing (Martin 2006; Schmid 1988, 2004). The most extreme forms of action involve planned acts of violence, such as the use of explosive devices or assassinations in support of an ideology (Schmid 2004). Such incidents may be defined as acts of terror, particularly if the targets are located within an actors' home country or designed to affect political and psychological effects on a domestic population (Martin 2006; Schmid 2004).

Technology and the Internet are also changing the nature of political action on and off-line (Britz 2010; Chadwick 2007). The explosion of Computer-Mediated Communications (CMCs) and social media like Facebook make it much easier to send messages to politicians using the Internet at the same rate as postal mail and telephone (Best and Krueger 2005). Virtual social networks also engender the formation of a collective identity that cuts across digital and real spaces which may affect willingness to engage in non-traditional forms of political expression, like protests and demonstrations (Chadwick 2007; Earl and Schussman 2003; Jennings and Zeitner 2003; Stepanova 2011; Van Laer 2010). At the same time, these technologies allow nation states' most vulnerable and critical systems to be attacked with greater secrecy and fewer resources than might otherwise be required off-line (Brodsky and Radvanovsky 2011; Wilson 2008). Thus, traditional forms of non-violent political actions can be directly affected by the use of CMCs.

The substantive harm to people and property that may result from a physical terror attack are largely absent in most cyber-attacks to date (Brenner 2008; Britz 2010). Physical destruction is not, however, necessary in on-line environments since attackers can target the electronic infrastructure that undergird financial institutions or power systems to produce a loss of service (Brenner 2008; Britz 2010; Brodsky and Radvanovsky 2011; Denning 2011). The resulting economic harm or disruption of services produced, combined with concerns over the likelihood that such an attack could be repeated may equal that of a physical terror attack. As a result, the use of destructive attacks against critical infrastructure on-line may be just as harmful as those designed to affect targets in the real world.

Policy-makers have increasingly focused on deterring cyber-attacks performed by state-sponsored actors (Brenner 2008; Department of Defense 2011), though there has been less focus placed on the role of actors with no ties or sponsorship from a nation or military group (Denning 2011; Kilger 2011). Such non-nation-state sponsored actors can leverage technological resources as a force multiplier to engage in non-violent actions like protest, or serious forms of violence such as targeted attacks against infrastructure with a greater magnitude than what may otherwise be possible through real world protest and political action (Brenner 2008; Jordan and Taylor 2004; Kilger 2011). The faceless, borderless nature of the Internet also allows individuals to efficiently mask their real identity and reduce their likelihood of detection (Brenner 2008; Denning 2011). These conditions have given rise to the “civilian cyber-warrior” who can operate with no state-sponsorship to attack various resources within their own government or a foreign nation due to the power differential provided by the Internet and CMCs (Denning 2011; Kilger 2011).

Few researchers have considered what individual factors may predict participation as a cyberwarrior against either their home country or another nation. It is unclear how attitudinal factors such as national pride or belief in group equality, as well as technological skill, may affect the decision to engage in various activities. In addition, few have considered if there is any relationship between willingness to engage in attacks both on and off-line. This exploratory study will examine these issues using an international sample of college students from a Midwestern university. The findings provide initial insights into the prospective factors that predict individual willingness to act as a cyberwarrior, and consider the implication of these findings for policy-makers, intelligence communities, and law enforcement.

2. Methods

Data for this study was generated from a self-report survey administered to undergraduate and graduate students at two universities: one in the United States and the other in Taiwan. The US sample was collected at a large Midwestern university in the spring of 2010 using an on-line survey instrument. Using Dillman's (2007) Tailored Design Method, an email solicitation was delivered to a 25 percent stratified sample of the undergraduate and graduate student population. Respondents received a link to an electronic survey instrument along with the ethical guidelines of the study. A total of 357 individuals responded to the survey, which is a low response rate (5% of all recipients) but consistent with the overall trend of declining survey response rates (Sheehan 2001). The final sample size was 353 respondents due to missing data. The respondents were 60% male, which is slightly higher than the larger university composition (48% male) and closely represents the age distribution of the university (ave. age 22 in both contexts). In addition, the proportion of domestic (89%) to international students (11%) reflects the general university composition as a whole.

Similar methods were used to develop the sample of students in Taiwan. Specifically, a large research institution with comparable enrollments and student size was identified in order to generate a matched sample. Students from nine colleges were sent an email solicitation to the survey during Fall 2011, including 599 undergraduate and 305 graduate students. The response rate for this sample was 50% which was substantively higher than the US, including 254 undergraduate and 202 graduate respondents. This sample resembles the University's demographic composition, and is similar to the US sample as well. Thus, these samples provide a useful point of comparison to examine political action.

Critics commonly question the utility of college samples due to their limited generalizability (see Payne and Chappell 2008). College students provide a pertinent sample population, however, for research on computer skill, early adoption of technology, and participation in cyber-deviance though they are frequently used in criminological research as a whole (Higgins and Wilson 2006; Hinduja 2001; Holt, Burruss, and Bossler 2010; Skinner and Fream 1997). In addition, young people are more likely to engage in protest activities (Wiltfang and McAdam 1991), and are less likely to have “crystallized attitudes and less formulated senses of self” (Sears 1986). Thus, college students are an appropriate population to explore the predictors for political action on and off-line.

3. Measurement

In order to examine willingness to engage in the spectrum of politically motivated action on and off-line, respondents in the study were presented with scenarios involving nation-state actions causing harm to the citizens of their home country. The study design was a 2x2 factor design that involved the type of attack and the identity of the nation-state causing the harm. A scenario design was employed

due to the relatively limited proportion of individuals actively engaging in attacks against critical infrastructure on and off-line (Brenner 2008; Britz 2010). Scenarios have been used in a variety of criminological and political science research (Fishbein and Ajzen 1975; Nagin and Paternoster 1993; Piquero and Bouffard 2007). In fact, scenario-based measures of future behavior appear to be valid constructs for actual behavior (Fishbein and Ajzen 1975; Kim and Hunter 1993). Thus, utilizing a scenario-based measure is a reasonable data source to explore the phenomena of attacks against nation-states in cyberspace and the real world.

The first scenario presented to respondents required them to consider how they might react under the following conditions:

Imagine that the country that you most closely associate as your home country or homeland has recently promoted national policies and taken physical actions that have had negative consequences to your country. These policies and actions have resulted in significant hardships for the people in your home country. What actions do you think would be appropriate for you to take against your home country given their policies and physical actions? You may choose as many actions as you think the situation warrants. In this scenario, you may assume that you have the necessary skills to carry out any of the actions below.

Respondents were then asked to select as many physical actions they would take against their home country in response to the perceived injustice as they felt necessary from eight items: 1) do nothing – let your country correct its actions on its own; 2) write a letter to your home country's government protesting their actions; 3) participate in a protest against your home country at an anti-government rally; 4) protest at your home country's capitol building; 5) confront one of your home country's senior government officials about their policies; 6) sneak into a military base in your home country to write slogans on buildings and vehicles; 7) physically damage an electrical power substation in your home country; and 8) damage a government building in your home country with an explosive device.

In addition to physical activities, respondents were also asked:

“what on-line activities do you think would be appropriate for you to take against your home country given their policies and physical actions? You may choose as many actions as you think the situation warrants. In this scenario, you may assume that you have the necessary skills to carry out any of the actions below.”

The respondents were presented with nine actions to perform in a cyber environment: 1) do nothing – let your country correct its actions on its own; 2) post a comment on a social networking website like Facebook or Twitter that criticizes your home country's government; 3) deface the personal website of an important government official for your home country; 4) deface an important official government website for your home country; 5) compromise the server of a bank in your home country and withdraw money to give to the victims of the government's policies and actions; 6) search your home country's government servers for secret papers that you might be able to use to embarrass the government; 7) compromise one or more of your home country's military servers and make changes that might temporarily affect their military readiness; 8) compromise one of your home country's regional power grids which results in a temporary power blackout in parts of your home country; and 9) compromise a nuclear power plant system that results in a small release of radioactivity in your home country.

The same language was used to assess individual willingness to engage in actions against a foreign nation-state inflicting harm on their homeland. This scenario utilized the fictitious nation of Bagaria as the target of attacks in order to avoid prospective respondents' biases against either foreign nations or ethnic or racial groups. The following language was used in this Bagarian scenario:

Imagine that the country of Bagaria has recently promoted national policies and taken physical actions that have had negative consequences to the country that you most closely associate as your home country or homeland. These policies and actions have also resulted in significant hardships for the people in your home country.

What actions do you think would be appropriate for you to take against Bagaria given their policies and physical actions against your home country? You may choose as many actions as you think the

situation warrants. In this scenario, you may assume that you have the necessary skills to carry out any of the actions below.

The same response sets for both physical and cyber action were presented to the respondent in order to compare variations in action based on foreign or domestic targets.

4. Findings

First, we compare the respondents' willingness to engage in various attacks by country, and consider significant differences through the use of Chi Square models (see Table 1). These results demonstrate substantive differences in willingness to engage in physical attacks. Specifically US respondents were more willing to both write letters to the media, engage in protest activities, and travel to protest against their home country (see Table 1). Less than 25 percent of the Taiwanese respondents were willing to engage in these actions relative to the over 50 percent of US respondents. The two countries respondents reported similar willingness to confront government officials, though US respondents were more likely to engage in this activity. A very small proportion of both samples were willing to engage in the most serious actions, including sneaking into military bases and engaging in bombings. In fact, there were no significant differences between the two samples on these items.

Table 1: Reported willingness to engage in homeland physical actions

Response Type	US	(N-357)	Taiwan	(N-456)	Sig.
Do Nothing	116	(32.5%)	183	(40.1%)	.025
Write a letter	248	(69.5%)	101	(22.2%)	.000
Participate in a protest	223	(62.5%)	116	(25.4%)	.000
Travel to protest at the capitol	194	(54.3%)	66	(14.5%)	.000
Confront a government official	107	(30.0%)	87	(19.1%)	.000
Sneak into a base	10	(2.8%)	12	(2.6%)	.882
Damage a power substation	6	(1.7%)	15	(3.3%)	.152
Damage with explosives	3	(0.8%)	12	(2.6%)	.060

In addition, the US respondents were more likely to engage in letter writing and physical protest actions against Bagaria relative to the Taiwanese sample (see Table 2). There were no differences across the samples concerning confronting a government official though the Taiwanese respondents were more likely to engage in the most serious forms of physical attack against Bagaria. Both countries reported generally low willingness to engage in serious actions, though the slightly higher response rates from Taiwan suggest a prospective difference between these nations in the use of political violence.

Table 2: Reported willingness to engage in foreign physical actions

Response Type	US	Percentage (N-357)	Taiwan	Percentage (N-456)	Sig
Do Nothing	151	(42.3%)	166	(36.5%)	.092
Write a letter	192	(53.8%)	98	(21.5%)	.000
Participate in a protest	207	(58.0%)	131	(28.8%)	.000
Travel to protest at the capitol	90	(25.2%)	37	(8.1%)	.000
Confront a government official	68	(19.1%)	88	(19.3%)	.103
Sneak into a base	7	(2.0%)	18	(3.9%)	.038
Damage a power substation	8	(2.2%)	23	(5.0%)	.000
Damage with explosives	2	(0.6%)	29	(6.4%)	.000

The response rates were somewhat similar concerning cyber-actions against their home country (see Table 3). It is important to note that the most common activity reported by respondents in both samples were posting messages on Facebook or social networking sites to express their opinions. US

respondents were more willing to engage in this activity overall, as well as engage in web defacements against political and government websites. Taiwanese respondents were more willing to engage in compromises against various targets, though there were no significant differences between the two nations concerning compromising government or military servers and power systems. As the form of attack increased in severity, fewer respondents were willing to perform that behavior.

Table 3: Reported willingness to engage in homeland cyber actions

Response Type	US	Percentage (N-357)	Taiwan	Percentage (N-456)	Sig.
Do nothing	131	(36.69%)	163	(35.7%)	.780
Post on Facebook	276	(77.3%)	202	(44.3%)	.000
Deface a politician's website	47	(13.2%)	22	(4.8%)	.000
Deface a government website	43	(12.0%)	30	(6.6%)	.007
Compromise a bank server	15	(4.2%)	35	(7.7%)	.041
Compromise a government server	35	(9.8%)	47	(10.4%)	.797
Compromise a military server	16	(4.5%)	20	(4.4%)	.947
Compromise a power grid	6	(1.7%)	18	(3.9%)	.058
Compromise a nuclear power plant	3	(0.8%)	7	(1.5%)	.372

There were substantive differences between the two nations concerning cyber-activities against Bagarian targets (see Table 4). US respondents were more likely to post messages on Facebook and engage in web defacements, though Taiwanese respondents were more likely to engage in all other forms of compromise. This is substantively different from domestic attack targets where there were no significant differences in the samples based on the most severe attacks. In fact, respondents from Taiwan were much more willing to engage in compromises against power grids and systems than those from the US. This is a key difference between the two nations that requires greater exposition.

Table 4: Reported willingness to engage in foreign cyber actions

Response Type	US	Percentage (N-357)	Taiwan	Percentage (N-456)	Sig.
Do nothing	140	(39.2%)	134	(29.4%)	.003
Post on Facebook	272	(76.2%)	203	(44.7%)	.000
Deface a politician's website	41	(11.5%)	23	(5.0%)	.001
Deface a government website	39	(10.9%)	37	(8.1%)	.172
Compromise a bank server	18	(5.0%)	45	(9.9%)	.011
Response Type	US	Percentage (N-357)	Taiwan	Percentage (N-456)	Sig
Compromise a government server	35	(9.8%)	68	(14.9%)	.030
Compromise a military server	24	(6.7%)	50	(11.0%)	.036
Compromise a power grid	11	(3.1%)	41	(9.0%)	.001
Compromise a nuclear power plant	1	(0.3%)	16	(3.5%)	.001

To further understand the nature of political action, the total number of attacks each respondent was willing to perform was calculated. Each form of physical or cyber attack for each target was added, with the exception of the "do nothing" item to assess willingness to engage in attacks. T-tests were conducted to compare the means for the US and Taiwan respectively. Across all categories, US

respondents were more likely to perform multiple attacks relative to the Taiwanese sample. With regard to physical action, US respondents reported a higher number of attacks against both their home country (US = 2.215; Taiwan = 0.896; T-test sig. $\leq .001$) and Bagaria (US = 1.607; Taiwan = .947; T-test sig $\leq .001$). The two countries were somewhat closer in terms of the overall number of cyber-action, though the US respondents reported a willingness to engage in more actions than those from Taiwan. The US respondents were more likely to engage in multiple domestic cyberattacks (US = 1.235; Taiwan = 0.837; T-test sig. $\leq .000$), though the two groups were relatively similar concerning actions against Bagaria (US = 1.235; Taiwan = 1.064; T-test sig=.048).

5. Discussion and conclusions

As nations across the globe increasingly depend on technology to support economic, political, and social action, opportunities for non-violent and extreme forms of political action by civilians on and off-line have risen dramatically. Few researchers have considered if there are variations in the willingness of individuals from different nations to engage in protests and other actions in their home country or foreign targets. This study sought to explore these issues using a scenario-based research instrument with two samples of college students from the US and Taiwan. The findings suggest that there are substantive variations in traditional and non-traditional political actions on and off-line against either their home country or a foreign nation. For instance, US citizens were more likely to post messages on-Facebook or write letters to various media outlets, and engage in physical protests. In addition, US respondents were more likely to engage in multiple forms of attack suggesting a greater willingness to take action against domestic and international targets. This may be a consequence of a greater tolerance for discussion and criticism of governmental policies and practices in the U.S. in open settings without fear of losing face (Putnam 2000).

A very small percentage of respondents across both samples were willing to engage in serious acts of violence in the real world or on-line. Overall, these results are in keeping with the extremely small number of individuals who engage in acts of terror or serious political violence (Martin 2006). A minority of US respondents would perform either virtual or physical attacks against power grids and nuclear plants. Those in the Taiwan sample were more inclined to engage in serious attacks against Bagarian targets, particularly in on-line environments. This difference may be a function of Taiwan's proximity to China, where politically motivated hacking against foreign targets is an extremely common and accepted (Brenner 2008). This may increase the willingness of individuals, particularly technologically savvy youth to engage in cyberattacks against foreign governments relative to the US. Law enforcement and intelligence agencies must begin to understand how individual propensity to engage in attacks may be affected by macro and micro-level factors unique to a given nation.

In order to better understand the issues identified in this analysis, further research is needed. Specifically, multivariate models must be developed that consider the relationships between various individual level factors such as nationalism, antagonism towards outside groups, technical skill in computers, and individual willingness to engage in specific cyber and physical attacks. Such information can expand our understanding of the role that political identity and technological skill play in on and off-line political action. Furthermore, this will improve our understanding of the differences between these two nations to engage in political action. There is a need for additional data sets to expand the limited generalizability of these findings. Data collection from various countries around the world with different economic and political conditions can help to clarify the role of technological sophistication and counterculture attitudes on individual willingness to engage in political action online.

References

- Best, S. J. and Krueger, B. S. (2005) "Analyzing the representativeness of internet political participation", *Political Behavior*, 27, pp 183-216.
- Brenner, S. W. (2008) *Cyberthreats: The emerging fault lines of the nation state*, New York, Oxford University Press.
- Britz, M. T. (2010). *Terrorism and technology: Operationalizing cyberterrorism and identifying concepts*. In T. J. Holt (Ed.), *Crime On-Line: Correlates, Causes, and Context* (pp. 193-220). Raleigh, NC: Carolina Academic Press, 2010.
- Brodsky, J. and Radvanovsky, R. (2011) "*Control Systems Security*", In Holt, T. J., and Schell, B. (eds.), *Corporate Hacking and Technology-Driven Crime: Social Dynamics and Implications*, Hershey, PA: IGI-Global.
- Chadwick, A. (2007) "*Digital network repertoires and organizational hybridity*", *Political Communication*, Vol 24, pp 283-301.

- Denning, D. E. (2011) "Cyber-conflict as an Emergent Social Problem", In Holt, T. J., and Schell, B. (eds.), Corporate Hacking and Technology-Driven Crime: Social Dynamics and Implications, Hershey, PA: IGI-Global.
- Department of Defense. "Department of Defense Strategy for Operating in Cyberspace", Washington DC: U. S. Department of Defense. [Online] <http://www.defense.gov/news/d20110714cyber.pdf> (accessed on 07/10/11).
- Dillman, D. A. (2007) Mail and internet surveys: The tailored design method, Hoboken, NJ: John Wiley and Sons, Inc.
- Earl, J. and Schussman, A. (2003). "The New Site of Activism: On-line Organizations, Movement Entrepreneurs and the Changing Location of Social Movement Decision-Making", in P. G. Coy, P. G. (ed.) Consensus Decision Making, Northern Ireland and Indigenous Movements, London: JAI Press.
- Fishbein, M. J. and Ajzen, I. A. (1975) Belief, attitude, intention, and behavior: An introduction to theory and research, Reading, MA: Addison Wesley Publishing..
- Higgins, G. E. and Wilson, A. L. (2006) "Low self-control, moral beliefs, and social learning theory in university students' intentions to pirate software", Security Journal, Vol 19, pp 75-92.
- Hinduja, S. (2001) "Correlates of Internet software piracy", Journal of Contemporary Criminal Justice, Vol 17, pp 369-382.
- Holt, T. J., Burruss, G. W. and Bossler, A. M. (2010) "Social learning and cyber deviance: Examining the importance of a full social learning model in the virtual world", Journal of Crime and Justice, Vol 33, pp 31-62.
- Jennings, K. M. and Zeitner, V. (2003) "Internet use and civic engagement: A longitudinal analysis", Public Opinion Quarterly, Vol 67, pp 311-334.
- Jordan, T. and Taylor, P. (2004) Hacktivism and cyber wars, London: Routledge.
- Kilger, M. (2011) "Social dynamics and the future of technology-driven crime", in Holt, T. J., and Schell, B. (eds.), Corporate Hacking and Technology-Driven Crime: Social Dynamics and Implications, Hershey, PA: IGI-Global.
- Kim, M. S. and Hunter, J. E. (1993) "Relationships among attitudes, behavioral intentions, and behavior: A meta-analysis of past research Part 2", Communications Research, Vol 20, pp 331-364.
- Martin, G. (2006) Understanding terrorism: Challenges, perspectives, and issues, 2nd Edition. Thousand Oaks, CA: Sage.
- Nagin, D. and Paternoster, R. (1993) "Enduring individual differences and rational choice theories of crime", Law and Society Review, Vol 27, pp 467-496.
- Payne, B. K. and Chappell, A. (2008) "Using student samples in criminological research", Journal of Criminal Justice Education, Vol 19, pp 175-192.
- Piquero, A. R. and Bouffard, J. A. (2007) "Something old, something new: A preliminary investigation of Hirschi's redefined self-control", Justice Quarterly, Vol 24, pp 1-27.
- Schmid, A. P. (1988). Political Terrorism. Amsterdam: North Holland Press.
- Schmid, A. P. (2004) "Frameworks for conceptualising terrorism." Terrorism and Political Violence, Vol 16, pp 197-221.
- Sheehan, K. B. (2001) "E-mail survey response rates: A review", Journal of Computer Mediated Communication, Vol 6, [online] <http://onlinelibrary.wiley.com/doi/10.1111/j.1083.6101.2001.tb00117.x/full> <http://www.ascusc.org/jcmc/vol6/issue2/sheehan.html> (accessed 05/11/2005)
- Sears, D. O. (1986) "College sophomores in the laboratory: Influences of a narrow data base on social psychology's view of human nature", Journal of Personality and Social Psychology, Vol 51, pp 515-530.
- Skinner, W. F. and Fream, A. M. (1997) "A social learning theory analysis of computer crime among college students", Journal of Research in Crime and Delinquency, Vol 34, pp 495-518.
- Stepanova, E. (2011) "The role of information communications technology in the "Arab Spring": Implications beyond the region", PONARS Eurasia Policy Memo No. 159. [online] http://www.gwu.edu/~ieresgwu/assets/docs/ponars/pepm_159.pdf (accessed on 09/01/11).
- Van Laer, J. (2010) "Activists online and offline: The Internet as an information channel for protest demonstrations", Mobilization: An International Journal, Vol 15, pp 347-366.
- Wilson, C. (2008) Botnets cybercrime, and cyberterrorism: Vulnerabilities and policy issues for Congress, Congressional Research Service Report RL32114.
- Wiltfang, G. and McAdam, D. (1991) "Distinguishing cost and risk in sanctuary activism", Social Forces Vol 69, pp 987-1010.

Comparative Analysis of ICT in the Public Sector in Estonia and Republic of Macedonia

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Abstract: Computer based information systems have been increasingly proposed for solving problems in the public sector facing governments around the world. The challenges facing developing countries are even greater. Developing countries try to use ICT to help them skip whole stages in the development of their economies, and to approach the developed countries. This paper intends to present a comparative analysis of the role of ICT in the public sector in the case of two developing countries, Estonia and Republic of Macedonia. Estonia is a country with a similar historical and socio-economic setting as the Republic of Macedonia. Estonia has achieved significant economic growth in the last 20 years, and its public sector is advanced user of ICT. Macedonia lags behind Estonia, in economic growth and in the application of ICT. Our thesis is that one of the factors that led to these differences between the two countries is the intensity of application of ICT in the public sector, in several ways: the government as a user of ICT; the government as a provider of ICT services to the individuals, private companies, NGOs, and others in the public sector; and the government as a creator of a political framework, legal framework, and climate for the diffusion and application of ICT. The comparative analysis is focused on five areas, which we consider are key to explaining the differences between two countries: the policies and legal framework regarding ICT, organizational structure of the institutions in charge of ICT, the degree of development of information society, the budget allocated for ICT development and projects, and the contribution of ICT in the governance of the public sector. Furthermore, we will compare the educational structure of the labor force in the two countries, as an important complementary asset for the application of ICT. The analysis will be based on statistical data from multiple sources and publicly available information on the situation concerning the application of ICT in the public sector in both countries. In the comparative analysis section we will offer benchmarks for Macedonia to accelerate the process of the development of ICT application. At the end of this paper, we will propose answers, based on this analysis, which are the reasons that led Estonia to its success.

Keywords: information and communication technology, public sector, strategy, Republic of Macedonia, Estonia

1. Introduction

The debates about the position and role of information and communication technology (ICT) in the economy, the state and society have become an important part of the contemporary way of global thinking. Computer based information systems have increasingly been proposed for solving problems in the public sector facing governments around the world. The challenges facing the developing countries are even greater. The developing countries try to use ICT to help them skip whole stages in the development of their economies, and to approach the developed countries (Pohjola 2002). There are various paths to meet that goal. The governments in a number of countries invest more in research and development of the ICT industry. In other countries the government cooperates closely with the private sector in the application of ICT (W'O Okot-Uma 2004). Some countries are successful in this process, some are less successful.

Most of the theoretical and empirical research on the economic benefits of ICT, represented in the academic and policy-related publications, conclude that ICT is indeed a key driver for economic growth, at least for the countries that are not at the bottom of the Economic ladder (Kuppusamy et al. 2009). What are the reasons that one country is more successful than another in the application of ICT and, consequently, in the overall economic growth? We will try to offer some of the answers by comparing the cases of Macedonia and Estonia. These two countries are suitable for a comparative analysis. They are of similar size and have a similar history – both were established as independent states after the fall of communism: both were subject to a socialist planned state economy, lacked private initiative, and experienced the transition from socialism to capitalism. Some of the basic data for both countries are shown in Table 1.

Estonia, in less than 20 years, has become one of the leading countries in Eastern Europe. The Estonian economy has experienced almost double-digit growth for years (i.e. 11.74% in 1997, 9.974% in 2000, 7.516% in 2001, 10.562% in 2006), which applies that it is one of the fastest growing economies in the world, until the world crisis in 2008. Today it successfully copes with the effects of

the crisis and achieves again positive growth rates. Much of this success of Estonia is due to the application of ICT, which plays an important role in the country.

Table 1: Estonia and Macedonia, basic data, 2010 (European Commission 2011; Economy Watch 2010; State Statistical Office of Republic of Macedonia 2011; Trading Economics 2011; The World Bank 2008; Ministry of Education and Science of Republic of Macedonia 2011; OECD 2011)

Criteria	Estonia	Macedonia
Area	45,000 km ²	25,713 km ²
Ethnic groups	Estonian 69% Russian 25,5% Others 5,5%	Macedonian 64,2% Albanian 25,2% Others 10,6%
Population	1,340,100	2,077,328
GDP	\$19,779 billion (2010) \$3,775 billion (1995)	\$9.108 billion (2010) \$4,457 billion (1995)
GDP – real growth rate	3,1%	0,7%
GDP per capita	\$14,836	\$4,431
Unemployment rate	5% (2008) 16,9% (2010) 11% (2011)	35% (2008) 32% (2010) 31,3% (2011)
Education expenditure (% of GNI)	4,9%	4,42%
Gross domestic expenditure on R&D (% of GDP)	1,44%	0,2%

Macedonia, in comparison to Estonia, experienced modest growth rates in the past 20 years, from negative ones in the beginning of the 1990s (i.e. -7,5% in 1993), to the highest one, 5,9% in 2007. Macedonia lags in the application of ICT in the public sector, and the private sector lags even further behind the public sector: there are no famous success stories from the IT industry as in the case of Estonia.

Our thesis is that one of the factors that led to these differences between the two countries is the intensity of application of ICT in the public sector (besides other relevant factors, such as human capital/skills, economic infrastructure and policy, governance style, political stability etc., which are ignored for the purpose of this empirical testing), in several ways: the government as a user of ICT; the government as a provider of ICT services; and the government as a creator of a political framework, legal framework, and climate for the diffusion and application of ICT. In this paper we undertake a comparative analysis of ICT application, and use the Estonian case as a guideline for the development of the application of ICT in the Republic of Macedonia. We will focus on a comparative analysis of the policies and legal framework, organizational structure of the institutions in charge of ICT, the degree of development of the information society, the budget allocated for ICT development and projects, and the contribution of ICT in the governance of the public sector.

2. The situation in Estonia

Estonia is considered as one of the leaders in the application of ICT in Europe and is number one among Eastern European countries, according to a number of rankings (Economist Intelligence Unit 2010).

To gain an insight into the situation concerning the application of ICT in the country, we will first review the political and legal framework, strategies and implementation plans on ICT in Estonia.

The main document in the creation of the Estonian ICT policy is the Estonian Information Society Strategy 2013, which defined long-term objectives and measures necessary for the development of an information society. The strategy which preceded this one and during which great progress was recorded was titled the Principles of Estonian Information Policy 2004-2006. The other important document is the Implementation plan of the Estonian Information Society Strategy, which defined the priorities and objectives in the short term arising from the Strategy, taking into account the current situation. The implementation plan is the foundation for all government institutions to submit proposals

to the government - accompanied by a timetable, funding sources and responsibilities regarding the implementation of annual programs.

Although the country has made significant progress, the goals set ahead are even higher. For each component of the Strategy, there are planned goals, supported by specific activities (European Commission 2011), i.e.:

- By 2013, 75 % of the Estonian residents should be using the Internet, while household Internet penetration should amount to 70 %.
- By 2013, the productivity per employee in Estonian enterprises should account for 75 % of the EU average and that the share of ICT enterprises in the national GDP should amount to 15 %.
- By 2013, the strategy sets the objective of 80 % of citizen satisfaction and 95 % of business satisfaction with regard to the use of public sector e-Services.

To enable the changes necessary for the promotion of an information society, a number of laws were enacted. The list of the most important ones is given in the Table 2. Note that most of the legal framework was adopted during the 1990s, in the early years of introduction of e-Government in the developed countries in the world.

Table 2: The List of adopted legislation related to ICT in Estonia (Krull 2003: 58)

Name of act / policy - ... Act	Passed on:
Copyright	11/11/1992
Consumer Protection	15/12/1993
Broadcasting	19/05/1994
Citizenship	19/01/1995
Personal Data Protection	12/06/1996
Databases	12/03/1997
Official Statistics	11/07/1997
Archives	25/03/1998
State Gazette	20/01/1999
State Secrets	26/01/1999
Telecommunication	9/02/2000
Digital Signature	8/03/2000
Population Register	31/05/2000
Public Information	15/11/2000
State Liability	2/05/2001
Cable Distribution	31/05/2001
Information Security Services	14/04/2004
Electronic Communications	8/12/2004
Public Procurement	01/05/2007

As to the organizational structure of the institutions and bodies in charge of ICT in the public sector in Estonia, the institution responsible for overall coordination of ICT is the Ministry of Economic Affairs and Communications, i.e. the Department of State information systems. The tasks of this department cover coordination of activities related to state IT policy and development plans in the field of information systems in the public sector, including budgets, IT legislation, standardization, procurement procedures etc.

The Estonian Informatics centre is an organizational unit in the above-mentioned Ministry. It is responsible for the state registers, computer networks and data communications, monitoring the situation of IT in Estonia and other activities on the tactical and operational level.

Several governmental bodies concerning ICT were established: IT Council of Ministries, IT Council of counties and Estonian Informatics Council, composed of experts in the field. The Estonian Informatics Council acts as a body for the implementation of the general coordination of the state information

policy. The organizational and hierarchical structure, together with the interconnection of the institutions and bodies is presented on Figure 1.

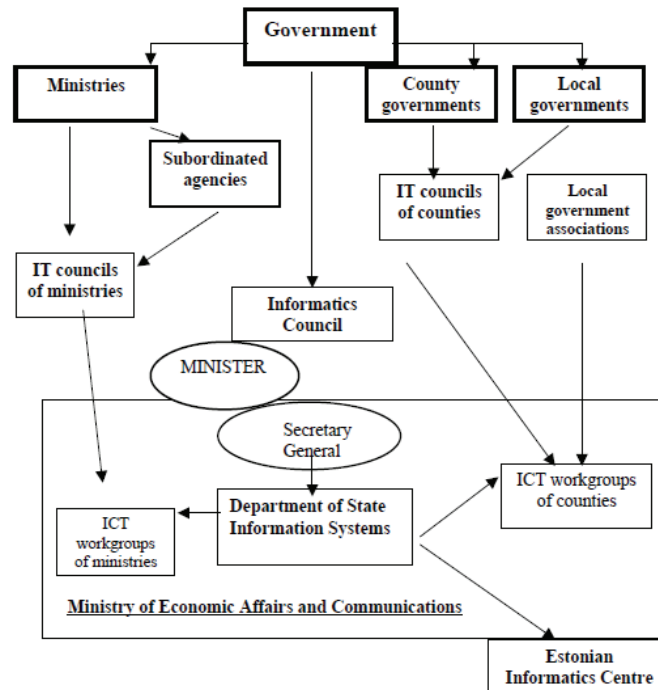


Figure 1: Simplified organizational structure of ICT management in Estonia (Krull 2003: 61)

Because of the degree of development of the information society, we can say that Estonia has achieved significant progress in this direction. Estonia constantly receives positive assessments relating to the following achievements (Estonian State information system 2006): advanced communications network and good Internet availability; innovative mindset in the public sector and high-quality IT solutions with service-oriented approach; high-quality IT solutions in the private sector, in particular Internet banking and mobile applications; success stories in the Estonian ICT sector (i.e. internet communications company Skype); wide use of ICT in education as a result of the Tiger Leap programme; the eagerness of the Estonians to use innovative solutions. One of the achievements should be emphasized - the largest functioning public key infrastructure in Europe, based on the use of electronic certificates maintained on the national ID card. More than 80% of the population possesses an ID card that enables both electronic authentication and digital signing, and it is widely used as a legal travel document in EU, a national health insurance card, for e-Banking, as a pre-paid public transport ticket, for i-Voting, for medical e-Prescriptions, for digital signatures and accessing government databases to check one's medical records, file taxes etc. Relevant legislation is in place, giving the digital signature equal power with the handwritten one, and imposing a responsibility on public authorities to accept digitally signed documents.

As for the ICT budget, in 2009 and 2010, the Estonian government allocated 40 million euros from the budget for the development of an information society, and in 2007-2013 it provided 20 million euros annually, or approximately 136 million euros for the period.

With regard to the development of the governance of the public sector, ICT plays a significant role in Estonia. The main objective of the current Information Society Strategy in Estonia is to focus on an integrated e-Society, and to abandon the model of individual, unrelated projects. In Estonia, the leader in the application of ICT is the public sector, but the e-Society is developed in cooperation with the public, private and NGO sectors, with emphasis on the integration of the marginal groups and non-developed regions. The public sector is in the process of reorganization of its internal business processes. The level of sophistication of the on-line public services in Estonia has an average of 4,3 (Figure 2.), which is a very high result. The Strategy pays considerable attention to the Estonian language and culture, and to the preservation of human rights and personal security. A very important feature of the Strategy is that the Information society and the opportunities it offers has to be taken into account when formulating policies in other sectors.

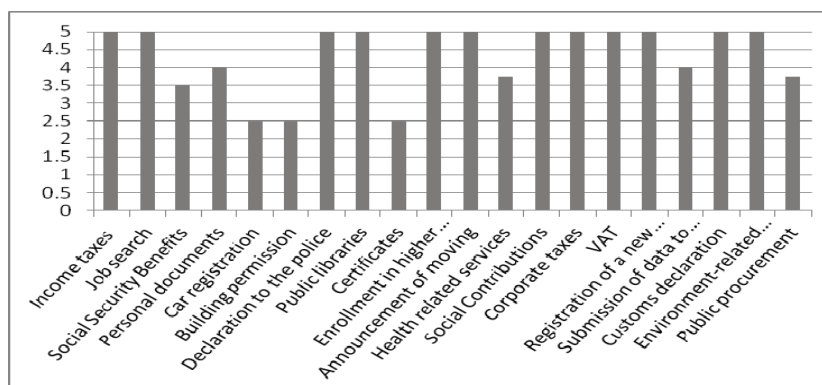


Figure 2: Sophistication rate of on-line public services in Estonia (European Commission, Directorate General for Information Society and Media 2007)

3. The situation in the Republic of Macedonia

The situation in the Republic of Macedonia is described in this section. The political framework on ICT application in Macedonia is based on a number of documents. The most important documents of the Government of the Republic of Macedonia concerning the development of an information society are:

- National Strategy for an Information Society Development and Action Plan, 04/2005;
- National Strategy for the Development of Electronic Communications with Information Technologies, 03/2007;
- National strategy for the next generation broadband Internet, 02/2009;
- National Strategy for e-Government 2010-2012, 01/2010;
- National Strategy for e-Inclusion 2011-2014, 05/2011.

These documents are written in accordance with the priorities of the EU initiative i2010, and suggest measures for the promotion and development of an inclusive information society. The legal framework that supports ICT application in the Republic of Macedonia is given in Table 3. What one notices is that all of the laws were passed in the first decade of the 21st century, and none of the important laws were passed in the 1990s, as is the case of Estonia. As for the organizational structure of the institutions and the bodies in charge of ICT in the Republic of Macedonia, the most important move towards the development of an information society was the establishment of a Ministry of information society in 2008. In 2010 it became the line ministry in charge of public administration and was renamed the Ministry of information society and administration. The Ministry of information society and administration (Ministry of Information Society and Administration of the Republic of Macedonia 2011) performs tasks related to: the development and promotion of an information society; creating and keeping a register of information and communication systems and IT equipment within the state administration; integrated information and communications networks, databases, interconnection and exchange of information; the security and development aspects of the infrastructure; monitoring the situation with ICT and the introduction of international standards; telecommunications and telecommunications infrastructure; broadcasting and broadcasting infrastructure; as well as several other tasks related to the public administration governance.

Table 3: The list of adopted legislation related to ICT in Macedonia (Ministry of Information Society and Administration of Republic of Macedonia 2011)

Name of act / policy – Law on:	Passed on:
Data in Electronic Form and Electronic Signature	14/02/2001
Personal Data Protection	25/01/2005
Electronic Communications	5/03/2005
Public Information	1/09/2006
Interception of Communications	15/11/2006
Electronic Commerce	26/10/2007
Electronic Management	18/08/2009

The Ministry of an information society and administration undertakes a number of projects, divided in several categories: e-Infrastructure, e-Government, e-Business, e-Health, e-Education, e-Citizens and e-Documents. One has to mention that a significant part of the projects that are undertaken in other ministries in the Government of the Republic of Macedonia are ICT enabled and are coordinated with the Ministry of information society and administration.

The degree of development of the information society in Macedonia, apart from the written strategies and documents, include the following:

- The broadband Internet market is relatively developed, the number of households and businesses using broadband is four times higher than those using dial-up Internet access;
- The leader in using ICT in the Republic of Macedonia is the public sector, ahead of the private sector and the citizens;
- The public sector institutions have twice the percentage of web sites in comparison to private companies;
- The e-Procurement and e-Commerce has a very small, single-digit percentage in all sectors;
- The digital divide issue exists, mostly according to the age structure and urban/rural digital divide;
- A computer for every student programme has been conducted in every primary and secondary school in Macedonia, but the project is not fully successful, results are still expected because of the lack of complementary assets, such as organization, management, IT skills of teachers and lack of appropriate educational software;
- The number of companies and individuals that use electronic authentication and digital signing is very small. Relevant legislation is not in place, and a digital signature has not equal power as the handwritten one, i.e. a digital invoice is not equally valid as a hardcopy one.

As to the financial resources from the budget, there is no available information on the finances spent on ICT projects in the public sector from the budget of the Republic of Macedonia. However, there is one available indicator, concerning the total ICT spending in Macedonia, including the IT industry and telecommunications industry, in the public sector, private sector, and households in 2009, Macedonia spent about 56 million euros (Ministry of Economy of the Republic of Macedonia 2009).

Regarding the development of governance in the public sector, the role of ICT in Macedonia is still modest. Namely, the biggest beneficiaries of the services of the e-Government are the public institutions themselves, then the private sector companies while the proportion of citizens who use the services of the e-Government is in third place. E-Government services are mostly used to get information and to download forms, and a small part concerns to the full electronic operation of the administrative procedures. Aforementioned facts place Macedonia in the first phase of most models of e-Government (Layne and Lee 2001; W'O Okot-Uma 2004) that is called Catalogue with a few isolated breakthroughs in the second phase called Transaction. The comparative analysis of the application of ICT in countries in Southeast Europe shows that under the infrastructure index, the index of readiness for e-government and web index, Macedonia places in the middle of tables depicting the situation in the region. Data for the index of e-participation and sophistication of e-services (average 2, as shown in Figure 3.) place Macedonia among the last countries in the region.

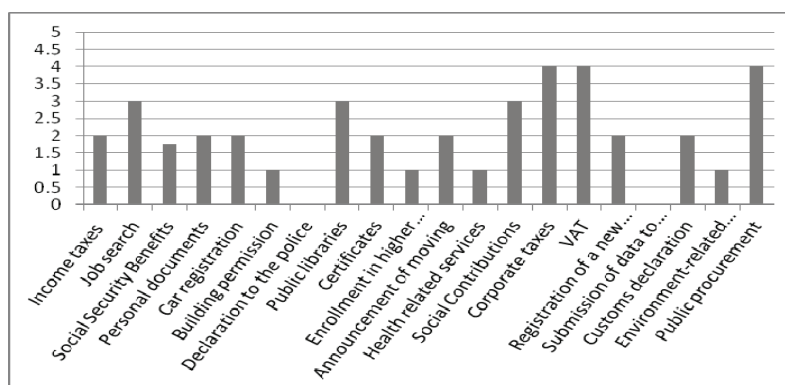


Figure 3: Sophistication rate of on-line public services in Macedonia in 2008 (Ministry of Information Society and Administration of the Republic of Macedonia 2010)

4. Comparative analysis and discussion

The previous two sections presented an analysis of five areas that we think are key areas through which application of ICT in a country can be tracked:

- Policies and legal framework;
- Organizational structure of the institutions in charge of ICT;
- Degree of development of information society;
- Budget allocated for ICT development and projects; and
- Contribution of ICT in the governance of the public sector.

The statistical data and its analysis presented in this section show the results, i.e. maturity of ICT application, demonstrated behavior, realized progress. Additionally, we compare the level of education in the two countries, especially tertiary education, as we consider that this is one of the factors that lead to differences in the level of ICT application between the two countries.

The policies in the two countries are in line with EU documents and recommendations, and both are high quality ones. On the level of written strategies and documents Macedonia is not behind the developed EU countries. One thing that Macedonia lacks in its Strategies and Action plans is a stable allocation of resources and budget, which is very important for the execution of the strategy. As for the legal framework, we notice that Macedonia lags behind Estonia approximately ten years in enacting the ICT related laws. Also, Macedonia lacks an important digital invoice and equality of digital and hardcopy document legislation.

The comparative analysis of the organizational structure of institutions dealing with ICT in the public sector in the two countries shows that the organizational structure of the Ministry of information society and administration in the Republic of Macedonia is not publicly available, unlike the organizational structure in Estonia. Non-formal sources, like LinkedIn profiles of the employees support the assertion that there is some sort of project organization. Available information indicates a lack of coordination among government institutions, and a lack of institutions responsible for the coordination and evaluation of implemented policies, not only in the Ministry, but in the public sector in general. The Council for Information Society, which is of great significance for promoting the information society in Macedonia, as far as there is information on Internet, held one meeting in March 2009 and there have been no activities ever since, contrary to the information society fundamental commitment to transparency.

We will concentrate further on the explication of the degree of development of an information society. The most important indicators for the application of ICT in Macedonia as well as those in Estonia and the European Union average are presented and compared in Table 4.

Table 4: ICT parameters in Macedonia, Estonia and EU27 average, 2009 (State Statistical Office of Republic of Macedonia 2011; Ministry of Economy of Republic of Macedonia 2009; European Commission, Directorate General for Information Society and Media 2009)

State / Criteria	Estonia	Macedonia	EU27 average	Rate Estonia/ Macedonia
% of households with broadband Internet access	58%	33,8%	60%	1,7
% of enterprises with broadband Internet access	88%	75%	81%	1,2
% of individuals using e-Government	34%	26%	28%	1,3
% of enterprises using e-Government	77%	75,8%	68%	1,02
ICT spending as a percentage of GDP	2,9%	0,84%	2,7%	3,45
Sophistication rate of on-line public services	4,3	2	4,5	2,15

In comparison to the Estonian and the EU data, the data in Macedonia are mainly of the same order of magnitude, but two indicators suggest that this is the case only on the surface. The investment in ICT as a percentage of the GDP in Macedonia is about 30% of the EU average, and a degree of sophistication of the e-services in the Republic of Macedonia is 2 on a scale of 1 to 5, compared to the degree of sophistication of the e-services in Estonia, which is 4,3.

There is a visible discrepancy between the data in the last two rows and the rest of Table 4. The percentages of individuals and enterprises in Macedonia using e-Government are very close to the ones in Estonia, but the sophistication rate of the on-line services is more than twice higher in Estonia. The fact that almost 76% of the enterprises in Macedonia and 26% of the citizens use the services of e-government does not give a true picture, given the fact that the average of sophistication of the on-line public services in Macedonia is 2. Although there is no reliable data of the manner of using e-services we may assume that in the statistical surveys, probably every contact with the web pages of the government institutions on the Internet are registered as a sort of e-Government, even in the case of getting a telephone number or the address of an institution. At best, various types of forms are downloaded for applications and then the procedure continues in the traditional way, and this process is considered to be part of e-Government.

Another important issue with the ICT general statistical data provided by the State Statistical Office in the Republic of Macedonia is that the public administration is treated as a user, not a provider of ICT based services in the country. This is one of the reasons why statistical data appears to be better than the situation on the ground. Several services with their sophistication are closer to European levels, such as public procurement and corporate tax (Figure 3.), which offer fully enabled transactions on the Internet, but one must say that these are not mandatory, and a small number of subjects finish the process on-line. According to several authors, e-services have to gradually become mandatory, to encourage their wider usage. We might add this should be done carefully, while seriously considering the societal implications, particularly the impact that might be caused by the digital divide.

As for the budget allocated for the ICT development and projects, we must reiterate the position that there is no publicly available information about the amount of money spent on ICT projects in the public sector from the budget of the Republic of Macedonia through the years. Macedonia has no stable allocation of financial resources on ICT in its budget through years, and lacks transparency in this area.

The contribution of ICT in the governance of the public sector in both countries is on a different level, according to a number of e-Government models. According to Layne and Lee model (Layne and Lee 2001), Macedonia is placed in the first phase, Catalogue, with few breakthroughs to the second phase, Transaction, and Estonia is placed in mature third phase, Vertical integration.

In seeking the answer to the question where the differences in ICT application between two countries come from, we come to the education. In the comparative analysis of the education levels in two countries and the EU27 average, we found out significant discrepancy in the education of the labor force, as shown in Table 5. Estonia has about 3,5 times more population with tertiary education, more than twice students enrolled in science and technology educational institutions, and more than ten times science and technology graduates than Macedonia. There are recent significant changes in the educational policy in Macedonia. In 2007, secondary education in Macedonia became obligatory and about 85% of the students that finish high school enroll in the tertiary education institutions. The effects of this policy are expected to produce positive impact in long term, but it is too early to note positive trends in the statistics.

Table 5: Education indicators, Macedonia, Estonia and EU27 (European Commission 2010; Krull 2003; MASIT 2011; Invest in Macedonia 2008)

State / Criteria	Estonia	Macedonia	EU27	Rate Estonia/ Macedonia
% of labor force with tertiary education	35,3%	10%	26,9%	3,53
Tertiary science and technology enrollment as % of total tertiary enrollment	34%	15%	12%	2,26
Number of tertiary-level graduates in science and technology per 1 000 inhabitants	11,2	1	13	11,2

This indicator, the education, according to number of studies, is highly positively correlated to ICT literacy and ICT fluency, which are also expected to grow faster in Macedonia. In order to illustrate the lag in this area between the two countries, it is interesting to mention that the oldest and the largest University in the Republic of Macedonia has established for the first time the Faculty of Computer Science and Engineering in 2011. Until this year there were two ICT institutes operating as a part of other faculties.

Although higher education is not a part of the ICT field, we think the impact it has on ICT is significant and must be taken into account in the analysis of the application of ICT.

5. Conclusion

Although aware of the limitations of the empirical testing undertaken, the analysis conducted in this paper, gives us the right to point out several areas concerning the comparison of the application of ICT in the public sector in Macedonia and Estonia:

First, the policies and strategies in Macedonia and Estonia are on a similar, high level. Unlike the policies and strategies, the legal framework is not complete in Macedonia. Macedonia not only lags behind Estonia in making the ICT related laws ten years in average, but there is still a lack of a few essential laws regarding ICT.

Secondly, there is a solid organizational structure in Estonia responsible for ICT implementation, as not the case of Macedonia. The poor organizational structure could be one of the reasons why excellent policies are not implemented into good practices in Macedonia.

Thirdly, the degree of development of information society is much lower in Macedonia in comparison to Estonia, as shown throughout this analysis.

Fourthly, the investment in ICT in Macedonia is far below the investment in Estonia, and the European average. This indicator is perhaps the basis for understanding why Macedonia lags behind Estonia in the application of ICT.

And finally, there is a discrepancy in the sophistication of the e-services between two countries.

In addition to these five areas, our analysis of ICT application and ICT literacy led us to the comparison of the educational structure in both countries, and the data shows that Estonia has far more favorable educational structure than Macedonia, and that investment in education strongly fosters the development of ICT.

We are aware that we are far from a full explanation of the differences in the development of the two countries. But, we hope that we are closer to an understanding of the relationship between advanced applications of ICT and the economic growth in developing countries.

References

- Economist Intelligence Unit (2010) 'Digital economy rankings 2010', [Online], http://graphics.eiu.com/upload/EIU_Digital_economy_rankings_2010_final_web.pdf (accessed on 09/12/11).
- Economy Watch (2010), 'Economic Statistics' [Online], <http://www.economywatch.com/economic-statistics/> (accessed on 09/12/11).
- Estonian State information system (2006) 'Estonian Information Society Strategy 2013', [Online], <http://www.riso.ee/en/system/files/Estonian%20Information%20Society%20Strategy%202013.pdf> (accessed on 09/12/11).
- European Commission (2011) 'e-Government in Estonia', [Online], <http://www.epractice.eu/files/eGovernmentEstonia.pdf> (accessed on 09/12/11).
- European Commission (2010) 'Europe's Digital Competitiveness Report' [Online], http://ec.europa.eu/information_society/digital-agenda/documents/edcr.pdf (accessed on 09/12/11).
- European Commission, Directorate General for Information Society and Media (2007) 'The User Challenge - Benchmarking The Supply Of Online Public Services', [Online], http://ec.europa.eu/information_society/eeurope/i2010/docs/benchmarking/egov_benchmark_2007.pdf (accessed on 09/12/11).
- European Commission, Directorate General for Information Society and Media (2009) 'Smarter, Faster, Better eGovernment' [Online], http://ec.europa.eu/information_society/eeurope/i2010/docs/benchmarking/egov_benchmark_2009.pdf (accessed on 09/12/11).
- Eurostat (2009) 'Science, Technology and Innovation in Europe', [Online], http://epp.eurostat.ec.europa.eu/cache/ity_public/9-08092009-ap/en/9-08092009-ap-en.pdf (accessed on 09/12/11).
- Invest in Macedonia (2008) 'ICT Sector in Macedonia' [Online], http://investinmacedonia.com/files/recources_files/2468/ICT.pdf (accessed on 09/12/11).

- Krull, A. (2003) 'ICT Infrastructure and E-readiness Assessment Report: ESTONIA', [Online], <http://www.epractice.eu/files/eGovernmentEstonia.pdf> (accessed on 09/12/11).
- Kuppusamy, M., Raman, M. and Lee, G. (2009) 'Whose ICT investment matters to economic growth: private or public? The Malaysian perspective', *The Electronic Journal on Information Systems in Developing Countries*, No. 37, 7, pp.1-19.
- Layne, K. and Lee, J. (2001) 'Developing fully functional E-government: A four stage model', *Government Information Quarterly*, No. 18, pp.122-136.
- MASIT (2011) 'Macedonian IT market' [Online], <http://www.masit.org.mk/?Macedonian%20ICT%20market> (accessed on 09/12/11).
- Ministry of Economy of Republic of Macedonia (2009) 'Industrial Policy of the Republic of Macedonia' [Online], http://elektroluks.mk/index.php?option=com_docman&task=doc_view&gid=2772 (accessed on 12/02/12).
- Ministry of Education and Science of Republic of Macedonia (2011) [Online], <http://www.mon.gov.mk/mk/aktivnosti/824-2011-09-21-12-20-44> (accessed on 10/02/12).
- Ministry of Information Society and Administration of Republic of Macedonia (2010) [Online], http://www.mioa.gov.mk/files/pdf/dokumenti/Strategija_z_a_e-Vlada-05.03.2010.pdf (accessed on 09/02/12).
- Ministry of Information Society and Administration of Republic of Macedonia (2011) [Online], <http://www.mioa.gov.mk/?q=node/217> (accessed on 09/12/11).
- OECD (2011), 'Country statistical profile: Estonia', *Country statistical profiles: Key tables from OECD*. [Online], http://www.oecd-ilibrary.org/economics/country-statistical-profile-estonia_20752288-table-est (accessed on 10/02/12).
- Pohjola, M. (2002) 'Information Technology and Economic Growth: Introduction and Conclusions, Information Technology' in Pohjola, M.(ed.) *Productivity and Economic Growth: International Evidence and Implications for Economic Development*, Oxford: Oxford University Press.
- State Statistical Office of Republic of Macedonia (2011), [Online], <http://www.stat.gov.mk> (accessed on 09/12/11).
- Trading Economics (2011) 'Estonia unemployment rate', [Online], <http://www.tradingeconomics.com/estonia/unemployment-rate> (accessed on 09/12/11).
- Trading Economics (2011) 'Adjusted savings: Education expenditure (% of GNI) in Estonia', [Online], <http://www.tradingeconomics.com/estonia/adjusted-savings-education-expenditure-percent-of-gni-wb-data.html> (accessed on 10/02/12).
- Trading Economics (2011) 'Adjusted savings: Education expenditure (% of GNI) in Macedonia', [Online], <http://www.tradingeconomics.com/macedonia/adjusted-savings-education-expenditure-percent-of-gni-wb-data.html> (accessed on 10/02/12).
- The World Bank (2008) 'Research and development expenditure', [Online], <http://data.worldbank.org/indicator/gb.xpd.rsdv.gd.zs> (accessed on 09/12/11).
- W'O Okot-Uma, R. (2004), 'The Roadmap to eGovernance Implementation: Selected Perspectives', [Online], http://www.electronicgov.net/pubs/research_papers/guest/Roadmap2eGov.pdf (accessed on 09/12/11).

eGovernance and Freedom of Information Act: The Indian Experience

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Abstract: Freedom of Information is increasingly becoming an accepted part of democracy. This paper discusses the status of Freedom of Information (FOI) across a few countries and then examines the status of FOI in India. Around 90 countries have information acts in place and another 50 have legislation pending. The Indian Parliament had enacted the “Freedom of Information Act, 2002” in order to promote, transparency and accountability in administration which is referred to as Right to Information Act (RTI) in India. Since, FOI is becoming more and more acceptable; the thrust is on developing mechanisms for its implementation and in trying to measure its impact and effectiveness. There are divergent views on what should define the success of FOI and how its performance should be measured. Should the performance be based on only efficiency measures or should it include broader governance parameters on effectiveness. Zifcak and Snell developed a four-stage typology characterizing the life of an FOI regime. This paper measures the performance of RTI in India based on Zifcak and Snell framework and compares it with the FOI status in other countries. It also studies the global practices to assess FOI. Based on the Global trajectory and learning's on FOI, it tries to analyze the status of RTI in India.

Keywords: Freedom of Information (FOI), Right to Information (RTI) Act, eGovernance, performance, India

1. Background: Freedom of Information (FOI)

Freedom of Information is increasingly becoming an accepted part of democracy. Around 90 countries have information acts in place and another 50 have legislation pending (Vleugels, 2009). This signifies thrust towards openness and transparency across countries. Since, FOI is becoming more and more acceptable; the thrust is on developing mechanisms for its implementation and in trying to measure its impact and effectiveness. Many FOI laws are passed in response to domestic or international pressures for transparency and good governance for “symbolic purposes,” with little or no implementation machinery (Relly & Sabharwal, 2009).

2. Right to Information (RTI) Act in India

The Indian Parliament had enacted the “Freedom of Information Act, 2002” in order to promote, transparency and accountability in administration. The National Common Minimum Program of the Government envisaged that “Freedom of Information Act” will be made more “progressive, participatory and meaningful”, following which, decision was made to repeal the “Freedom of Information Act, 2002” and enact a new legislation in its place. Accordingly, “Right to Information Bill, 2004” (RTI) was passed by both the Houses of Parliament on May, 2005 which received the assent of the President on 15th June, 2005. “The Right to Information Act” was notified in the Gazette of India on 21st June, 2005. The “The Right to Information Act” became fully operational from 12th October, 2005. This law empowers Indian citizens to seek any accessible information from a Public Authority and makes the Government and its functionaries more accountable and responsible. The law applies to all States and Union Territories of India, except the State of Jammu and Kashmir - which is covered under a State-level law. The Act specifies that citizens have a right to request any information (as defined), obtain copies of documents, inspect documents, works and records, and take certified samples of materials of work. The Act states

“...democracy requires an informed citizenry and transparency of information which are vital to its functioning and also to contain corruption and to hold Governments and their instrumentalities accountable to the governed” – Source: RTI Act’ 2005

The RTI Act mandates the setting of the Information Commission at the state and the central level. The institutional mechanisms are now in place in most of the states and the Act has been operational for more than 5 years. There have many cases where the civil society organizations and the media have started using the Act for bringing in transparency and objectivity.

This paper starts with the genesis and background of RTI in India; it examines the status of the various RTI implementation mechanisms in terms of eGovernance technology and capacity building initiatives. It then studies the global practices to assess FOI and examine the status of FOI across

some countries. It then tries to examine the status of RTI in India and comment on the issues and challenges faced.

3. RTI implementation mechanisms

Many FOI laws are “paper” laws, passed in response to domestic or international pressures for transparency and good governance for “symbolic purposes,” with little or no implementation machinery (Relly & Sabharwal, 2009). Therefore, implementation mechanisms in terms of enabling technology and capacity building initiatives are important. Post the enactment of the Central Act, some State Governments have taken innovative initiatives in line with the spirit of the Act. Some of the initiatives are listed here:

- **RTI call center:** This is a convenient channel wherein the RTI application is taken by the call centre and payment of fee is included in the telephone bill.

Bihar was the first State in the country to create a RTI Call Centre – “Jankari”. Government of Bihar has initiated a six seater call centre. This call centre facilitates a caller in drafting the RTI application and the fee is collected through the phone bill. Requisite changes have been made in the rules for acceptance of the application through this channel. In Jankari, for filing the application under Right to Information Act, the applicant has to dial 155311 (even from a PCO) and he/she can seek information from the public information officer. Applicant has to provide his name and address for communication to file the request. He can also file the appeal on this number. In 2007 the total number of calls received was 6820 while this number went up to 15780 in 2008. The number has been increasing since which shows that this has been a sustainable initiative to promote RTI. An initiative similar to Jaankari has been started in the state of Haryana also. Similarly, RTI Helpline in Bangalore is providing RTI information to citizens (2002).

- **RTI Portal:** In this case, the information request can be made through the RTI portal. Various State Governments have already started planning the implementation of this recommendation. The RTI portal should contain links to all Ministry/Department websites of the appropriate Government. The RTI application is made online by choosing the relevant Public Authority on the website. The information seeker has the option of making the payment of fee through a payment gateway.

Central Information Commission has launched a website where the citizens can submit their complaints and second appeals online. The official portal designed, developed and hosted by National Informatics Centre (NIC) under the aegis of Department of Information Technology (DIT), facilitates citizens in filing complaints, appeals and in checking the status of appeal/complaints.

Orissa has developed a portal -RTI Central Monitoring Mechanism (CMM) (www.rti.orissa.gov.in) which was launched in 2009 and provides a single point access to information in conformity with the RTI Act, 2005 in a uniform manner at all the offices of Government of Orissa (figure). The portal enables proactive disclosures, receives applications online and disposes off requests in conformity with the Act. Further, it provides a scope to the Administrative Department to monitor the process of RTI implementation in respect of its subordinate Offices. More than 2000 offices are now connected to RTI CMM including 38 departments and 20 District Information & Public Relations Offices (DIPRO). Citizens are also asking information by using online RTI application form to all connected Public Authorities (Offices). The citizen can check his/her application status online by using his/her unique ID number given by the system. All these RTI applications are auto routed to the concerned Public Authorities (Offices) and status are maintained by respective Public Information Officer (PIO) through this System. On an average, more than 60 RTI applications have been received online to various Public Authorities (Offices) per month. Till May 2011, about 4500 RTI applications were received online from a total of 25,000 applications filed during the same period.

All the departments and subordinate offices are given with a user ID and password to manage their proactive disclosure information, RTI applications and appeals. However, the backend processes are not robust and the awareness in the respective departments needs to be built up to enhance the implementation of the Act. The state information commission also does not have any controlling mechanism on the department to ensure implementation. Therefore, at best this is an enabling mechanism and more needs to be done in terms of training, awareness building and accountability to enhance the usability of the portal.



Figure 1: RTI control monitoring mechanism Govt. of Orissa

- **Capacity Building Initiatives:**
- Government of India launched a programme in 2005 for “Capacity Building for Access to Information (CBAI)”. However, in 4 years, it could train only 0.1 million people across India.
- The Department of Personnel and Training (DoP&T), Ministry of Personnel, Public Grievances and Pensions, Government of India has started the ‘Online Certificate Course on RTI (OCC_RTII)’ to create awareness about the provisions of the Act (figure 2). This is an online 15 days certificate program open to all stakeholders. This programme has a better reach as it is online and has been able to provide training to about 10,000 stakeholders in 2009-2010.

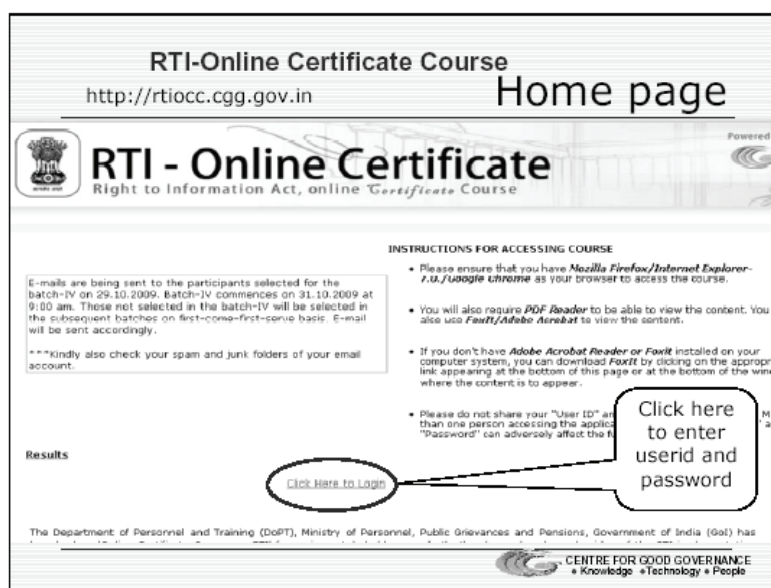


Figure 2: RTI online certificate course – home page

- “Train the Trainer” concept in Assam: Assam has adopted a “Train the Trainers” concept, where the Government trains the Community Based Organizations (CBOs) and Non-Governmental Organizations (NGOs) to impart training to citizens on RTI in order to maximize the reach of RTI and ensure that there is local ownership and sustainability. In this decentralized approach, active NGOs in each district are identified and training is imparted to them on “How to train citizens for RTI”. Then, these trained NGOs go to rural/remote areas to train the citizens on RTI and create mass awareness of RTI in the district. Moreover, Assam ATI has given some token money to all the 27 district deputy collectors, to be used to assist the NGOs in their awareness raising efforts.
- Review of Public Authorities by Andhra Pradesh State Information Commission

- *Public hearings at the district headquarters by Kerala State Information Commission*
- *The Central Information Commission website has a feature for online submission of complaints and second appeals.*

While the contribution made by the above implementation mechanisms has enhanced the awareness of RTI, there is still a long way to go to establish transparency and accountability through RTI. Common Service Centers (CSCs) is a scheme of the Government of India under which 2, 50,000 CSCs are being created. This means that there would be approximately 1 CSC for every 6 villages. These CSCs are expected to act as front-end/single window outlets for many Government services. These are being operated by private agencies under the Public Private Partnership model. These CSCs may be utilized to collect applications and facilitate citizens in filing RTI applications.

An assessment of RTI progress will help in the interventions required by various state/ central governments to improve its effectiveness. The implementation of RTI also depends on the political context and will. As Julnes and Holzer (2001) observe, such procedures “do not operate in a vacuum”; all reforms operate within a “political context that may weaken or bolster” the operation of the reform initiative.

4. How to assess FOI?

Since FOI is an international phenomenon, different organizations have begun to develop performance measures in an attempt to evaluate the effectiveness of the new laws. Some organizations such as the World Bank Institute (Relly & Sabharwal, 2009), have attempted to compile indicators on good governance such as transparency and accountability, access to information legislation etc. Simultaneously, Government departments also collect and publish statistics on FOI on their respective web-sites. There have been some studies which compare the FOI requests in different countries with the number of successful requests resulting in disclosure and the number of failed requests. However, this kind of data is hard to get on a cross-country level. Generally, such studies are restricted to country-level studies or department level studies with a view to give policy inputs and suggestions for reforms for the Act (White, 2007; RaaG/NCPRI, 2009).

Therefore, there are divergent views on what should define the success of FOI and how its performance should be measured. Should the performance be based on only efficiency measures such as number of requests, resources used, disclosures made, failure rate of requests, time taken etc or should it include broader governance parameters on effectiveness. Also, a comparison of FOI status across countries and learning's based on that would be useful. Broadly, the performance measures are seen to belong to one of the following categories:

- Efficiency parameters such as number of requests, resources used, Failure rate of the requests, High level of successful requests resulting in disclosure, Number of appeals undertaken, Time taken to process requests
- Quality indicators such as level of awareness and use
- Compile indicators for transparency and accountability like access to information legislation, telecommunications access, press freedom etc
- Cross-country comparative surveys

The performance measures collected and published by the governments are focused on: use of the Act and the volume of requests; the success and failure rate of requests; and performance of the appeal system. In no case do these provide absolute measures to assess FOI; at best, they offer a range of different proxy measures of good performance. A positive combination of the above factors, such as high levels of awareness and use, high rates of successful requests resulting in disclosure, and a strong appeals process potentially locks FOI into a positive cycle of use, learning, and improvement, in which the request process and appeal system improve and the exemptions are clarified through interpretation. Such a finding would be a sign of an Act performing well. Conversely, if FOI is not used or the appeal system is weak FOI may become locked into a negative cycle of disuse, neglect and stagnation (Hazell and Worthy, 2010)

The first indicator of a healthy FOI system may be the number of requests, though this may be dependent on who is making the requests and for what information. Heavy use by business or the media may produce a very different type of FOI regime than one driven by requests from the public. If

the Act is well publicized by government and the media, public awareness of the Act should be high, enabling a high rate of use.

Apart from the number of requests made, the performance of FOI also depends on the number of disclosures made. Here, the differences may arise because some countries such as Australia and Ireland allow access to personal files under FOI while countries such as Canada and UK enable access to personal files under a separate privacy or data protection legislation. This brings in a more fundamental question—should we include access to personal files under FOI? Australia initially included access to personal files within the FOI and then segregated it. India has followed a similar route. India has come up with a separate provision under the Data Protection Act in 2011 and personal information is not covered under RTI Act now. Canada has a separate privacy policy. In Australia, initially the number of FOI requests granted were as high as 75% as these were requests from individuals seeking access to their personal files (Hazell, 1987). But the numbers declined after access to personal information was taken out from the preview of FOI (Hazell and Worthy, 2010). While in most countries, the number of disclosures as a proportion of the number of appeals (disclosure rate) has increased over time, UK has shown a reverse trend. This may be due to the constraints in capacity as the number of requests increase. Another common problem seen is the delay in responding to the FOI requests beyond the statutory deadline in India, this deadline is 30 days; in UK it is 20 days. Different countries have different deadlines but to meet them, the capacity has to be created within the Government.

The Information Commissioner or appeal body can serve to rectify problems with the Act, establish precedents and provide guidance. An effective appeal body—one that polices the Act to ensure compliance and rectifies mistakes and promotes openness—is a key part of an Act performing well. This has proven to be the case in Australia, where the lack of a full champion and focal point for FOI contributed to the gradual deterioration of the Act's performance (ALRC, 1995). India has an Information Commission in every State headed by a state Chief Information Commissioner. But above all these structures, an effective FOI system requires strong Government commitment and political will.

Zifcak and Snell developed a four-stage typology characterizing the life of an FOI regime: *initial "optimism," increasing "pessimism," giving way to "revisionism" designed to alter the FOI law, normally to limit its scope or performance, and then later a return to the "fundamentals" of FOI* (Snell, 2001, p. 343). In each case, the performance of the FOI is influenced by the political environment of the country.

Here, we have tried to study and compare FOI across countries such as Australia, Canada, Ireland, New Zealand, Canada, Mexico and the UK. Australia, Canada and New Zealand passed Acts in 1982. Ireland passed an FOI Act in 1997 and UK passed it in 2000. Based on these learning's, we have tried to examine the status of FOI in India.

In Australia, the initial optimism and strong support gave way after 3 years to a series of revisions including an increase in fees which deterred requesters and after 5 years to gradual neglect of FOI by Governments (Terril, 1998). A review by the Australian Law Reform Commission (ALRC) highlighted problems of conflict, lack of co-operation, lack of FOI Champion. In 2008, a position of Information Commissioner was created to revive FOI and the scope of the Act was also enhanced.

In Ireland, explicit government support and positive assessment by the Information Commissioner were followed by similar pessimism and revision. After 5 years the government introduced the fees which led to a reduction in a number of requests. The introduction of application fees, charging 15 Euros per non-person request, cut the number of requests by almost 50% (McDonagh, 2006). The Information Commissioner describes acceptance of FOI as uneven with some public bodies reluctant and others suffering FOI fatigue due to resource constraints.

In New Zealand, the Act's success in early years was assisted by strong support of the Prime Minister. New Zealand revised in 1987—it increased the scope of the Act and limited the ministerial veto (to prevent release). These were positive revisions. However, this was followed by requests from media and opposition parties which caused friction and a lot of political dilemma (White, 2007).

In Canada, the Act was implemented with diligence though the public uptake was low. However, it was hampered by a negative reaction following a series of early controversies resulting from FOI requests, one involving the Prime Minister himself (Gillis, 1998). This led to revisionism due to a combination of resistance, decreased resources and informal systems designed to limit the impact of requests. This included a revision that the requests have to be made in person and in writing and cannot be made electronically.

In UK, FOI Act of 2000 came into force in 2005. The UK Act had a peculiar gestation. Pessimism set in early in UK-implementation was delayed until the latest possible date by statute. FOI laws can be launched with initial enthusiasm, but then undergo revisions to restrict the operation of the Act when politicians start to feel the pain, or simply suffer from bureaucratic neglect when starved of resources.

The implementation structures in Canada and Mexico are similar to the implementation structure envisaged in the RTI Act in India. Both these countries have mature implementation mechanisms. The Canadian Access to Information Law came into force in 1983. In Canada, emphasis is given to the record management practices at the Government Institutions and is under the Minister for causing the record management practices at the Government Institutions. Mexico was one of the first countries in Latin America to pass a "right to information" law, with the signing into law by President Fox of the Federal Transparency and Access to Public Government Information Law (RTI Law) in June 2002.

5. Studies to assess RTI in India

Society of Participatory Research in Asia (PRIA) did a study across eight states in India in 2007. The aim of the study was to assess the experiences of information seekers in accessing information under the RTI Act. Poorest Area Civil Society Programme (PACS) did a RTI campaign which was aimed to help poor people in 108 poorest districts of the country. PACS also tried to study the impact of use of RTI and to train and encourage as many people as possible on RTI. PricewaterHouseCoopers (PWC) did a study to understand the "Key Issues and Constraints" in implementing the RTI Act in 2009. Based on these studies, some of the issues and challenges in implementing RTI are discussed below.

6. Status of RTI in India: Issues and challenges

The experiences in India show that the issues in the implementation of RTI may pertain to the procedural aspects of the Government, capacity building and building implementation mechanisms for the Act. The number of RTI Appeals with the Information Commissions is growing at a rapid pace year after year. In Maharashtra, the numbers of appeals grew to 15,959 in 2007. However, there is a "wait period" of more than 12 months, thus discouraging citizens from filing appeals. On an average, the wait period across states is more than 3 months (PWC Report, 2009).

Table 1: Pendency level of second appeals at various states

	Appeals and complaints filed	Appeals and complaints disposed	Cumulative Pendency	% Pendency	Approx wait period
Maharashtra	11579	3611	13949	120%	14.4 months
Assam	189	189	0	0%	0 months
AP	2217	2217	804	36%	4.3
Orissa	2415	499	800	33%	3.9 months
Himachal Pradesh	306	306	0	0%	0 months
Uttarakhand	1349	1479	42	3%	0.3 months
Meghalaya	156	172	0	0%	0 months

Source: PriceWaterhouseCoopers (2009). Report on Understanding the "Key Issues and Constraints in implementing the RTI Act."

The awareness of RTI is increasing and so are the number of appeals. For instance, in Andhra Pradesh, the number of appeals from rural areas increased from 11% in 2006 to 43% in 2010. A total of 5867 appeals were received in RTI, Andhra Pradesh since Jan 2011. However, only 3,153 have been disposed off. This shows a disposal rate of only 54% and the pending cases are accumulating everyday. Building capacity will help the information seekers to learn how to use the Act more effectively. This will also help to reduce the gap between information providers and information seekers (PWC report, 2009). For India, the status of RTI may best be described between stage 2 and stage 3 of Zifcak and Snell framework. India had a slow start to the RTI Act. Increasing awareness of

the Act has enhanced the number of appeals. Since the number of unattended appeals across states is building up, there is a growing disillusionment and pessimism related to the Act. Initially, India covered the personal information under the RTI Act. Recently, it has come up with a revision. Now, India has a separate provision under the Data protection act in 2011 and personal information is not covered under RTI Act.

7. Conclusion and recommendations

This paper starts with the genesis and background of RTI in India; it examines the use of e-enabling implementation mechanisms. Specifically, it examines two e-RTI initiatives: Jaankari (a call center for RTI) in Bihar and a RTI portal (www.rti.orissa.gov.in) developed in Orissa for e-enabling the RTI processes. As part of implementation, proper capacity building initiatives and governance mechanisms are important. An effective appeal body—one that polices the Act to ensure compliance and rectifies mistakes and promotes openness—is a key part of an Act performing well. But above all these structures, an effective FOI system requires strong Government commitment and political will. FOI laws can be launched with initial enthusiasm, but then undergo revisions to restrict the operation of the Act when politicians start to feel the pain, or simply suffer from bureaucratic neglect when starved of resources. As the number of appeals is increasing, there is a need to strengthen the implementation mechanisms, target better record management practices which enable RTI compliance, build capacity and provide training. The RTI call centers set up in Bihar (Jaankari) and in Haryana have been a success. Similar initiatives may be planned across other states. Presently, the RTI call center and RTI portal initiatives are being planned in isolation. An integrated implementation mechanism should yield better results. Simultaneously, efforts should be made towards awareness generation, building a knowledge resource center on RTI Act, strengthening the record management system (paper/ e-office) and making it RTI friendly and conducting training.

References

- Australian Law Reform Commission [ALRC] (1995). *Open government: A review of the Federal Freedom of Information Act 1982*, ALRC 77. Canberra, Australia: Australian Government Publishing Services.
- Gillis, Robert P. (1998). Freedom of information and open government in Canada. In A. McDonald, & G. Terrill (Eds.), *open government* (pp. 143-167). London: Macmillan.
- Hazell, R. (1987). *Freedom of Information in Australia, Canada, and New Zealand*. London: Cabinet Office.
- Hazell, R. (1989). Freedom of Information in Australia, Canada, and New Zealand. *Public Administration*, 67(1), 189-210.
- Hazell, R. (1998). *Briefing from the Constitution Unit 19: commentary on the Freedom of Information white paper*. London: The Constitution Unit.
- Hazell, R. and Worthy, B. (2010). Assessing the performance of Freedom of Information, *Government Information Quarterly*, 27, 352-359.
- Julnes, P., and Holzer, M. (2001). Promoting the utilization of performance measures in public organizations: an empirical study of factors affecting adoption and implementation. *Public Administration Review*, 61(6), 693-708.
- McDonagh, M. (2006, June 8). *FOI: the Irish experience. Paper presented at the Conference on Access and Privacy at the University of Alberta*, Edmonton, Canada.
- PriceWaterhouseCoopers (2009). Report on *Understanding the "Key Issues and Constraints" in implementing the RTI Act*.
- Relly, J. E., & Sabharwal, M. (2009). Perceptions of transparency of government policy making: a cross-national study. *Government Information Quarterly*, 26(2), 148-157.
- RTI Assessment and Analysis Group (RaaG) and National Campaign for People's Right to Information (NCPRI) (2009). *Safeguarding the right to Information: Report of the People's RTI Assessment 2008 (Revised Report, Executive Summary)*. Retrieved July 18, 2011, from <http://rti-assessment.org/index.htm>.
- Snell, R. (2001). FOI: the experience of Australian states: an epiphany? *Federal Law Review*, 29, 343-358.
- Terrill, G. (1998). The Rise and Decline of FOI in Australia. In A. McDonald, & G. Terrill (Eds.), *Open Government* (pp. 89-117). London: Macmillan.
- Vleugels, R. (2009, September). *Overview of all 90 FOIA countries and territories*. Fringe Special.
- White, N. (2007). *Free and frank: making the official information act work better*. Wellington: IPS.

The Strategic Implementation of Data Interoperability for Better Health Care Services in Thailand

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Abstract: The Thai Government's primary mission in health care services is to provide better health care for all citizens with patient safety, quality of health care services and cost effectiveness. To achieve these goals, this paper proposes three key strategies: developing data standards enabling the seamless exchange of health information, developing the trust and willingness of data sharing, especially in multi-sectoral interoperability and enhancing data utilization for better operations, management and decision making, as well as for community empowerment. The implementation of strategies to overcome barriers in health care interoperability includes the creation of a blueprint for implementing data standardization and interoperability, channels for communication and collaboration among stakeholders at various levels, a best practices information-sharing platform, and a technology development roadmap for data utilization, as well as patient and community empowerment.

Keywords: data interoperability blueprint, best practices information-sharing platform, roadmap for data utilization, patient empowerment

1. Introduction

The Thai Government's primary mission in health care policy is to provide equity in health care services for all its citizens, with a focus on patient safety and cost effectiveness. In achieving these goals, one challenge Thailand has in common with other countries is the availability of data exchange among diverse information systems (PATH, 2012). The interoperability of existing health information systems could increase accessibility of important health information used in day-to-day operations, decision making, policy formulation as well as in emergency situations for saving lives. Moreover, the sharing of clinical information could keep healthcare costs under control by eliminating duplicate laboratory tests and other redundant operations, by maximizing resource utilization such as medical devices, medical doctors, drugs, etc. And most importantly, it could improve the overall quality of care.

Since 1995, the Ministry of Public Health (MoPH) has initiated various projects and specific health data standardizations in order to support individual records for hospital and primary care use. However, these coding standardizations were approached as ad hoc standards with the aim of reporting healthcare data in terms of payments, prevention and promotion. In addition, existing health information systems were designed independently of each other, and in general, were not designed to communicate with other systems. As stated in PATH 2012, not having a standard or common language complicates the exchange of information relating to patients, diagnoses, costs and other data needed to provide continuous care such as chronic disease monitoring, nor does it help to facilitate transactions such as patient referrals across various health sectors for patients covered by insurance. This poses serious challenges, resulting in inequitable treatment, inefficient use of resources and cost ineffectiveness. More recently, since 2011, MoPH and stakeholders have started to define minimum data core sets for implementing data interoperability between hospital information systems in five provinces of Thailand, in order to support patient referral systems and chronic disease monitoring. While NECTEC, or the National Electronics and Computer Technology Center, has supported such implementation with the ultimate goal of establishing a blueprint for implementation and extending it to cover the entire country by the end of 2013. However, the establishment of best practices on how to make health data interchange and integration using sustainable processes is still needed to ensure high quality data sharing, and how to accelerate interoperability across domains.

Generally, this challenge relies upon establishing a national strategic plan for health data sharing in the healthcare sector.

Since 2008, the Ministry of Information and Communication Technology (MICT) has developed Thailand's eGovernment Interoperability Framework or TH e-GIF (MICT, 2008) in order to provide general principles, guidelines, regulations and a set of technical standards for achieving this interoperability. However, practical implementation by government officials is still difficult. Accordingly, in 2012, MICT has plans to revise the roadmap and concretely define the practical steps for implementing eGovernment interoperability, including the healthcare sector. The time is ripe for both the healthcare and ICT sectors to align their common requirements for data interoperability and acquire best practices for extension to other domains.

In addition, we still face the following barriers in connecting heterogeneous health information systems for supporting better health care services and strategic implementation:

- Lack of trust and willingness to implement data for interoperability, lack of channels to communicate and share best practices of data standardization, lack of successful experiences to illustrate the benefits of data sharing, data exchange and integration in reducing administrative burdens and providing the promised productivity gains, low level of data quality in both hospital information systems and laboratory information systems.
- To overcome the challenges mentioned above, this paper therefore proposes implementation strategies for data interoperability as follows: a strategy for developing data standards enabling the seamless exchange of health information. Starting with bottom-up-requirements and using case studies and pilot project implementation, the best practices and lessons learned would be adopted as standardization process guidelines for setting strategic plans for nationwide implementation, and a strategy for developing organizational structure, processes and systems for data interoperability, especially in multi-sectoral models. With trust, awareness and efficient communication, a consensus of data standards would be accepted and adopted by all Thai health system stakeholders.
- A strategy for implementation of data interoperability through data usability. With scenario-based, top-down and bottom-up approaches, data utilization can be a crucial factor for getting doctors, medical technicians and health care providers involved in completing the data for hospital information systems.

The expected outcome of proactive strategic implementation, in the short term, is a blueprint of data standardization and interoperability implementation for successful data exchange. The blueprint will include guidelines for helping government officials navigate through the entire process of preparing high quality and effective strategic and business plans. Section 2 explains the current status and challenges of health data standards development. Section 3 is a brief of the strategic implementation progress to achieve the blueprint. Section 4 offers conclusions and discussion topics for the next step of implementation.

2. Current status and challenges

In order to improve the quality of health services, articulating a shared vision of building partnerships is necessary for disparate organizations to work together on common goals, all of which require fundamental shifts in working methods.

2.1 Organizational structuring for public health policies and development of health data standards

In 2007, the National Health Act was enacted in Thailand (National Health Commission Office, 2011b). The legislation served as an effective tool in setting guidelines for national health development initiatives, in which all parties in society have a hand. The National Health Act gave birth to the National Health Commission (NHC), chaired by the Prime Minister, in order to support the development of healthy public policies in cooperation with various sectors in society. The commission also provides helpful advice to the government and state agencies at both national and local levels to take the people's well-being into consideration.

In 2009, the National Healthcare Financing Development Committee (NHFDC) was established by decree of the Office of the Prime Minister in order to develop policies that establish optimization mechanisms for the country's healthcare system in terms of financing and insurance (Office of the

Prime Minister, 2010). These policies not only include a health financing model, but also a model for the development of integrated health care information systems and e-Health. The committee, chaired by the Prime Minister, is composed of Ministers from the Ministry of Finance, the Ministry of Labor and Social Welfare and the Ministry of Public Health; the Minister of Public Health serves as the deputy chair. The committee is also comprised of representatives from public and private agencies, including high level administrators from the ministries and the three national health insurance schemes: namely, the Universal Health Coverage Scheme (UCS), Civil Servant Medical Benefit Scheme (CSMBS) and the Social Security Scheme (SSS), (Phromporn et al., 2002). The committee's mission is to harmonize the three health insurance schemes and develop a financing model for providing an effective, equitable national healthcare system. The National Healthcare Financing Development Office (NHFDO) is the secretariat office of the NHFDC, and one of its immediate goals is to facilitate the development of a central mechanism for the health insurance reimbursement process, which can be used by all three health insurance schemes. Health data standards are one of the essential parts of the central mechanism. The NHFDO is now facilitating the development of national health data standards and national health insurance information systems.

In 2010, the cabinet approved the Strategic Plan for National Health Information Systems Development 2010-2019, proposed by the NHC (Health Information Systems Development Office, 2010). This is the strategic framework of the country's health information systems development initiative, consisting of five main strategies:

- To develop national health information standards.
- To develop integrated health information systems.
- To develop health information exchanges and manage health information systems.
- To develop a health information system supporting mechanism.
- To develop an effective information disseminating mechanism.

The prime minister, as the NHC chair, has appointed a National Health Information Committee (NHIC) to administrate implementation of the strategic plan (National Health Information Committee, 2010a). The NHIC has defined the four priorities of hospital information system development (Kijsanayotin et al., 2010) as follows:

- The development of national health information standards.
- The development of health information security.
- The development of new national health indicators.
- The development of community health information systems.

In order to implement the strategies and activities mentioned above, the National Health Data Standards Subcommittee was formed and appointed by the NHIC to collaborate with the Health Systems Research Institute (HSRI), the Ministry of Public Health (MoPH), the National Electronic and Computer Technology Center (NECTEC), academia, health care providers, software vendors and related hospital information system (HIS) stakeholders to find the gaps in national health data standards and select and implement consensus standards. Table1 summarizes the organizations and committees who contribute to the National Health Information Standards.

Table 1: Stakeholders in health data standards development

Stakeholders	Responsibilities	
National Health Commission (NHC)	Policy / Plan	- Develop healthcare public policies - Create a strategic plan for national health information system development
National Health Information Committee (NHIC)	Plan	- Administrate strategic plan implementation
National Health Information Standards Subcommittee (NHISSC)	Data standards	- Study and create a health data standards implementation plan
National Health Financing Development Office (NHFDO)	Data standards	- Facilitate the development of a central mechanism for the health insurance reimbursement process - Facilitate the development of health data standards and national health insurance information systems

Health System Research Institute (NHRI)	Data standards	- Collaborate with NHISSC in implementing a data standardization plan
Stakeholders	Responsibilities	
Ministry of Public Health (MoPH)	Policy / Strategy / Data standards / Implementation	- Develop health data standards - Promote and implement such standards
National Electronic and Computer Technology Center (NECTEC)	Data standards	- Develop tools and platform for data interoperability
Software Vendors	Data Interoperability	- Map existing data formats and elements from existing HIS to consent forms

2.2 Current status of data standardization in healthcare sectors

The development of data standards in the healthcare sector has been partially accomplished as shown in Table 2. The existing situation of strategic implementation of data interoperability is shown in Table 3.

Table 2: Current status of data standards development

Data Standard	Status (Non-existent, Incomplete, Complete)	Developed by	Source of Funds	Used by
Universal data core set	Non-existent (will be developed in 2012)	Kasetsart University	MICTeGovernment related Projects	
Healthcare data standards for health insurance reimbursement	Complete (in the process of being approved for announcement)	MoPH & NECTEC	NHSO & MoPH	Health insurance systems
Laboratory coding system	Complete (Implementing LOINC in Thailand)	Regenstrief Institute (HSRI implemented in Thailand)	HSRI & MoPH	Health insurance systems and clinical Information systems
National Drug code	Incomplete	NHSO, HSRI	NHSO, HSRI	Health insurance systems and clinical Information systems
Minimum data set for referral systems and chronic disease management	Incomplete	MoPH	MoPH	Public health information systems and clinical information systems
HL7 CDA	Non-existent in Thailand	HL7 International Organization N/A		Public health information systems and clinical information systems
SNOMED-CT	Non-existent in Thailand	IHTSDO N/A		Health insurance systems, public health information system and clinical Information systems
<i>Note: MoPH: Ministry of Public Health, MICT: Ministry of ICT, NHSO: National Health Security Office, HSRI: Health Systems Research Institute, SNOMED-CT: Systematized Nomenclature of Medicine -- Clinical Terms -- LOINC: Logical Observation Identifier Names and Codes, IHTSDO: International Health Terminology Standards Development Organization, HL7 CDA: Health Level 7 Clinical Document Architecture</i>				

Table 3: Current status of strategic implementation (adapted from the Federal Geographic Data Committee (2009))

Requirements	Status (Non-Existent / Partially in Place / Completely in Place)	Description
1. An organization designated as a coordinator with the authority to implement data interoperability strategic plans in the healthcare sector.	Partially in place	NHIC and NHISSC (National Health Information Standards Subcommittee) under NHC are established. However functions and authorities related to health information interoperability have
2. A clearly defined authority exists for	Partially in place	

Requirements	Status (Non-Existent / Partially in Place / Completely in Place)	Description
nationwide coordination of data interoperability and production of data standards.		not been clearly defined between MoPH and NHIC.
3. Politicians or executive decision-makers in MOPH are aware and involved in the process of data standard coordination.	Partially in place	The importance of health information standards awareness is increasing for some MoPH decision makers. However, awareness among the highest level executives and politicians is questionable.
4. Responsibilities for developing National Health Data Standards are assigned.	Partially in place	NHIC and NHISSC under NHC are established. However functions and authorities related to health information interoperability haven't been clearly defined between MoPH and NHIC.
5. Sustainable funding sources exist to meet project needs	Partially in place	Several government agencies and departments in MoPH provide funding support for interoperability projects, but sustainable funding has not been established.
6. Collaboration in funding resources and alignment of data interoperability projects	Partially in place	Several government agencies and departments in MoPH provide funding support for interoperability projects without alignment.
7. Support from top political officials in government	Non-existent	N/A
8. Policies and regulations relating to sharing health data and interoperability	Partially in place	NHIC and NHISSC under NHC are established. However functions and authorities related to health information interoperability have not been clearly defined between MoPH and NHIC. Recently, the Electronic Transaction Development Agency under MICT was established, and will be in charge of designating related regulations for e-Health implementation.
9. Requirements and cost estimation of health data interoperability projects	Partially in place	Requirements for health information standards have been proposed, but cost estimation has not been performed.
10. Communication among community of interests in healthcare sector	Partially in place	NHIC and NHISS are formal platforms for communication among health information systems stakeholders. Thai Health Information Network (THINK) is informal platform for communication among health information systems stakeholders.

Going beyond the current state of the art, several gaps due to policy, processes, people and systems are analyzed as follows.

Policy and organization:

- There is no explicit national policy on comprehensive health data standard development announced by any national official body,
- There are multiple players working on health data interoperability, but without alignment and resource-sharing,
- There is no governing body to take responsibility, accountability, or integrity for data standardization and auditing.

Processes and Procedures

- There is no systematic process or data standardization architecture to develop national health data standards with changing management.
- There are no guidelines with effective explanations for creating strategic plans. This includes certain activities, tasks and how strategic goals could be achieved by an organization.
- Inadequate communication channels for collaboration between stakeholders.
- There is no mechanism to promote and deploy the data standards.

People and Knowledge

- Lack of health information standard experts.
- Administrative and health professionals are not aware that healthcare service systems need many types of standards (semantics, syntactic standards, etc.) for the exchange of electronic information.
- Lack of education and training to raise stakeholder awareness of the importance of data standardization and data quality.
- Lack of best practices in data interoperability implementation.

Technology

- There are no tools for facilitating data collection, data entry, or data quality auditing.
- There is no common interoperability registry to access ad-hoc data standards.

Management Support

- Lack of sustainable funding.
- Low level of awareness among top executives and politicians.
- Lack of collaboration for sharing resources.

From the gap analyses mentioned above, the challenges are:

- How to develop national health data standards that can be used by all functions of healthcare service information systems.
- How to develop and facilitate the development of Thailand's health information standards in order to achieve health information system interoperability, with the ultimate goal of better health care provision.
- How partnerships and alliances can move the agenda forward in order to share resources and utilize the existing related framework.

The next section will give a brief of the existing framework called TH e-GIF, which are guidelines for eGovernment interoperability implementation.

2.3 Thailand eGovernment interoperability framework

Since 2008, MICT has developed Thailand's eGovernment Interoperability Framework (TH e-GIF) in order to provide general principles, guidelines, regulations and a set of technical standards for achieving national information system interoperability.

In 2010, in order to achieve the ultimate goal of being connected to both government and ASEAN, a 10 year roadmap has been established (Kawtrakul et al., 2011) for data standardization and interoperability, to be implemented nationwide.

Between 2009 and 2011, some prototypes for showing the benefits of data interoperability in the transportation and agriculture sectors have been developed. Actual implementation has shown that this has been effective in providing one-stop services for tracking drivers' licenses and providing faster payment services of promised compensation to flood-affected farmers.

Despite prototype development, the promotion of TH e-GIF, version 2.0, (Ministry of Information and Communication Technology, 2010) and Data Standardization Manual training (Ministry of Information

and Communication Technology, 2011), has demonstrated there is still no proactive implementation due to:

- No common understanding, no platform for collaborative efforts among government agencies and stakeholders. No continuous training or education for operational, management and executive personnel, such as models for exchanging data, data standardization processes and data quality management. No best practice platform for sharing experiences in order to realize the process of implementation. Insufficient resources, people and budget allocations to support project implementation.
- No trust or willingness to share data, especially in multi-sectoral interoperability.

The next section will give a summary of other research activities which could be aligned for accelerating health data interoperability implementation, with regard to supporting tools and technologies for health data utilization.

2.4 Smart health technology roadmap

Smart Health is one of the three flagships of ICT research development operated by NECTEC, Ministry of Science and Technology (National Electronics and Computer Technology Center, 2011). Smart Health has set the Technology Roadmap for applying ICT to the various health sectors, with the ultimate goal of giving people a better quality of life by smart living, offering better care services such as corrective care, proactive care and preventive care services. To reach this ultimate goal, the Smart Health Technology Road Map was initiated in 2008 with a 10-year time frame, including short, medium and long term projects that would lead to a nationwide improvement in the quality of health.

During the first 3-year phase, from 2009-2011, NECTEC focused on the development of data standardization to enable access to the agencies or software vendors involved. These standards cover the minimum standard metadata set, metadata brokering, metadata mapping tools, metadata conversion tools, data quality control processes, health information security systems, as well as information infrastructure design and improvement. The concerned parties all work together in terms of policy, service providers and users. Concurrently, two new projects, supported by MoPH and the National Health Security Office, and the Social Security Office and the Budget Bureau, have been initiated. By the end of 2012, seven provinces will be selected for implementation under these two projects, using a blueprint that provides an architecture for mapping a clear path from present conditions to a vision for a data interoperability plan. The blueprint also includes the processes and mechanisms to incorporate any changes to requirements in the future.

During the second 5-year phase, from 2011-2015, NECTEC will focus on the development of intelligent data collection devices, an expert system for risk management, collective intelligence based knowledge management and services, etc. The outcome of this phase will provide the technologies for health data utilization, which can be a crucial factor for getting doctors, medical technicians and health care providers involved in completing the necessary data for hospital information systems.

Although the 10-year Technology Roadmap would lead to a nationwide improvement in health and faster care services for a better quality of life in the future, under the concept of "Smart Health, Smart Living", the roadmap still needs Plan-Do-Check-Act, and needs to be aligned with the existing Master Plans of the main stakeholders, especially MoPH and MICT.

3. Strategic implementation progress

With the alignment of plans and activities mentioned in section 2, the inefficient use of resources and cost ineffectiveness could be overcome. In order to achieve the blueprint or strategic plan guidelines for proactive data standardization and interoperability implementation, the following activities will be aligned and implemented with key partnerships by the end of 2012, according to their priorities.

Data Standardization and Usability

- Developing a universal core data set based on TH-eGIF, which can be used across domains; e.g. between health domains and other selected domains such as disaster domains.
- Developing a prototype for a pilot project to demonstrate the benefits of data sharing, data exchange and integration in reducing administrative burdens and providing the promised productivity gains.

- Developing an evaluation matrix for a data interoperability platform, based on the two existing projects developed by NECTEC, in order to measure cost efficiency, effectiveness and data quality in three user categories: payments, referral systems and chronic disease management.

Channels of Communication

- Creating a best practices information-sharing platform for promoting the benefits of effectiveness and cost-efficiency of data standardization, harmonization and interoperability.
- Developing a collaboration portal for supporting project alignment and resource sharing.
- Establishing a call center with automated services to support data standards deployment, communities and co-creation.
- Strengthening the health information system workforce using knowledge management (KM) and continuous education:
- Leadership training for managing change.
- Health information management training for CIOs.
- Providing a combination of interoperability registries with processes and data management tools, including common repositories for data standards.

Data Interoperability Governance and Policy

- Responsibility and authority regarding health information interoperability activities need to be clearly defined for organizations such as MOPH and NHIC. The relevant activities include data standards development, requirement gathering and cost estimation of data interoperability projects, acquiring sources of funds, as well as creating policies and regulations supporting data interoperability.
- Raising the awareness of top executives and politicians about the benefits of data interoperability is essential for getting project support and sustainable funding.
- Policies and regulations relating to health data interoperability and sharing are needed to be formulated and implemented.
- Organizations responsible for data interoperability projects need to align resource funding and project objectives.
- Criteria for the successful management of change, such as rewards, encouragement, inspiration, and resource provision should be developed.

4. Discussion and conclusions

This paper does not propose an IT strategy per se, but strategies that do have IT implications, in an attempt to improve healthcare services by enabling the seamless exchange of health information. While TH e-GIF strategic implementation generally requires building services around the citizens through data interoperability, strategic implementation in the healthcare domain specifically requires improving services around patients. In order to make available and deliver the exchange of data among diverse hospital information systems, 'seamless' services across 'whole' systems need health data standards, which should be accepted and adopted by all Thai health system stakeholders and be compatible with international standards.

In order to achieve the goal of providing better quality health care for all citizens, with patient safety, quality health care services and cost effectiveness, a number of strategies have been set:

- The strategy for developing data standards proactively by aligning existing data interoperability projects in order to reduce the cost and time of each sector creating their own processes, plans and solutions, especially when communication across domains is needed. A pilot project is also required to acquire best practices of implementation and a blueprint. This would show the benefits of data sharing, data exchange and integration in reducing administrative burdens, and providing the promised productivity gains.
- The strategy for developing the trust and willingness of data sharing, especially in multi-sectoral interoperability, through multi-channel communications. Continuous promotion and awareness-building for motivating co-creation is needed, while establishing a call center with automated services to support data standard deployment and empowerment of communities.

- The strategy for enhancing data utilization with supporting tools, with clear data interoperability governance and policy. Government also needs to provide leverage to aggressively negotiate service-level agreements with strong financial penalties for non-compliance. Moreover, adequate time and effort should be spent for communication and collaboration with government officials at various levels, since resolving organizational and legal issues is a strong precondition for actual agreement on data exchange, integration, sharing and final adoption.

In order to be transformed into realistic implementation, several indicators are set for accelerating efforts:

- The number of multi-sectoral experts joining standard development teams
- The number of technical meetings conducted
- The number of stakeholders involved in development of standards
- The number of nationwide HIS projects that adopt data standards
- Establishment of the National Health Data Standards Maintenance Office

References

- Federal Geographic Data Committee (2009) Strategic Plan Guidelines, [Online], Available: http://www.fgdc.gov/policyandplanning/newspbp/StrategicPlanGuidelines_v2_052809_FinalVersion.pdf , [11 January 2012].
- Health Information Systems Development Office (2010) Strategic Plan for National Health Information Systems Development (2010-2019), [Online], Available: <http://www.hiso.or.th/hisosocial/think/think7.php>, [11 January 2012].
- HL7 Organization (n.d.) Health Level Seven International, [Online], Available: <http://www.hl7.org/>, [20 September 2011].
- Kawtrakul,A., Mulasastra I., Khampachua T. and Ruengittinun S.(2011) 'Moving Fast Forward to National Data Standardization', Proceedings of the 11th European Conference on eGovernment (ECEG11), Ljubljana, Slovenia, pp.643-654.
- Kijsanayotin,B, Kasitipradith, N. and S. Pannarunothai(2010) 'eHealth in Thailand: The current status', Studies in Health Technology and Informatics, Vol. 160, pp. 376-380.
- National Health Commission Office (2011a) National Health Commission Resolution, [Online] Available:http://www.nationalhealth.or.th/index.php?option=com_content&view=article&id=100&Itemid=116, [11 January 2012].
- National Health Commission Office (2011b) Thai National Health Act, [Online] Available: http://www.nationalhealth.or.th/index.php?option=com_content&view=article&id=87&Itemid=130, [11 January 2012].
- Phromporn, P., Sathāban, W. and Sāthāranasuk, R.(2002), Health insurance systems in Thailand. (in Thai), Nonthaburi, Thailand, Health Systems Research Institute.
- Regenstrief Institute (2010) Logical Observation Identifiers Names and Codes (LOINC®) — LOINC, [Online]. Available: <http://loinc.org/>. [30 December 2011].
- Office of the Prime Minister (2010) Government Gazette, [Online]. Available:http://www.ratchakitcha.soc.go.th/RKJ/announce/search_result.jsp?SID=CEA5869FCBB188CFF7EB83DC0672002E, [11 January 2012].
- Ministry of Information and Communication Technology, (2008) Thailand eGovernment Interoperability Framework, Revised version 1.1.
- Ministry of Information and Communication Technology (2010) Thailand Electronic Government Interoperability Framework version 2.0 (in Thai), [Online], Available:<http://egif.mict.go.th/>, [20 September 2011].
- Ministry of Information and Communication Technology (2011) Data Standardization for Government Interoperability Manual (in Thai), [Online], Available:<http://egif.mict.go.th/>, [20 September 2011].
- National Electronics and Computer Technology Center (2011) Flagship Projects(in Thai), [Online], Available:http://nectec.or.th/index.php?option=com_content&view=article&id=2221&Itemid=1071, [1 September 2011]
- PATH (2012), Determining Common Requirements for National Health Insurance Information Systems. Seattle.

ISAC6+ Delivering Smarter Administration Through Innovation - a Benefits Realisation Approach to Ensuring Success

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Abstract: The paper describes how the Project Management discipline of benefits realisation has been applied to an EU funded eGovernment initiative. It explores the benefits of using this approach, the challenges to be addressed, and suggest a framework for applying the approach to other local and national eGovernment initiatives. One of the key project objectives is to demonstrate through the pilot that implementation of the iSAC6+ system will provide value for money by delivering the desired benefits both to government office users and citizens. The approach described here focuses on costs and benefits generated by use of the system. There are staff costs for training, support and operation, technical costs for integrating iSAC6+ in to existing systems and websites, and more significantly organisational costs for designing and implementing new procedures and working practices. Citizens too will incur costs to access and use the service. In iSAC6+ we have created a model of costs and benefits which can be applied in the short term to the pilot, and in the longer term to a much larger number of public organisations. The aim of the Benefits Realisation model is to demonstrate that iSAC6+ is capable of delivering value for money, and thus to justify the investment needed for expanding its use. Information Technology project success or failure is traditionally judged against objectives set during initial project planning. Enterprises, both public and private sector, have found this approach inadequate because long term costs and benefits do not occur until after the project has completed. Benefits Realisation emerged in the 1990s and developed two roles: a discipline for anticipating and quantifying the expected value of a project in terms of the costs and benefits which will accrue after the project itself is complete; and an over-arching project management philosophy. The paper uses the case study experience to comment upon these two different perspectives. The model developed within the project is based upon the recognised public sector costing formula, the Standard Cost model (SCM) but goes much further by integrating it into a Benefits Realisation tool which creates an audit trail from organisational strategic aims through to detailed cost measures for both quantitative and qualitative incidences.

Keywords: eGovernment, benefits-realisation, SSM, citizen information services, it projects

1. Introduction

This paper describes how Benefits Realisation concepts and disciplines have been applied within a current, innovative eGovernment project to support achievement of strategic government objectives and deliver value for money. It is essentially a Case Study, not a research paper. While it does not contain a formal literature review, it does refer to relevant literary sources for purpose of illustration and explanation of key issues.

iSAC6+ is an EU funded initiative aimed at utilising semantic web technology to enhance the provision of advice to Citizens by government offices and public authorities at municipal and national government levels. The value added by iSAC6+ would be in improving the efficiency and effectiveness of Citizen Advisory Services, and in so doing help local government offices carry out their responsibilities for supporting the needs of citizens at risk of social exclusion or marginalisation. The project's key objectives are:

- To improve the efficiency and capacity of response of local Citizens Advice Services.
- To reduce time, money, stress, administrative burdens and other resources invested by both citizens and companies, especially SMEs, in trying to find information and filling their administrative needs with their local administration.
- To work towards a Single European Information Society for all, by installing a common on-line Citizens' Information and service access in a range of different scenarios and different SAC models across the European Union.

The project team comprised two academic institutions (University de Girona assisted by Sheffield Hallam University), a small number of specialist public and private sector organisations, and six partner public administration organisations who are piloting use of the service. Most partner

organisations were municipal governments but there was also one Police Force and a health related NGO.

The paper is broadly structured in three parts:

- Section 1 defines, describes and discusses the concepts, methodologies and practices found under the broad umbrella heading of Benefits Realisation. The discussion, based upon a review of key literature, explore the application Benefits Realisation to IT projects, looking particularly at how they are expected to support successful IT project outcomes. The review includes a discussion issues relating to the use of Benefits Realisation disciplines in public sector IT projects.
- Section 2 describes the case study methodology and how it has been influenced by concepts, practices and tools usually associated with commercial sector projects and organisational initiatives.
- Section describes how concepts, methodologies and techniques were applied to the iSAC6 case study.

The conclusion assesses our experience, makes observations, and makes observations on the applicability of the iSAC6+ approach to other public sector eGovernment initiatives.

2. Benefits realisation

2.1 Concept, methodology or technique

In this paper Benefits Realisation is referred to as a set of tools and disciplines rather than a specific methodological approach or procedure but it should be noted that within the world of project management theory and practice the meanings of “Benefits Realisation” are many and varied, ranging from general concepts to procedural toolkits. For example, Breese in a recent paper on the subject ably describes how “Benefits Realisation” has emerged over the last 20 years from being one way of focusing on Return on Investment in IT (ROI) to a position where Benefit Realisation Management (BRM) was seen as the over-arching programme management philosophy (Breese, 2011)

Ashurst, Doherty and Peppard describe research findings which indicate extensive enthusiasm by IS consultants and Business Analysts to claim adoption of Business Realisation as a methodology, while in practice applying it only in a limited or highly customised way. (Ashurst, et al., 2008).

2.2 Benefit and public value in eGovernment

In general, IT projects are characterized as complex in planning, executing and evaluating, multifaceted due to the variety and typology of intervening parties, often supposing an important volume of investment in terms of effort and financial resources, having the ultimate aim to bring benefits or create value for the implementing organizations.

Despite its relatively young history as a discipline, the field of eGovernment is a rich context for Information and Communication Technologies. Different definitions of the concept provided by relevant sources state that eGovernment is an effective means to create public value for citizens. Public organizations transform their existing services, introduce innovative ones, transform their internal processes, amplify and diversify their channels of service provision, overall improving their efficiency (Karunasena and Deng, 2011). These changes are often a direct result of a previous and premeditated decision on integrating technology in the public service. Information technology (IT), thus, is the underpinning driver of eGovernment.

In practice, EGovernment is not just about technology, but it requires change in the processes, attitude, and mind set of the government which is a big challenge (Nasim and Sushil, 2010). However and similarly to the business environment, public administration is pressured towards performance. By nature, its ultimate goal is creating value for the society. This issue is often questioned especially when a considerable input is deployed as it is the case of IT projects. Value definition and benefit realization become a must for the service provider, and satisfaction, trust and value perception are key issues for the user-side of the equation.

IT projects in eGovernment are a challenge for both researchers and practitioners. Interest towards the topic has recently accentuated especially in the research community. Specialized sources

considered a reference in the field (EGOV, ICEGOV, DGO conferences) and scientific publications (GIQ, TGPPP, IJEGR journals) are a proof in this direction. Although relatively recent in nature, there is a considerable body of knowledge generated around IT impact, performance, benefit realization/management and value generation in eGovernment often analysed and described in the framework of organizational change and management, system and institutional approach, the resource-based view. Since different management disciplines are applicable (change management, organizational management, benefit management, technology management, innovation management, project management) and there is a lack of consistent eGovernment modelling frameworks it is difficult to design and apply a “one size fits all” approach and method for benefit and value evaluation. That might be a possible explanation of the fact that empirical evidences in the field are often qualitative and case study research abounds. (Karunsena, et al., 2011)

The general view is that practitioners in the field of eGovernment managing IT projects for value generation have a difficult task. Ashurst, Doherty and Peppard reflect on the broadly held opinion that IT projects all too frequently fail either to deliver the expected benefits, or to demonstrate the value of their contribution to their owner organisations and go on to discuss the pressure to create clear value links between IT initiatives and the eventual outcomes of those initiatives. (Ashurst, et al., 2008)

Project management disciplines, including Benefits Realisation, are widely accepted as having been more successfully applied in the business environment than has been the case in the public sector (see for example (Stephen, et al., 2010) (Juell-Skielse & Perjons, n.d.). Furthermore, value and benefit are related to measurement and evaluation tasks. Service evaluation aspects have not been until recently on the top priority lists of public administration services since their monopolistic nature and political influence made it different from traditional services. However since the continuous call for business concepts application to the government sector as well as high interest for pay off aspects of technology this trend seems to be changing.

An additional item contributes to the topic's complexity. According to Viklund (2008) there is a lack of common definitions regarding benefits and value in existing literature and the meaning of the terms is assumed to be implicitly understood. This author uses Bannister's (2001) definition to show the difference: *value* is what we perceive, while *benefit* is what we receive. In other words, *benefits* can be thought of as an *operationalization of the value construct*.

Thorp (1998) stated “If you can't measure it, you can't manage it” meaning that measurement is the key organizations should deploy efforts in quantifying the *value for effort* binom even being a task recognized as difficult in nature. According to the same author several criteria should be taken into account when designing effective measurement systems. These are: make sure measures exist, measure the right things, measure things the right way and make sure measurement systems guide decisions and actions. Existing models offer a starting point. Still researchers and practitioners face a series of practical challenges when willing to apply them for concrete purposes in different contexts.

3. The case study methodology

1.1 Aims

As described earlier the core objectives for iSAC6+ are to deliver an innovative eGovernment support tool. The characteristics and context are illustrated in Figure 1.

The aim of this service is to reduce the administrative burden upon both citizens and government. Consequently there is a project objective to establish a mechanism for assessing the cost impact, in effect, a Benefits Realisation programme. To this end, one of the project Work Packages has the responsibility for establishing measurement and monitoring regimes for costs, benefits and quality of the service. The output from the workpackage was a model or instrument which will:

- identify expected costs and desired benefits
- place a measurable value on those costs and benefits
- monitor and assess the actual costs and benefits accruing during the life of the project
- provide project and organisation management with information about progress towards meeting strategic objectives.

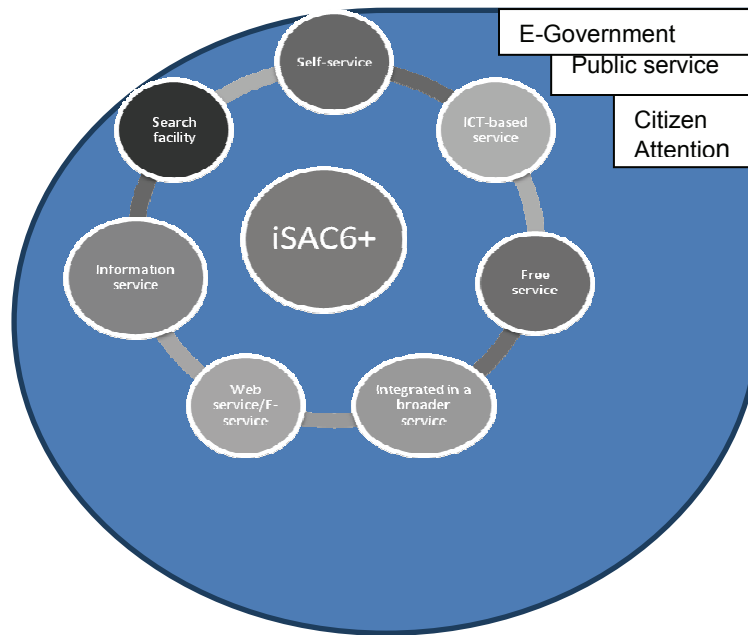


Figure 1: iSAC6+ characteristics and context

The task was to establish a Benefits Realisation mechanism capable of demonstrating that the iSAC6+ service was delivering real, quantifiable value to users and clients, that is, government offices and citizens using them. Traditionally the approach in public sector projects would have been to include some form of business justification in the original project proposal, possibly with quantified estimates in the form of an Investment Appraisal. Benefits Realisation, the process of monitoring actual costs and benefits with the aim of ensuring the project actually delivered value, would not have been included as a project activity. In this case it was, but only as an aim with no supporting methods or data collection models.

Responsibility for delivering the Business Realisation model lay primarily with a small team from the University of Girona (UdG) and Sheffield Hallam University (SHU). The role of this team was to work with representatives from each of the partner organisations. As a result the core team was able to utilise a range of high quality business management knowledge and skills.

1.2 Principles and methodology

The UdG/SHU team did not arrive with a clear understanding of the approach needed to achieve the desired results. While they started with a clear set of objectives, they had a blank sheet of paper as far as methodology and approach were concerned. In this situation it was important to establish a set of guiding principles together with a core methodological approach appropriate to the task, understood by all participants, and capable of re-use beyond the project including transference to other eGovernment initiatives. The core principle were:

- to use proven, recognised and complementary tools and approaches rather than attempt devising iSAC6 specific methods. The tools described below come from, or are derived from good administrative and business practice. It was in putting together the methodology that the team recognised the parallels with benefits realisation practice. That this was a benefits realisation programme was acknowledged rather than planned. This is very much in line with the findings of the previously mentioned research (Ashurst, et al., 2008) which observed a clear distinction between the comprehensive Business Realisation toolkit described in management theory and the ad hoc adaptation seen in real world practice;
- to build a model based upon an holistic view of the service, looking at the impact on all stakeholders and, as far as was practical, including all costs and benefits;
- to work within each partner's existing information and data collection procedures. This was partly to avoid creating new work, but also in acknowledgement of the fact that the value of using iSAC6+ should be evident in the wider organisational performance, not from measures specific to the project

The philosophy underpinning the choice of methodologies was systems theory, and in particular Soft Systems Methodology (SSM) which provided the approach and tools for developing a shared understanding of the project purpose and strategic aims. A good description of the various aspects of Systems Theory can be found in "Systems Thing, Systems Practice" by Peter Checkland in which he describes Soft System Theory as "a systems based methodology for tackling real world problems in which known-to-be-desirable ends cannot be taken as a given) (Checkland, 1993). The key elements of SSM are that it takes an holistic view of a real world situation, and this view takes into account the subjective perspectives of actors within the situation or system. Using an approach based upon SSM was particular valuable in the early stages of the work when there was both a lack of clarity and ambiguity about the purpose and objectives of the iSAC6+ service. With these principles in mind, the team decided upon developing an instrument with three core roles:

Value Measurement - a basic formula for deriving costs and benefits using the Standard Cost Model.
Strategic Performance Indicators – targets, performance information and core data a Base Data spreadsheet model.

Project Performance Monitors – a mechanism based upon the Balanced Scorecard using the same base data to monitor project progress towards delivering desired benefits.

3.1.1 The Standard Cost Model

The Standard Cost Model (SCM) was launched in March 2007 by the EU Commission as part of its Better Regulation Strategy. The purpose of the Standard Cost Model was, and continues to be, to provide a common cost assessment tool which would support the Action Programme objective which:

“aimed at measuring administrative costs, identifying and reducing administrative burdens, without undermining the underlying objective of the legislations” (Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Region, 2007)

The Standard Cost Model provides a standard formula which can be applied against any proposed policy change or legislation to assess the administrative cost or burden. The core formula as described in the Impact Assessment Guidelines (EU Commission, 2009) is:

Table 1: Standard Cost Model

Cost = P x Q where P (for Price) = Tariff x Time and Q (for Quantity) = Number of businesses x Frequency For the purposes of the iSAC6+ the formula has been stated as: Cost = Price x time x quantity

The primary objective of the standard cost model is to quantify costs in whatever form they take. In iSAC6 the proposal is to use the model in a more comprehensive way to assess the value of positive impacts as well as negative ones. In practice this means that the model will measure benefits as well as costs. The content and operation of the model is described below, but to summarise, it will enable project partners to identify where benefits accrue from using iSAC6, and to quantify those benefits alongside costs. The SCM was used throughout, appropriately adapted and developed to include a range of factors and measures which include qualitative and beneficial impacts as well as monetary costs. In this way it was hoped the resulting instrument would be capable of producing a balance sheet for the project, similar in concept to a Benefits Realisation appraisal See figure 3 below.

4. Applying the methodology

4.1 Approach

The diversity of the partner organisations meant that there was a multiplicity of business aims and objectives generating requirements for an equally diverse range of measurement and monitoring indicators. It was imperative to engage with partners in a way which would enable each to safeguard the aims and expectations of their respective organisations, while at the same time working together to develop a shared model and to identify common data needs. The choice of SSM as a consultancy discipline was made because it had a successful track record of being used in large, complex public sector environments (Wilson, 2001) (Checkland & Scholes, 1991).

The process consisted of three phases as illustrated in figure 2 below.

Phase 1 - establishing strategic objectives and drivers for each partner organisation

Phase 2 - identifying and defining data requirements

Phase 3 - mapping data on to an SCM based model

Workshop Process Data identification and collection

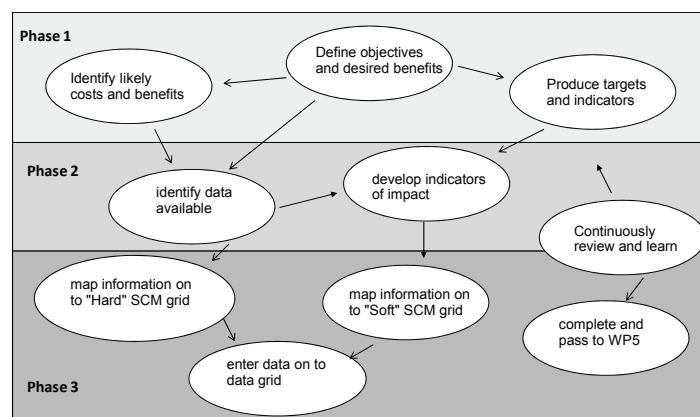


Figure 2: iSAC6+ Data identification process

It was of paramount importance that the core team engage fully with the partner practitioners, not only to ensure the accuracy and value of the end result, but also to enable us to fully utilise the skills and knowledge referred to earlier. The approach, in good management consultancy fashion, was workshop based, supplemented by face to face meetings. The practice was to present participants with a logical series on questions, the answers to which would deconstruct high level, strategic aims and expectations down to their base data components. The value of this approach was that it enabled partners to express their individual position, while leading them to a position where they could identify common data needs. Examples of the questions featuring in the workshops are:

Table 2: Phase 1 questions

Questions	Response
why did your organisation decide to participate in iSAC6?	Strategic Aim
what did they hope to achieve as a result: for citizens, organisations, administrations?	Strategic Objectives
what were the cost and benefit consequences of achieving these objectives?	Impact
how would they judge the success or failure of their organisation's participation?	Critical Success Factors
what information would be required to measure and monitor success or failure?	Indicators

Table 3: Phase 2 question

Questions	Response
what data was required to generate the information?	Data
what was the source of the required information?	Data source

Responses were structured into a model which effectively provided an audit trail from strategic aims through to the incidences where costs or benefits were accrued. The process for turning the information collected into quantified costs and benefits was as follows:

- identifying and describing processes with potential iSAC6+ interventions.
- recording SCM related data on costs and benefits for citizens and public services within these processes;
- describing "soft", qualitative costs and benefits Where possible partners suggested where indicative measures could be used to generate a quantitative value.

The result was the Baseline data model. The table below itemises and describes the individual components in their logical sequence.

Table 4: Phase 3 baseline data model

Title	Description	Data
Strategic Aim	Policy level expectations of benefits to be gained from iSAC6+	Text description e.g. Reduce staff costs
Strategic Objectives	Measurable outcomes supporting the strategic objective	Text description
Critical Success Factors	Achievement target for each Specific Objective	Quantitative (number, percentage, time etc)
Indicators	Indicators of performance against CSFs	Quantitative Indicator
Data	Primary data to construct indicators	Quantitative
Data source	Origin and nature of data e.g. survey, total population, actual, sample, estimate	Text

To make the model workable measures were structured and clustered in two ways. At the highest level the data is split into two sections to reflect the basic nature of the measures, quantitative and qualitative. Directly measurable costs comprised clearly defined capable of being represented in terms of quantifiable cost. Indirectly measurable costs, derived from qualitative objectives and indicators are difficult to cost in precise quantitative terms. They are nonetheless significant project outcomes which can be given a cost value through a process of analysis, research and estimation, in line with the European Commission Impact Assessment Guidelines (European Commission, 2009).

Data is then further sub-divided into three clusters each, namely Costs to Citizens, to Businesses and to Administrations.

The basic SCM formula is applied throughout the model, though it may be found to be difficult to apply it fully to some qualitative measures. Costs are straightforward, and benefits are shown as negative costs. This will enable the project to show a bottom line figure which reflects the true burden and benefit for the citizen of using iSAC6. The model, once populated, will be a working tool which will now be used for gathering data as Partners implement iSAC6 into their organisational processes. The intention was to monitor progress towards achieving benefits using a Balanced Scorecard. The Balanced Scorecard is an organisational analysis framework widely used to present an holistic view of performance and progress towards achieving core strategic objectives. In the event this was not possible because its design and use was dependent upon an understanding of strategic measures and data which did not yet exist.

Data collection grid (SCM & MSC models)

Cluster / Activity Area (4)	Strategic Outcomes (5)	Specific objectives (6)	Critical success factors (%) (7)	Indicators (8)	Information source (9)	Activity Standard Costs (10)	Price	Time	Quant	Final cost	Improvement rating %
Citizens (users) (1)											
Business (users) (1)											
Admin (provider) (2)											
Social impact (3)											

1. Impact on Citizens / business = Cost of burden to citizens / business
2. Internal impact = impact on the organization - Sustainability and efficiency
3. Social impact Identification is a goal in iSAC6+ . Measurements to be done qualitatively
4. Area of activity: citizen, Administration and Employees (that can be also include in Administration)
5. Strategic Outcomes = expected benefits - describes the benefits we expect for a set of actions
6. Specific objectives = result - describes any specific result we expect to reach by implementing iSAC in the specific sites
7. Critical success factors – criteria we want to achieve to meet strategic objectives (Expected improvement - %)
8. Indicators – describe one or more measurable indicators for each result
9. Source - where we gather information from
10. Activity Standard Costs – indicate the cost parameters for each outcome (cost per hour of employee, cost citizen's trip, ...)

Figure 3: Baseline data model spreadsheet

4.2 Issues and challenges

4.2.1 The Standard Cost Model

The SCM was developed to assess the potential cost impact of proposed new legislation and changes in policy requirements upon organisations and businesses, and to a lesser extent to citizens. From this point it has been further developed as a tool to assist in measuring the cost burden on citizens. It is essentially a quantitative tool. It does not easily accommodate qualitative impacts on less tangible aspects such as quality of life, satisfaction, or social cohesion.

There were also difficulties applying the SCM to positive factors such as service improvement or enhanced economic opportunity. The most recent addition to the Impact Assessment Guidelines provides guidance on assessing and measuring Social Impact, for example the impact on health or social cohesion. Essentially the guidance suggests ways in which impact can be "monetarised", but does not promote any single methodology.

Finally, the Standard Cost Model is primarily focused upon the impact of legislation and policy changes on business organisations. The impact upon individual citizens is included but the guidance is minimal, though increasing. The challenge for iSAC6+ was that the data collection model needed to indicate and measure costs on citizens in situations where costs may not have been clearly defined or even identified. Furthermore, the hoped for impact of iSAC6+ is that individual citizens and service providers are recipients of positive benefits rather than costs.

5. Observations and conclusions

5.1 Evaluation

In our view, one of the achievements of the present project is that it has **created awareness on the importance of monitoring and measuring**. Partners showed different degrees of involvement in the measurement process and different degrees of maturity and previous experience in general service monitoring. Although having managed previous IT projects none of the partners has a universal and/or unique project management method. Assessment and measurement issues often remain uncovered and do not have the same weight (in importance, dedication, time, etc.) as previous stages such as planning and execution.

Experts often call for the adaptation of general benefit measurement tools to specific circumstances. This process has obvious positive outcomes, but is not lacking difficulties especially when wanting to draw general conclusions.

Since IT is about transformation, time becomes a key player. Multi partner projects often lack of homogeneity in the different steps of the project they are facing. This is an additional feature that adds to the complexity of the measurement topic.

5.2 Successes and difficulties

The decision to adopt a broad philosophical basis on which to develop methods and approaches proved valuable. Most partners were unfamiliar with Soft Systems thinking but this proved not to be a problem. It was clearly the right choice for the situation in that it recognised the variety of contexts and perspectives present in the project, and in so doing provided an approach which enabled the team to develop shared solutions. This was important because finding a balance between individual and project objectives was difficult. There was a wide variance in the typology of partner, cultural context, initial service situation, objective of joining the project, to mention just a few. The choice of SSM generated two other areas of success as well as providing a useful set of consultancy tools. The first area was the focus on strategic aims which helped us avoid becoming immersed in the detail of the data model. The second was the participative, action research nature of the method which encouraged partner engagement and contribution of knowledge. The IT solution under analysis was not fully developed when the project started. Partners had difficulties in understanding the ultimate outcome of the project. However, the stress placed upon identifying and measuring benefits helped overcome uncertainty and confusion over what was expected from involvement in the project.

5.3 Concluding remarks

The failure to integrate the work on benefits measurement into the overall project management through a Balanced Scorecard raises fundamental questions about the choice and application of project management methods to publicly funded IT projects, bearing in mind the oft quoted high rate of failure to deliver expected benefits. Our approach to applying BRM was not in line with the classic methodology, reflecting the findings in the literature review. It has not been able to apply BRM as a Project Management discipline because of the nature of the project. This might indicate that BRM needs to be built in to the project structure from the beginning if it is to be used in this way. On the other hand it raises the question of whether Benefits Realisation is a management methodology or a less grandiose but equally useful measurement regime. Finally, it is our belief that the approach used in iSAC6 is suitable for, and transferable to other eGovernment initiatives especially when they exist in varied business processes where their primary purpose and desired benefits become obscured by the fog of complex implementation

References

- Ashurst, C., Doherty, N. F. & Peppard, J., 2008. Improving the impact of IT development projects: the benefits realization capability model. *European Journal of Information Systems*, Volume 17, p. 352–370.
- Breese, R., 2011. Benefits realisation management: Panacea or false dawn?. *International Journal of Project Management*, Volume doi:10.1016/.
- Checkland, P., 1993. *Systems Thinking, Systems Practice*. s.l.:Wiley.
- Checkland, P. & Scholes, J., 1991. *Soft Systems Methodology in Practice*. s.l.:Wiley.
- Chircu, A. M. & Lee, D. H. D., 2005. eGovernment: key success factors for value discovery and realisation. *Electronic Government*, 2(1).
- Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Region, 2007. *Action Programme for Reducing Administrative Burdens in the European Union*, s.l.: s.n.
- EU Commission, 2009. *Impact Assessment Guidelines*, s.l.: s.n.
- European Commission, 2009. *Guidance for assessing Social Impacts within the Commission Impact*, s.l.: European Commission.
- Guclu, A. N. & Bilgen, S., n.d. Process Based Public Value and Effectiveness of Government Information Systems.
- Juell-Skielse, G. & Perjons, E., n.d. New Challenges for e-Government: Value Realisation among independent actors.
- Karunsena, K., Singh, M. & Deng, H., 2011. Measuring the public value of eGovernment: a case study from Sri Lanka. *Transforming Government: People, Processes and Policy*, 5(1), pp. 81-99.
- Kezar, A., 2001. *Understanding and Facilitating organisational Change in the 21st Century*, Washington: Wiley.
- Mattheis, T., Loos, L., Schmidt, D. & Wimmer, M., 2009. Requirements Based evaluation of e-government. *International Journal of Electronic Government Research*, 5(3), pp. 47-61.
- Stephen, J. et al., 2010. *Fatal Error: fixing the flaws in government IT*, London: Institute for Government.
- Ward, J. & Daniel, E., 2006. *Benefits Management: Delivering Values from IT Investments*. s.l.:Wiley.
- Wilson, B., 2001. *Soft System Methodology: Conceptual Model Building and its Contribution*. s.l.:Wiley.

Tax Education: A Study of Civic Responsibility Among Irish Children

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Abstract: This project strives to test the adequacy of Ireland's education system in relation to tax. I chose to examine the subject CSPE, Civic, Social and Political education, which is a mandatory junior certificate subject, taught in Irish schools. It is the only mandatory subject in Irish schools that addresses how our country works. Is it enough? Given the economic situation in which Ireland finds itself at present, it is time to get back to basics. Children should learn as early as possible how a country works: how it pays for itself and its people. They should not first hear about tax when they receive their first payslip; they should not grow up with a feeling of entitlement to social welfare, but with a desire to contribute to the economy and power to be a part of the democratic state. In order to evaluate Ireland's education system in relation to tax and the economy, I compiled a survey questionnaire to present to secondary school children. The survey's first 6 questions related to the demographics of the respondents. Questions 7 to 13 queried the respondent's attitudes towards working and tax, social welfare benefits, reporting those who were abusing the system, uses of tax revenue and whether paying tax was necessary in our State. The results overall showed a very good understanding of tax. As was expected, the responses grew more favourable as the respondents progressed through the school years, thus showing that with education, comes a better understanding of tax. Females answered more favourably than males in this study. 100% of females surveyed responded that "tax is necessary in our State" compared to 84% of males. There has long been a sense of little or no civic responsibility in Irish people, together with a strong sense of faith for the Catholic Church. However, the youth of today are being brought up in an increasingly secular society with more openness and transparency to what is going on politically. Secularisation can only improve the civic education of Irish children. Results of this study demonstrate that the youth of Ireland are civically responsible; they recognise the importance of everyone paying their fair share and the resultant impact for a democratic society. Does this mean that Ireland is becoming more civically responsible? Well, all one can do is hope. One recommendation that developed from carrying out this project was that a website, similar to one launched by HMRC, be created by Revenue in conjunction with other Government departments. "Tax Matters" is an interactive website aimed at young people between the ages 11 and 19. The website helps users learn about tax and public spending; there is also a teacher's area which enables the website to be used in conjunction with the school syllabus. I think this would be extremely beneficial for students and teachers alike and it would also extend Revenue's communication channels with its future customers.

Keywords: tax education, civic responsibility, CSPE

1. Introduction

This paper seeks to examine the level of understanding Irish children have of tax in a welfare state. I wanted to establish if the future taxpayers of our society have an awareness of how the country's tax take has a significant impact on how the welfare state is shaped and if there is a lack of civic responsibility among them at an early and influencing stage in their lives. The successful teaching of citizenship in our schools could transform the lives of Irish children and has the power to shape what direction Ireland takes in the future. Considering the current economic difficulties facing the Irish State, I believe it is useful to examine the perceived lack of civic responsibility in our society.

"We developed an overwhelming sense of entitlement believing that being Irish conferred a range of benefits on its citizens just for being citizens and asked for nothing in return"
(Tansey 2011)

I am sure that it is not the case that all Irish citizens feel this way but there are some "free riders" out there. The Department of Education cannot be the only party responsible for teaching Irish children good citizenship. Parents and peers have a part to play too. But there are other factors to take into account, such as social and cultural background.

"Taxes for Growth and Development" is a slogan used in Rwanda, where they are developing their tax system. The Rwandan Revenue Authority (RRA) was established in 1997 in the aftermath of the Genocide of 1994. Overcoming civil war has been the challenge and making citizens of Rwanda feel secure in a transparent and legitimate environment has been the key. The slogan they use to promote

the RRA explains tax from the foundation. The Rwandan people are very appreciative of their new tax system; it is an incentive to create an improved developed country.

“The establishment of the RRA marked the beginning of a remarkable process or organisational development, which has seen the transformation of the government’s capacity to manage revenue collection. In just six years, the RRA has become a performing and respected institution that has helped increase domestic revenue generation from 9.5% to 13% of GDP. This is in stark contrast to the situation prior to the creation of RRA” (Land, A. 2004, P.3)

The RRA holds an annual “National Taxpayers Day”, which celebrates the positive contribution that taxpayers make. The Rwandan President attends the celebration, presenting awards for “the best taxpayers” and thanks the taxpayers for their contribution to the development of their country. The Rwandan governments target for tax collection 2010/2011 was Rwf458 billion, but the target was surpassed and they collected Rwf491 billion. The Commissioner General of RRA, Ben Kagarama noted at the 10th National Taxpayers Day that “Increase in tax collection is a testimony that citizens of Rwanda are willing to collaborate with the government to develop their country through the fruits of their labour”.

The Rwandan people are very appreciative of their new tax system and clearly gratitude is given from the government of Rwanda to its people, thus showing the equality in the social contract held between government and citizen. This equality in social contract has been somewhat lacking in Ireland. This project proves that there is sufficient education to equip Irish children with the knowledge of how a democratic society runs. This is all very good news, but where is the appreciation? Where is the social contract between Ireland’s government and its people? Relativity makes a developing country appreciative of improvement. Ireland, as a developed country, is likely to compare itself against other developed countries and against its own recent past, where an unfavourable comparison will always be made. This is why it is so important for Irish children to learn how the economy works from an early age.

The Republic of Macedonia Public Revenue Office (PRO) has initiated a similar project called “Tax Education of the Youth”. The project hopes to establish the preconditions for building a society of socially conscious and conscientious taxpayers. The project will be conducted in secondary schools across the country and future taxpayers will have an opportunity to get a clear picture and vision of what tax represents and what benefits society will receive from paying taxes. One similarity between both of these countries is that they have both suffered trauma and are trying continually to engage their citizens in a developing economy.

This raises the question of whose role it is to educate the youth: is it the Revenue Commissioner’s role or that of the Department of Education?

2. Literature review

This study focuses on whether compulsory education in Ireland properly equips students with the necessary civic responsibility to enable them to realise the importance of paying tax in a democratic welfare state.

Better educated taxpayers are supposed to know more about the tax law, but on the other hand, highly educated taxpayers may be less compliant because they better understand the opportunities for evasion and avoidance (Torgler 2007). The findings of a survey conducted by Vogel (1974) indicated that taxpayers with less education had less access to tax compliance information, were less informed about relevant tax regulations and needed assistance more often. There is some controversy around the issue of non-compliance and education.

There are several reasons for non-compliance. However, research clearly shows that financial incentive, as well as the risk of detection and punishment, is less important than the influence of social norms (Swedish Tax Agency 2005). Social norms can be socially learnt and biologically inherited, so what a person’s peers conceive of as acceptable can influence a person’s own moral values. Yet it is widely acknowledged that demographic variables, such as age, gender, marital status, education, culture and occupation have an effect upon fairness perceptions that ultimately impacts upon compliance.

Fitzgerald (2011) wrote that there has been a striking absence of a sense of civic responsibility throughout Irish society, a factor common to a range of recent Irish economic and financial failures. He suggested that the reason for this is that Ireland did not experience the modernisation in the 19th and 20th centuries that was common throughout the rest of northern Europe. In addition, Ireland's public administration and the owners of 95% of its land were all alien to the Irish people. He also suggests that because of this, and the fact that Ireland was a predominantly peasant society, it could not be expected that the alienated majority would develop the kind of strong civic sense that emerged in other parts of Europe.

A previous study by Kasipillai et al (2003) examining whether education influences tax avoidance and tax evasion found the prevalence of a relationship between education and tax compliance. The results of the survey suggested that there was some degree of improvement in tax compliance due to tax education. The results from the surveys revealed a significant difference among female attitudes in respect of general avoidance issues. The results suggest that education can remarkably influence the attitude of female students; they are also more aware of the legal implications of tax evasion and tax avoidance, compared to males. The study recommends that universities providing courses in social sciences as well as business, management and accounting should offer the preliminary taxation course as a core subject to all of their students.

However, in the US, Hite (1995) observed that the level of education was not linked to evasion or avoidance. In research carried out in the US and Hong Kong, Chan et al (2000) found that respondents' decisions to comply with their tax laws were mainly driven by their age and education. Other studies on the effect of education are conflicting; Wallschutzky (1993) indicated that education is the variable most likely to improve compliance, whereas Beron et al (1992) indicated that inconsistent results are produced as education is highly correlated with income level. Devos (2007) writes that the effect of education on taxpayer compliance is unclear. The reasons for these conflicting findings are varied. One reason is that there is difficulty in determining which aspect of education is being measured. Based on previous literature reviews, four measures of education have been identified: the general degree of fiscal knowledge, knowledge involving evasion opportunities, general educational attainment and specific tax knowledge.

Another study demonstrated the self-evident point that children's knowledge of economic phenomena increases with age as well as with their active engagement in the economy (Furnham 2005). The "Naïve Economics Project" designed by Leiser et al (1990) incorporated one question (out of 20) on tax. It was "What would happen if there were no taxes?" The results are not strictly comparable, as they used different aged children and reported their results quite differently, yet it is clear that even by the age of 14 children seem ignorant of and unsympathetic to, the concept of tax. It is evident from the study that knowledge increases with age, and it is also evident that, depending on where a person comes from, cultural background or religious beliefs will influence the children's knowledge of tax. So depending on the structure of the local economy or culture, children are more or less exposed both to taxes in the market place and to discussions about taxes that influence their understanding (Furnham 2005). Godfrey (1996) notes from an American perspective "Young children, and even school aged children, are not going to understand the concept of taxes at all. But they are going to hear about them – and almost always negatively." Godfrey even advocates taxing a school aged child's allowance. Most people will first encounter tax when they get paid for the first time, and it can come as quite a shock, so teaching children early on about the importance of tax is a very valuable exercise.

This study will focus on the effect of the compulsory subject Civic, Social and Political Education (CSPE), taught in Irish secondary schools.

CSPE is the only compulsory subject taught to Irish school children that addresses civics. The subject was introduced for the junior certificate cycle in 1996/1997. Prior to this, Civics was taught as a post primary school subject since 1966. As Ireland became more "European," a rapid decline of the Roman Catholic Church, together with the disaffection of young people from political and social institutions, a trend characteristic of developed, wealthy, secular societies, informed the preparation by the National Council for Curriculum and Assessment (NCCA) of the 1993 discussion document on CSPE. The movement towards revising citizenship education in the early 1990s was given greater dynamism by political commitment – the Labour Minister for Education placed citizenship (and sex) at the top of the agenda (Hammond and Looney 2000). The discussion paper proposed that CSPE be

included in assessment for certification purposes and that project work should be part of the assessment. The first students to sit the exam had already submitted projects that accounted for 60% of the total grade. The discussion paper, which drew on the work of James Lynch (1992), proposed the following rationale for CSPE:

“Civic, Social and Political Education prepares students for active participatory citizenship in local, national and international life. It should help students to use their minds well in a constantly changing and complex society. It should produce students who can explore, examine and analyse, who are skilled and practised in moral and critical appraisal and capable of making decisions and judgements through a clarified and reflective citizenship based on human rights and social responsibilities.” (NCCA, 1993, p.11)

The aim of CSPE is to make students aware of the importance of active participation of citizens in the life of the State and its citizens. Socially it aims to encourage students to be responsible individuals, family members, citizens, workers and consumers and valuable members of their own community within the democratic society. It aims to develop the autonomous potential of students, applying empathy in learning about and encountering other people and cultures, and to develop their critical thinking skills in agreement with a system of values based on human rights and responsibilities. After completion, students should have the ability and confidence to participate in a democratic society, having learnt about what a democratic society is, how it works and who the key players are. This should enable students to understand the importance of tax.

One inherent property of the subject is that it needs to constantly change to be delivered consistently. As world events occur, they need to be discussed; as Ireland progresses with Europe, it needs to be deliberated. Currently in Ireland the junior certificate curriculum is being reviewed.

3. Research methodology

It was imperative that the opinions of Irish children were obtained in order to assess the usefulness of the subject CSPE. The method chosen was a survey questionnaire to assess the views that Irish children have on various tax related issues. The participants were secondary school students in the Dublin area. Participants ranged from those who had just started studying CSPE (1st year students) to those who had completed the syllabus (4th, 5th & 6th year students). 150 surveys were distributed. 67 surveys were rejected as they did not contain parental consent. A total of 46 surveys were returned completed. 14 respondents were 1st year students, 3 respondents from 2nd and 3rd year and a total of 29 respondents from 4th, 5th and 6th year students. It was intended that an equal number of male and female subjects be surveyed in order to compare the difference between male and female views. 77% of respondents were male and 22% were female.

The initial part of the survey focuses on the respondent's demographics: school year, age, gender and religion. Another question was whether they have studied CSPE in order to compare those who have studied the subject with those who had not. In order to assess if there is a difference in views of those who have had a summer/part-time job, this question was also asked.

Questions 7 to 13 of the survey assessed respondents' views in relation to paying tax, social welfare and government spending.

Question 7 was an open-ended question to which the respondents had to choose from 4 possible conclusions; “We pay taxes to (1) pay those in Government, (2) pay for SW benefits, (3) maintain public services or (4) all of the above. 46% of 1st year respondents answered “all of the above”, while 86% of 4th, 5th and 6th year respondents gave this response. All 6th year respondents answered “all of the above”. 90% of female respondents answered “all of the above” compared to 69% of male respondents.

Question 8 asked if it is acceptable to work and not pay tax. 6 options were provided ranging from strongly agree to strongly disagree. None of the 1st year respondents strongly disagreed with this statement, 5 somewhat disagreed/disagreed, while 9 somewhat to strongly agreed. In comparison, respondents from 6th year generally disagreed with the statement while only 1 respondent somewhat agreed. 14% of males strongly agreed that it was acceptable to work and not pay tax, while females generally disagreed.

Question 9 asked if it is acceptable to claim social welfare benefits to which you are not entitled. Respondents answered in a similar pattern to question 8.

Question 13 asked respondents to state whether they agreed or disagreed with the statement “paying tax is necessary in our State”. 72% of 1st year respondents answered yes compared to 93% of 4th, 5th and 6th year respondents. 84% of males believe that paying tax is necessary compared to 100% of females.

There are of course certain variables, which will impact on the outcome of the survey. The current economic situation in Ireland will have an impact on the respondents’ views. Cultural background, social class and current difficulties facing some Irish families may affect their views. Certain lifestyle choices that parents of the respondents’ have chosen will impact on their views also. This study is focused solely on the adequacy of Ireland’s education system in relation to civics; therefore personal questions in relation to family background have been left out.

4. Discussion of the results

Firstly, the results of the survey show an adequate level of civic responsibility among Irish school children. Secondly, what is apparent is that knowledge grows with age, as the literature suggests. Furnham (2005) found that children’s knowledge of economic phenomena increases with age as well as active engagement in the economy.

The results also show a more responsible attitude from female respondents compared to male respondents. This was also found in the study conducted by Kasipillai et al (2003), where the results found that education can remarkably influence the attitude of female students and also indicated that female students were more aware of the legal implications of tax evasion and tax avoidance. Female respondents answered more favourably than male respondents to all questions in this survey.

Although this survey cannot make a direct comparison between educated students and their decisions regarding tax compliance, it gives a good indication that these students are showing signs of developing good ethical standards. The first students to be assessed in CSPE in 1996/1997 are now reaching the age of 30. Therefore, the majority of taxpayers in this country over the age of 30 will probably not have studied CSPE. A comparative study of taxpayers who have and have not studied CSPE would be interesting.

Further analysis of the survey results can be found in Appendix 1.

5. Implications for the Irish Revenue Commissioners (Revenue)

In the United Kingdom, HM Revenue & Customs (HMRC) has developed “Tax Matters,” a multimedia resource that aims to teach young people about tax. It stemmed from HMRC realising the importance of engaging with future taxpayers. Based on previous research, it was evident that young people entering, or about to enter, the workforce were ignorant about tax. Initially, it was seen as an unusual project for HMRC, as they were targeting people who were not yet HMRC customers. “Tax Matters” is a multimedia resource targeting secondary school children aged 11 to 19 years. There are three web-based interactive modules covering tax and society, income tax and national insurance. The modules use videos, quizzes and games and are used as part of the Personal Social Health and Economic (PSHE) lessons in secondary school. PSHE is a similar subject to CSPE in Ireland, covering citizenship, relationships and financial education. Research on the students’ experience of “Tax Matters” shows positive results, revealing that at least two thirds of the young people surveyed had learnt something new from visiting “Tax Matters.”

Revenue has made significant progress in recent years in relation to online communication with taxpayers with the launch of Revenue Online Service (ROS) for business and sole trader customers and PAYE Anytime service PAYE customers. Revenue has also interacted with schools and local groups in order to educate people and this process is on-going. Going a step further and creating a website similar to HMRC’s “Tax Matters” would be very beneficial. It is beneficial not only for the younger generation to learn about tax but also to people of any age group. The HMRC website helps users learn about tax and public spending, and there is a teachers’ area, therefore the website can be used in conjunction with the school syllabus.

6. Conclusion

Ireland's history has had a profound negative effect on the psychology on Irish people. I suggest that this is changing. From a country that has always had a strong sense of religious faith; we are now moving towards a society that is being less influenced by the church and more interested in the state of our economy. The results of the survey clearly show how responsible Ireland's youth are becoming. It has shown that the knowledge of the respondents has grown with education; therefore CSPE is a very good start to civic education. It is unclear what the future holds for our education system, with changes frequently being proposed. However, changes that would strengthen the core concepts of CSPE should be beneficial. It is a broad subject that covers a whole range of concepts. Although there are syllabus guidelines implemented for teaching CSPE, a more uniform approach could be taken by teachers.

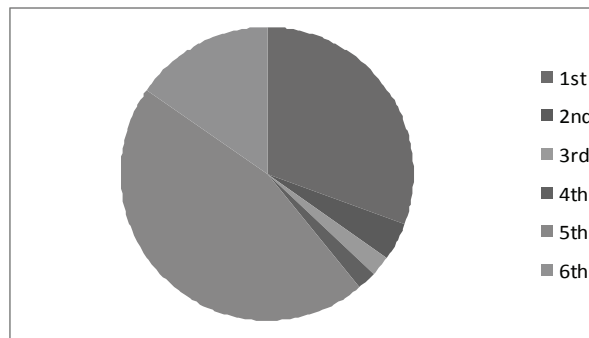
From the Revenue Commissioner's point of view, engaging with the future taxpayers of Ireland would be beneficial. In the world of social media, they need to connect with the future taxpayers in a more up to date way. There is a definite need for information to be more accessible to the public. An interactive website, aimed at school children and included in the CSPE syllabus should be considered.

"Taxes, after all, are dues that we pay for the privileges of membership in an organised society" (Franklin D. Roosevelt)

7. Appendix 1

Summary of survey results

Table 1: Summary of respondents' school year

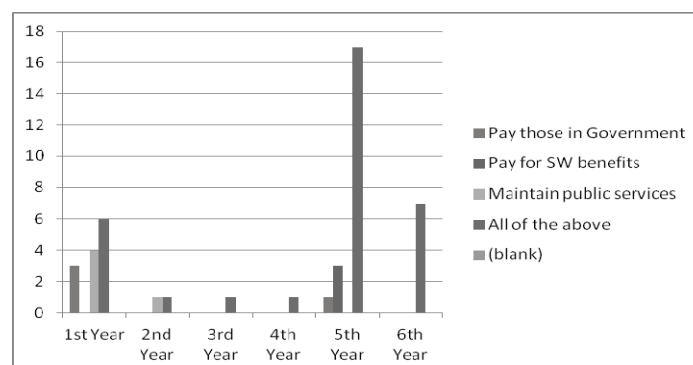


14 respondents were 1st year students (who had just begun studying CSPE), 3 respondents from 2nd and 3rd year and a total of 29 respondents from 4th, 5th and 6th year students (who had completed the syllabus).

Question 7

"We pay tax for". Overall, 72% of students answered "all of the above," which gives an indication that the respondents had a very good idea of what way tax revenue is spent.

Table 2: Summary of results for question 7 comparing 1st to 6th Years



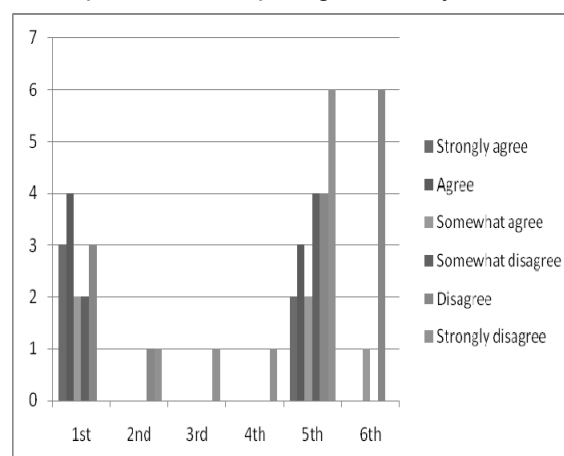
Of the respondents who have just commenced CSPE, i.e. 1st years, 46% answered “all of the above,” Of the respondents who have completed CSPE, 86% answered “all of the above,” All of the 6th years answered “all of the above.” This gives an indication that students, whether through age or education, are gaining more awareness as they move through the school syllabus.

Question 8

It is acceptable to work and not pay tax?

29 respondents answered on the upper part of the scale. This equated to 63% of respondents.

Table 3: Summary of results for question 8 comparing 1st to 6th years



The 1st year responses to this question are more evenly distributed along the answer scale, compared with the post CSPE students who answered at the more desirable end of the scale. Again, it is evident that as the students move through the school syllabus, they gain a more responsible opinion in relation to paying tax.

Question 9

It is acceptable to claim social welfare benefits to which you are not entitled?

This question measures how civically responsible the students are in relation to how tax revenue is spent. 35 of the 46 respondents answered on the upper part of the scale i.e. scoring 4, 5 or 6. This equates to 75% of respondents. 1st years' answers to this statement were again quite even along the scale. The post CSPE students again answered more favourably, with 65% answering with “strongly disagree”.

Question 10

It is acceptable to report someone who is not paying tax when they should be?

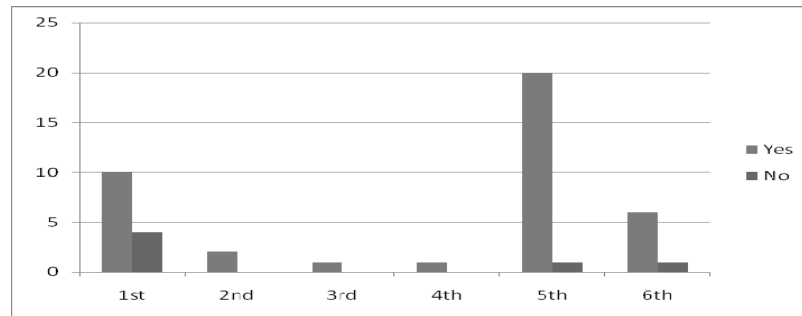
In a similar manner to question 9, this question seeks to measure how civically responsible the students are when it comes to everyone paying their fair share. 71% of 1st years answered in the lower part of the scale and 72% of post CSPE students answered in the same way. This is the first question to which both pre and post CSPE students have answered in a similar way.

Question 13

Paying tax is necessary in our State.

There were 2 possible answers to this statement, yes or no. 87% of respondents answered yes to this statement. 72% of 1st years answered yes compared to 93% of post CSPE students.

Table 4: Summary of results for question 13 comparing 1st to 6th years



References

- Braithwaite, V. and Ahmed, E., (2005) "A Threat to Tax Morale: The Case of Australian higher Education Policy," *Journal of Economic Psychology*, 26, 523 – 540.
- Devos, K. (2007) "Measuring and Analysing Deterrence in Taxpayer Compliance Research," *Journal of Australian Taxation*, 182 – 219.
- Devos, K. (2008) "Tax Evasion Behaviour and Demographic Factors: An Explanatory Study in Australia," *Revenue Law Journal*, Volume 18 (1).
- Fitzgerald, G. (2010) "Apocalypse may yet spark the rebirth of civic morality," *The Irish Times*, 16th October 2010, available at <http://www.irishtimes.com/newspaper/opinion/2010/1016/1224281251639.html> [accessed 12th January 2011].
- Fitzgerald, G. (2011) "Ireland's lack of civic responsibility grounded in our history," *The Irish Times*, 9th April 2011, available: <http://www.irishtimes.com/newspaper/opinion/2011/0409/1224294304351.html> [accessed 8th September 2011].
- Furnham, A. (2005) "Understanding the meaning of tax: Young People's knowledge of the Principles of Taxation," *The Journal of Socio-Economics*, 34, 703 – 713.
- Gillanders, N and Buckley, T. (2010) Taxation and Society", TT4077: *Social Administration and Tax*", 20th October 2010, University of Limerick, unpublished.
- Hammond, J. and Looney, A., eds (2000) *Education for Citizenship: Revisioning Citizenship Education: The Irish Experience* ed. London: Continuum.
- Kasipillai, J., Aripin, N. and Amran, N. A., (2003) "The Influence of Education on Tax Avoidance and Tax Evasion," *eJournal of Tax Research*, Volume 1, number (2).
- Kirchler, E. (2007) *The Economic Psychology of Tax Behaviour*, Cambridge: Cambridge University Press.
- Land, A. (2004) "Developing Capacity for tax administration: *The Rwanda Revenue Authority*," ECDPM Discussion Paper 57D, Maastricht; ECDPM 3-4.
- Lynch, K.J. (1992) *Education for Citizenship in a multi-Cultural Society*. London: Cassell.
- Lawton, D., Cairns, J., Gardner, R., eds (2000) *Education for Citizenship*, London: Continuum, 175-182.
- Loo, E. C., McKerchar, M. and Hansford, A., (2009) "Understanding the compliance behaviour of Malaysian individual taxpayers using a mixed method approach", Vol. 4 No.1.
- NCCA (1993) *Civil, Social and Political Education at Post-Primary Level*. Dublin: NCCA.
- Organisation for Economic Co-operation and Development (2008) *Governance, Taxation and Accountability: Issues and Practices*, Paris: OECD, 9-15.
- Organisation for Economic Co-operation and Development (2010) *Understanding and Influencing Taxpayer's Compliance Behaviour*, Paris: OECD.
- Peters, G. (1991) *The Politics of Taxation, A Comparative Perspective*, Oxford: Blackwell Publishing.
- Rwanda Revenue Authority (2011) "Self Reliance is the Objective". [online], available: http://www.rra.gov.rw/rra_article541.html.
- Reuters (2009) "Women better at money matters than men: survey". [online], available: <http://www.reuters.com/article/2009/03/01/us-money-women-idUSTRE52003C20090301>.
- RTE News (2011) *Radical proposals for Junior Certificate replacement* [online], available: <http://www.rte.ie/news/2011/0926/education.html> [accessed 26th September 2011].
- Smith, C. (2011) "Making Tax Matter to Teens," IOTA Website Newsletter [online] 9th May, available: <http://www.iota-tax.org/> [accessed 9th May 2011].
- Swedish Tax Agency (2005) *Right From the Start: Research and Strategies*, Solna: Swedish Tax Agency, 6-37.
- Swedish Tax Agency (2009) *Taxes in Sweden 2009: An English Summary of Tax Statistical Yearbook of Sweden*, Solna: Swedish Tax Agency.
- Tansey, D. (2011) "Irish Citizenship, or lack thereof, during the Celtic Tiger" *Washington Ireland Programme* [online], 14th July 2011, available: <http://www.wiprogram.org/WIPBlog.cfm?idBlog=29FF414C-944F-12A4-A3B8B664F7B572AC> [accessed 8th September 2011].
- Torgler, B. (2003) "Tax Morale and Institutions," Centre for Research in Economics, Management and the Arts, 09.
- Torgler, B. (2007) *Tax Compliance and Tax Morale, A Theoretical and Empirical Analysis*, Cheltenham: Edward Elgar Publishing Limited.

Evolving Substantive Notions of Representation: The SOWIT Deliberation Model

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Abstract: Recent deliberative innovations, such as citizen assemblies, have shown the potential for the evolution of political systems beyond preference aggregation mechanisms towards preference transformation processes among citizens. Their potential for increasing citizen trust and satisfaction in the representative system is reflected in the growing body of deliberative experiments worldwide. Yet, while such innovations show promise they face challenges of scale. Furthermore, most are episodic and with a direct effect on policy making in only a limited number of cases. Developments in the participative web have led to new opportunities for public engagement that offer the potential to scale up deliberations and overcome some of these limitations. However, the normative democratic design of an online deliberative forum remains a challenge with respect to issues of political and representative legitimacy. Important questions are 1) How can issues of scale be overcome to enable a full citizenry to be part of deliberative processes on policy issues; 2) How could meaningful output be achieved and; 3) On what basis can these deliberations be considered inclusive and representative? In this paper we address these questions by suggesting how an online deliberative forum *should* proceed based on innovations in normative democratic theory. To this end we present the design for an e-deliberation model that is integrated to local authority policy decision processes. The model, entitled SOWIT¹, implements John Dryzek's recent concepts of discursive representation and meta-consensus which supports a broader notion of representation particularly suited the cross-boundary political engagement of citizens online (Dryzek and Niemeyer, 2008; Dryzek, 2010). We argue how structuring deliberations using a discourse framework and meta-consensus procedures can address challenges of bias, group polarization and self-selection patterns which pose a challenge to the use of social media for legislative purposes. The contribution of this paper is providing the theoretical justification for a method in which inclusive citizen e-deliberations could be institutionalised into legislation processes.

Keywords: e-deliberation, semantic web, discursive representation, meta-consensus

1. Introduction

A cornerstone of the discourse of sustainable society is citizen participation, a principle repeated in the national strategies and development plans of European governments. In the past decade citizen consultation was viewed as enabling ownership and legitimacy of the political process hence supporting the effectiveness of policies targeting a sustainable future (Crozier, 2008; OECD, 2003). Today, in the context of the challenges of systemic crises and the opportunities for mass public engagement, this view has evolved to the recognition of citizens as key actors in producing collective intelligence to address complex social challenges. As a result, collaborative innovations are increasing, specifically with the aim of harnessing the collective knowledge, data and intelligence of many citizens towards social ends. New instances of such collective social engagement are emerging in the fields of citizen geo-tagging, tweeting for emergency services and climate warning processes.

However, deployments of social media in the political sphere have been less extensive. On the one hand, citizens express a general distrust of political players and institutions of democratic representation as evidenced in the findings of Eurobarometer 75. These show that public confidence in national institutions is low, 32% of citizens in the EU trust their Government and 33% their Parliament (Eurobarometer, 2011). New forms of online political engagement are emerging that cross traditional political boundaries on which the notion of constituency and democratic representation depend. Yet, some research has shown the potential in social media for transforming local political policy development. Bakker & de Vreese (2011), show how the use of certain types of new media is shown to increase political participation among the young. On the other hand, political actors and

¹ Social Web for Inclusive and Transparent Democracy

institutions generally are not knowledgeable on how to adapt representative institutions to such technology enabled developments in citizen behavior in a way that is inclusive and representative, thus leading to a low rate of innovation in this area.

In addressing this gap, a new literature is emerging on civic experiments designed to include large scale citizens in policy deliberations. Iandoli, Klein and Zollo (2007) outline a design for collaborative deliberation based on an argumentation approach. Miori and Russi (2011) demonstrate a model for integrating online and offline participatory budgeting in Municipio XI of Rome. Gordon and Manosevitch (2010) use the online virtual world *Second Life* to enable 'augmented' community deliberation on the planning of a park in Boston, Massachusetts.

Despite these advances, online citizen engagement in the deliberative processes required for sustainable policies and social cohesion face a number of challenges. The most critical of these is political legitimacy. Although online spaces provide a unique opportunity for integrating citizen deliberation to the policy process on an on-going basis, they also provide a unique set of opportunities and constraints for legitimacy that have not been sufficiently theorised in the context of normative democratic theory. Concerns have been expressed that the use of the internet for policy making can reinforce existing inequalities and the dominance of the technologically elite (Albrecht, 2006; Zhang 2010). Other concerns include the impact of virtual identities on participant sincerity (Dahlberg, 2001a). Authors also point to polarization and hemophilic behavioural patterns all of which mitigate opportunities for inclusive policy making as shown in the case of the Obama Briefing book.

The SOWIT (Social Web for Inclusive and Transparent Democracy) model addresses these questions by building on empirical findings on citizen deliberative policy behaviour and the theoretical innovations of Iris Young and John Dryzek's on the politics of difference (2000) and discourse representation respectively. We show how a new concept of discursive representation, supported by meta-consensus procedures can enable more inclusive and effective citizen participation. Meta-consensus processes for structuring deliberations can stimulate constructive policy engagement between strongly opposing groups as it does not necessitate agreement on outcomes (Dryzek & Niemeyer, 2007).

The paper is structured as follows. We begin in section two with a general overview of the theoretical framework of the SOWIT model. We then present the design for the e-deliberative forum in section three. In the fourth section we explain how the design can be considered representative and deal with challenges such as self-selection that currently pose an obstacle to e-enabled participation and deliberation. Finally, in section five we present the technological aspects under development and conclude with an outline of next steps.

2. Theoretical framework

In theorizing the challenges of citizen participation Young (2000) offers convincing arguments that current forms of citizen participation in policy making have limited effectiveness because: 1. The premise of consensus towards a 'common good' is flawed and; 2. An ideal deliberative environment does not exist but is defined by structural inequality and cultural difference. She proposes instead that as groups derive from relationally constituted structural differentiations, participation should be re-interpreted away from notions of the common good towards harnessing as a resource, differences in socially situated interests, proposals, claims and expressions. Inclusion, she argues, enables information spread across social groups leading to social knowledge of other positions, and prevents policy processes being dominated by certain groups to the exclusion of minorities thereby supporting the potential of sustainable policy outputs.

Extending this resource perspective on social difference, Dryzek argues that deliberative processes can be more inclusive where diverse social discourses are *explicitly* represented and where deliberative processes are structured according to a meta-consensus process. According to Dryzek's discourse is as 'a set of categories and concepts embodying specific assumptions, judgments, contentions, dispositions, and capabilities' (2008). Philips and Jorgensen broaden this understanding to "a particular way of talking about and understanding the world.." (2002). Inherent in our use of the concept of discourse is the principle that discourses are multiple, are expressed relative to specific issues and evolve and change over time. Discourse representation therefore involves representation of an array of discourses relevant to a specific policy issue at hand at a particular point in time. It differs from individual representation as each person subscribes to number of discourses which are

activated in different contexts. Through discursive representation, Dryzek argues that the issue of deliberative scale can be overcome to a global level (see Dryzek, 2010).

Dryzek's concept of meta-consensus is particularly suited to policy development in contexts of social diversity and lines of conflict, as it involves agreement on the domain of reasons and considerations pertaining to the issue at hand as well as the nature of the choices to be made. It does not require agreement on outcomes. Indeed, where non-common values constitute the deliberative process, "acceptable outcomes can still be reached by reframing consensus on epistemic, normative and empirical dimensions" (Niemeyer & Dryzek, 2008). Normative consensus describes the extent to which discourses and their values are recognized and accepted as legitimate in the process of the co-operative search for mutually acceptable solutions even where such value differences remain irreconcilable. Epistemic consensus refers to which facts and beliefs are accepted as credible and thus attention can be devoted to problem solving. Preference consensus refers to the degree of agreement on a) the dimensions along which choice can be structured or b) on the number of options available Dryzek (2010). Niemeyer & Dryzek have shown its effectiveness in structuring deliberation on health policy for the gay community in California among anti-gay groups and gay rights movements Niemeyer & Dryzek (2008).

A discourse based approach for scalable e-deliberation is particularly innovative because of its potential to democratise the wider public sphere thereby avoiding hegemony of particular discourses (van Dijk, 1993). Van Dijk argues that management of discourse access presents a 'crucial social dimension of dominance'. The current economic crisis highlights the benefit for a space for democratic and equal expression and deliberation of competing discourses.

3. SOWIT model

Adopting these perspectives, the SOWIT model aims to develop new understandings of citizen participation as a process of recursive citizen and representative deliberations, the content and structural composition of feed into decision-processes within local government. The SOWIT model enables inter-group communication, networking and deliberation by local government and citizens and comprises three spheres:

- *Public sphere* which enables open cross-group and local authority communications; a where issues are discussed, submissions are collaboratively created and where individuals are incentivized via a gaming mechanism to develop political skills and influence.
- *Dialogue sphere* where discourse advocates emerging from the public sphere deliberate on a proposal/policy draft in a way that is representative of social discourses.
- *Decision sphere* which represents local authority officials and elected representatives and where final policy is produced. The output of the decision sphere is measured against the citizens' deliberative draft. Where there are significant differences, the local authority is obliged to provide an explanation to the public sphere.

In this section we briefly outline the model's component before we turn attention to explaining how this scheme attends to the challenges of political legitimacy. For a full theoretical explanation of the model see (Liston, Harris and O'Toole, 2011).

3.1 Public sphere: Knowledge based social network

There are three primary objectives of the public sphere: First; it aims to enable broad inclusion of citizens in the policy development process, by creating a context in which discourses can be formed and articulated and the legitimacy of other discourses accepted - a necessary condition for deliberation (Habermas, 1984). Second: it enables cross-group social learning by providing a view of other discourses and citizen sentiment across time Third; the public sphere develops as a learning environment over time which informs the policy development process.

Within the public sphere discourses are identified using Q-methodology established by William Stephenson (1986) and which derives from his Concourse Theory of Communication. Q-method is based on analysis of social discourse structure in the concourse of communicability of every day conversation. Accordingly, to establish the range of discourses on a policy question, the SOWIT process requires identification of the widest range of possible statements on a policy issue. These are acquired through interviewing a purposive sample of citizens and are augmented by automatically retrieving relevant opinion statements from the web using data extraction technologies. The returned

statements are condensed and sorted by citizens. These Q-sorts are analysed using factor and correlation techniques to derive underlying social discourses. These are validated with citizens that load highly on those discourses (for a full discussion see Liston, Harris and O'Toole, 2011). A growing new literature is revisiting Q methodology for identifying public discourses related to a policy issue, clarifying stakeholder perspectives, resolving policy conflicts and find new solutions to challenging policy problems (Durning, 2005; Cuppen et al., 2010).

To promote the skills required for effective deliberation of these identified discourses, SOWIT deploys a game mechanic, by which members are incentivized to develop deliberative willingness and skills. These incentives, together with informal codes of community conduct, can be a powerful tool to address the challenges of political discussion forums as recent research has shown a significant effects of gaming on individual behaviour (Reeves and Read, 2009). Citizens can also self-register to act as a discourse speaker with evidence of deliberative willingness and Q-sort results publicized. Discourse speakers are endorsed by vote of their respective discourse subscribers.

3.2 Dialogue sphere and meta-consensus

The dialogue sphere is a feature that is enabled in addition to the public sphere when policy development is at stake or a political issue is open for consultation. It represents an informal chamber of discourse as conceptualised by Dryzek (2010). The aim of the dialogue sphere is to produce a deliberated proposal on an issue/policy that reflects the diverse discourses in the public sphere. This output is submitted to the policy development process. The citizens' draft is scored against the final policy output and where there is significant divergence the local authority explains divergences within the public sphere. The Dialogue Sphere proceeds only when all relevant discourses to the policy draft are identified and represented.

The challenge of the Dialogue Sphere is to reconcile thought diversity with movement towards a level of meta-consensus that can be brought to bear on the policy negotiations. Because discourses are strong compelling narratives, regular consensus processes are unsuited for the process of inclusive policy making as it can lead either to 1) discourse dissipation or 2) reinforcing irreconcilable conflicts among groups at a fundamental level. A wide literature points to further problems which include polarization, discourse dissipation, cascade effects of contributions, and the withholding of information that can occur during deliberation (Witschge, 2004; Landoli et. al., 2007). Approaching consensus by reframing its objective and disaggregating it into component parts (meta-consensus) can provide a mechanism for structuring deliberations and stimulating creative policy proposals.

Therefore, to support inter-group dialogue towards policy solutions that attend to the various concerns of the represented discourses, a meta-consensus deliberation structure is implemented in the dialogue sphere. Members' discussion stream is analysed and compared against other discussion streams for 'distance' along each of the three dimensions of meta-consensus. The distance between deliberating discourse pairs we term *discourse resonance* and the aim of deliberation is to reach as close a distance between all deliberating partners by scoring a *discourse resonance index*. This proposed measure is a dynamic comparison of real-time Q-sorts of the deliberation stream. It is used to describe the extent to which discourses resonate with each other along the three dimensions of meta-consensus set out above.

3.3 Policy development sphere

The policy development space is where policy is officially formed. Outputs from the public and dialogue sphere are provided to the local authority. Through engagement with the dialogue sphere, representatives are better informed, not only to the preferences in their constituency and beyond but also to the rationales for those discourses. Because of the visibility of the discourse spheres, this brings added accountability on the part of officials and representatives to ensure as far as possible that final policy output resonates with the discourses of the public sphere. The score of similarity with the citizens deliberated document acts as a direct measure of political system responsiveness. Figure 2 below illustrates how the SOWIT process integrates with current policy processes.

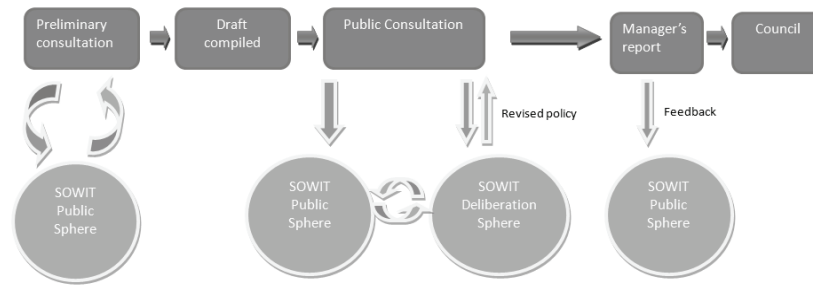


Figure 1: Integration of e-deliberation to policy development process at local government level

4. Challenges

Having described the model briefly we now turn to an explanation of how this approach can address those issues most relevant to enabling citizen e-deliberation on public policy.

4.1 Representation

4.1.1 On what basis can SOWIT e-deliberations be considered representative?

A core challenge facing online deliberative forums is the extent to which the output of deliberations can legitimately be regarded as representing citizens' views. Citizen assemblies, deliberative polls overcome this issue through random sampling of citizens (e.g. WetheCitizens Ireland; G1000, Belgium). The assumption is made that the observed population is representative of the entire population. Yet, pursuant deliberative processes have not isolated the extent to which such selected individuals represent the landscape of discourses that characterize competition and conflict within democracies. We argue that random sampling of individuals alone reproduces a specific conception of representation that does not account for the fact that citizens occupy multiple discourses which are activated in different contexts (e.g. feminism, environmentalism etc.). As Philips and Jørgensen (2002) state: "Changes in discourse are the means by which the social world are changed. Struggles at the discursive level take part in changing as well as reproducing the social reality". Indeed, analysis of the distribution and contestation of discourses within citizens deliberations is strikingly absent from relevant evaluations and publications. The SOWIT model attends to this gap by through its use of the Q-method. As Dryzek and Niemeyer's (2006) note discursive representation enables broad inclusion not only of citizens but of discourse subscribers that extend beyond geographical constituency boundaries, to include even non-human discourses.

A further important question is the legitimacy of the process by which discourse speakers emerge and are authorized to represent a discourse within the deliberation sphere. Saward (2009) offers an important argument for the authorization and authenticity of, what he terms, the non-elective *representative claim*. Saward's core argument is that representation is a process of claim making, a framework which enables a broader and more complex picture of the dynamics of the representation process. Accordingly, claims can be made beyond the electoral system, which have similar but distinct criteria for democratic legitimacy than electoral criteria. He suggests that such representative claims can claim legitimacy based on their connectedness, confirmation and untaintedness (see Saward, 2009). We argue that the act of representing discourses creates claims which fulfil these conditions. Specifically, the claims made by discourse speakers are *connected* to the policy making system; are *confirmed* through their emergence from the natural communication stream of everyday life and conversation; and are *untainted* through empirically determined fair deliberative engagement with all discourses including those that are under-represented in an electoral system orientated towards the median voter.

4.2 Self-selection

4.2.1 How can meaningful output be achieved?

Bias and self-selection in the composition and output of online forums (Albrecht, 2006) is a significant problem for a meaningful deliberation required for representation in legislative processes. The recent

Citizen's Briefing Book by the Obama administration demonstrated this issue when citizen recommendations for changes in public policies resulted in the legislation of marijuana as the first and third-most popular items with respect to health policy. The SOWIT model attends to self-selection issues by mandating the maximum diversity in social discourses relevant to a policy question, within the deliberation sphere. This diversity is supported by factor analysis of Q-statements to ensure that none are correlated. In this way, deliberations avoid over-representation of a particular discourse. In doing so Q-method provides a frame of reference by which online deliberation biases can be estimated and thus one way in which the issues related to exclusion and the digital divide can be addressed.

Furthermore, the unique approach of analyzing streams of communication for opinion statements opens new information on types of social discourses that are not captured by media or the electoral system. Procedurally, measuring the deliberative process in terms of preference and discursive transformation of these discourses provides information on the social dynamics and tensions as well as the potential areas of overlap and agreement between seemingly diametrically opposed groups (see Niemeyer, 2011). The establishment of a textual history of deliberations through the dynamic retrieval and sorting of statements in the deliberative communicability stream also provides a means of measuring the quality of deliberations for indicators of negative power effects and negative rhetorical methods that can subvert the deliberative goals.

5. Technologies snapshot

To enable these innovative concepts within an e-deliberative forum the SOWIT design harnesses emerging Web 2.0 and data analysis technologies to extract meaningful knowledge from the raw discourse data. While a full discussion of the relevant technologies is beyond the scope of this paper, this section presents a snapshot of the main technologies under development which are relevant to future development of the SOWIT e-deliberation model. It should be noted that SOWIT will be designed to support minimal computer-mediated implementations.

5.1 e-Public sphere

Because the public sphere is aimed towards large scale citizen engagement, and that contributions will be in the form of natural language, the resultant data model will be large and therefore challenging to interpret and manage. Developments in Natural Language Processing (NLP) are leading towards machine-learning and pattern-recognition techniques to extract machine-processable knowledge from human language. As such Named Entity Recognition (NER) can be applied to SOWIT specifically, the Gazetteer Approach to NER which performs entity matching based on preloaded entities indexes. The solution, which provides recognition of a fixed set of entities (Zamir and Oxley, 2011) is directly relevant to SOWIT where discourses relate to specific issues, e.g. transport, environment, employment. The Ontology-based Approach to NER performs entity matching based on ontologies which are based on common standards, and are flexible and universally identifiable. These technologies will be applied to extracting Q-statements from the web.

5.2 Dialogue sphere: Technologies in development

The meta-consensus deliberative process is likely to benefit from ongoing developments in argumentation technology. A wide literature is dedicated to argumentation and decision-making theory (Amgoud, Belabbes and Prade, 2005; Amgoud, Yannis and Moraitis, 2007), as well as tools and models for representing argumentation on the Web (COHERE²; Compendium³; Deliberatorium⁴). Schneider et al present a thorough review of argumentation for the Social Semantic Web, including the Issue Based Information System (IBIS), Dung's Argumentation Framework and Speech Act Theory. The EU FP7 funded IMPACT (2009) research Project is developing and integrating formal and computational models of policy and arguments about policy, to support deliberations about policy at a conceptual, language-independent level. However, such approaches, while essential developments have limitations for discursive representation due to their abstract orientation and their grounding in consensus and compromise processes (Caminada, Pigozzi and Podlaskowski, 2011). Such models of argumentation do not support inter-discourse deliberation approach orientated towards political co-operation as set out in the SOWIT model. In this respect Caminada and Wu,

² <http://cohere.open.ac.uk>

³ <http://www.compendiuminstitute.org>

⁴ <http://franc2.mit.edu/ci/>

(2011) have recently provided a robust critique of argumentation approaches and call for re-thinking of argumentation modelling to towards *reasons and claims*, which are immediately relevant to discourse structured deliberations.

6. Conclusion

In this paper we have approached the important question of how to incorporate online citizen deliberations as a legitimate component of legislation development processes. We have proposed a model for enabling e-deliberation that aims to achieve the normative goals of deliberative democracy by drawing on recent pioneering developments in the concepts of meta-consensus and discursive representation. Specifically, we set out the issue of the slow adoption of social media technologies for policy development processes due to concerns over bias, self-selection, polarization and other problems identified in online political discussions. We explain how a process of discursive representation and a structured deliberative schema can alleviate the likelihood of such behaviours and lead to meaningful output. We also outlined new scholarship on representation to which we refer with respect to the representative legitimacy of the deliberative output. Finally, we provided an outline of the emerging technologies and research approaches required to enable the concepts described.

Further research is required on a number of critical areas particularly, the effects of power dynamics and party politics. This area has not yet been explored within the experimental deliberative literature and suggests multiple paths of inquiry including strategic deliberative behaviour, incentives, and effects on system buoyancy and deliberative quality. Empirical research is also required on current indicators and frameworks for assessing such deliberative quality with respect to inclusion, process capture and/or manipulation in order to validate the model. Finally, those factors affecting the adoption of such an innovation (e.g. Susanto and Goodwin, 2010) among citizens, representatives and local authorities is an area that is a pre-requisite for both successful development and implementation.

Within the scope of this paper we have aimed to touch on the SOWIT's most salient features. While the model is grounded in the most recent innovations in democratic theory, we note that it provokes a range of questions which at the least demand experimental validation. We point to those experiments in which Q-method have been applied in research initiatives that aim towards uncovering discourse structure on particular policies issues or test deliberative dynamics (Durning, 2005; Cuppen et al, 2010; Niemeyer, 2011). We build on the findings of these scholars and take the first step to broaden and integrate these experiments as a legitimate deliberative link in electoral representation processes. As such the research program is its early stages. It is currently being developed in consultation with a local authority and its citizens in Ireland. It is our view that, given due attention to incentives and context, the deliberative and discourse resonance approach of this model can be relevant to contentious contexts for achieving decisive and sustainable deliberative outcomes.

References

- Albrecht, S. (2006) "Whose voice is heard in online deliberation? A study of participation and representation in political debates on the internet", *Information, Communication & Society*, Vol 9, pp 62-82.
- Amgoud, L., Belabbes, S. and Prade, H., (2005) "Towards a formal framework for the search of a consensus between autonomous agents", *Proceedings of the fourth international joint conference on Autonomous agents and Multiagent Systems*, ACM :New York
- Amgoud, L., Yannis, D. and Moraitis, P. (2007) "A unified and general framework for argumentation Based negotiation", *Proceedings of the 6th international joint conference on Autonomous agents and multiagent systems*, ACM :New York
- Bakker, T. P. and de Vreese, C.H. (2011) "Good News for the Future? Young People, Internet Use, and Political Participation", *Communication Research*, Vol 38, pp 451-470.
- Caminada, M., G. Pigozzi and M. Podlaskowski (2011), "Manipulation in group argument evaluation", *Proceedings of the Twenty Second International Joint Conference on Artificial Intelligence*, Catalonia, Spain
- Caminada, M. and Y. Wu (2011) "On the Limitations of Abstract Argumentation", *Proceedings of the 23rd Benelux Conference on Artificial Intelligence*, Gent, Belgium
- Crozier, M. (2008) "Listening, Learning, Steering: New Governance, Communication and Interactive Policy Formation", *Policy and Politics*, Vol 36, Issue 1, pp 3-19
- Cuppen, E., Breukers, S., Hisschemöller, M., Bergsma, E. (2010) "Q methodology to select participants for a stakeholder dialogue on energy options from biomass in the Netherlands", *Ecological Economics*, Vol 69, pp 579-591
- Dahlberg, L. (2001a) "Computer-Mediated Communication and the public sphere: a critical analysis", *Journal of Computer Mediated Communication*, Vol 7, pp 1-17.
- Dovi, S. (2007) *The Good Representative* Oxford: Blackwell Publishing.

- Dryzek, J. S. (2010) *Foundations and Frontiers of Deliberative Governance*, Oxford: Oxford University Press.
- Dryzek, J. S. and Niemeyer, S. J. (2006) Reconciling Pluralism and Consensus as Political Ideals. *American Journal of Political Science*, Vol 50, pp 634–649. (2008) “Discursive Representation”, *American Political Science Review*, Vol. 102, No. 4, pp 481–493
- Durning, D. (2005). “Using Q-Methodology to Resolve Conflicts and Find Solutions to Contentious Policy Issues”, Network of Asia-Pacific Schools and Institutes of Public Administration and Governance (NAPSIPAG) Annual Conference 2005, Beijing, PRC, 5-7 December
- Eurobarometer 75, (Spring 2011). *Public Opinion in the EU*, European Commission, DG Communication, Brussels
- Gordon, E. and Manosevitch, E. (2010) “Augmented deliberation: Merging physical and virtual interaction to engage communities in urban planning” *New Media and Society*, Vol 13, pp 75–95.
- Habermas, J. (1984) *Theory of Communicative Action*. Boston, MA: Beacon Press.
- Landoli, L., Klein, M. and Zollo, G. (2007) “Can We Exploit Collective Intelligence for Collaborative Deliberation? The Case of the Climate Change”, *MIT Sloan School Working Paper* No. 4675-08.
- Kriplean, T., Toomim, M., Morgan, J.T., Borning, A. and Ko, A.J. (2011). “Reflect: Supporting Active Listening and Grounding on the Web through Restatement”, *Proceedings of the Conference on Computer Supported Cooperative Work*, Hangzhou, China
- Liston, V., Harris, C. and O’Toole, M. (2011) “Computer-mediated deliberation for citizen self government: A theoretical design of an integrated policy process”, Paper prepared for the Political Studies Association of Ireland Annual Conference, 21-23 October, Dublin
- Miori, V and Russo, D. (2011) “Integrating Online and Traditional Involvement in Participatory Budgeting” *Electronic Journal of e-Government* Vol 9, Issue 1, pp 41 – 57, Available at: <http://www.ejeg.com>
- Niemeyer, S. (2011) 2011. The Emancipatory Effect of Deliberation: Empirical Lessons from Mini Publics, *Politics and Society*, Vol 39, No.1, pp 103–140
- OECD (2003) *Open government*, Paris: OECD.
- Philips, L. and Jørgensen, M.W. (2002) *Discourse Analysis as Theory and Method*, London: Sage Publications
- Reeves, B. and Read, J.L. (2009) *Total Engagement: Using Games and Virtual Worlds to Change the Way People Work and Businesses Compete*, Mass: Harvard Business Press
- Schneider, J., Groza, T. And Passant, A. (2011) “A Review of Argumentation for the Social Semantic Web”, *Semantic Web – Interoperability, Usability, Applicability* (Accept with major revisions)
- Susanto, T. D. and Goodwin, R. “(2010) “Factors Influencing Citizen Adoption of SMS Based e-Government Services”, *Electronic Journal of e-Government* Vol 8, Issue 1, pp 55 –71, Available at: <http://www.ejeg.com>
- Stephenson, W. (1986) Protoconcurus: The concourse theory of communication: I, *Operant Subjectivity* Vol. 9, No. 2, pp. 37–58.
- Witchsge, T. (2004) Online Deliberation: Possibilities of the Internet for Deliberative Democracy. In P.M. Shane, ed. *Democracy Online: The Prospects for Political Renewal Through the Internet*, New York: Routledge
- Van Dijk, T. (1993). Principles of Critical Discourse Analysis *Discourse and Society* Vol 4, Issue 2, pp 249-283
- Zamir, N., and Oxley, A. (2011). Building a Corpus-Derived Gazetteer for Named Entity Recognition, *Communications in Computer and Information Science*, Vol 180, Part 1, pp 73-80
- Zhang, W. (2010) Technical capital and participatory inequality in e-deliberation, *Information, Communication & Society*, Vol 13, pp 1019-1039

Social Media and Perspectives of Liquid Democracy: The Example of Political Communication in the Pirate Party in Germany

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Abstract: The recent success of the Pirate Party in the local elections in Berlin (8,9 percent) as well as their popularity in Germany on the national level (10 percent according to Forsa-polls in October) set a new round of discussion concerning the reforming of representative democracy in accordance with the new age of social media. This paper examines the reasons of success of the Pirates, in particular their strategies of political communication, and makes conclusions concerning the challenges and prospects of the idea of liquid democracy. Although among the Pirate-voters protest voting is widely spread, that doesn't explain the phenomenon of the marginal "Internet-party" gaining a nationwide popularity. Based on both theoretical and empirical research author claims that it is the new approach to political communication in democracy that makes the party so attractive. They managed to address social milieus which don't match with the traditional target groups division by age, profession etc. such as "modern performers" and "post-materialists" (Zolleis, Prokopf, Strauch 2010) as well as to meet the expectations of Internet-users, who are used to and who are willing to participate in politics. In their political communication 'pirates' use the social media tools which have been already explored and used in political campaigns all over the world, but unlike other parties they do it consequently and authentically (e.g. they manage themselves their social media presence that leads to even bigger overlap of private and public sphere in communication of voters and politicians). This paper examines how the concept of liquid democracy works within the party, showing that structure of the party itself resembles more of a network than a political institution, which obviously correlates with the trends of the 'network society' (Castells), but at the same time represents the main weakness of the liquid democracy concept: it is hardly possible to control the content of the network and therefore to use it as an ultimate instrument of decision making in politics. It could still be an effective tool for the civil society to set the political agenda and influence the framing of political discourse.

Keywords: social media, Germany, eParticipation, liquid democracy, pirate party, political communication

1. Introduction

The increasing role of the Internet in the political communication in 2000s gave hope that the democratic potential of the web Al Gore praised as early as 1994 would develop now very rapidly. Indeed, social media tools nowadays make the creation of the deliberative public sphere (Habermas 1989) more realistic than ever. This model presupposes communication in all directions: "one-to-many," "many-to-one," "many-to-many" and "one-to-one." However, in practice it turns out that political elites are in most cases not ready to use this opportunity for democratization of the political communication. For instance, the research conducted in at the Technical University of Ilmenau (Heimrich 2011) shows that German politicians rarely come to dialog with citizens via the Internet. Only 22% of them respond to online-massages of citizens in social media. Heimrich makes conclusion that

"unlike in the U.S., where social networks like Facebook are already established as an integral part of the communication strategy of many politicians, in Germany the use of Facebook in politics is still at the stage of beginning. Parliamentarians still very rarely use the key features of the social web (...)" (Heimrich 2011)

2. Social milieus of 'modern performers' and 'post-materialists' ready for fundamental changes in representative democracy

Meanwhile there exists already a considerable group of internet-oriented citizens who are used to and want to participate in decision-making with the help of the online-tools. This refers to a great extent to the so-called "Generation of Digital Natives" – young people who were born into the digital world (Hawkins, Schmidt 2008). The gap between the ossified political structures, still oriented to the traditional communication and decision-making patterns, and the new needs of the "network society" (Castells 2007, 2010) leads inevitably to social tensions, which we can observe now in different countries for example in form of the "Occupy" phenomenon. Since the early 2000s a declining trust in political elites has been the global trend which, according to Castells, leads to the "processes of counter-power linked to social movements and social mobilization" (Castells, 2007: 246).

The crisis of representative democracy challenges society to search for the new forms of political participation and organization. One of the possible answers to this challenge is the concept of “liquid democracy” represented by Pirate Parties in Europe. In this paper we examine the political communication of ‘pirates’ on the example of German Pirate Party, which is according to the results of the local elections as well as to the polls of the German Forsa-Institute is the most successful of existing Pirate Parties.

At the Federal elections in Germany in 2009, Pirate party, founded four years earlier, won 2 % of the vote, and in September 2011 they unexpectedly gained 8.9% of the vote in the local legislative elections in Berlin. In March 2012 ‘pirates’ managed to enter the local parliament of Saarland with 7,4 percent of votes, leaving behind two established parties such as “Alliance '90/The Greens” (5 %) and the Free Democratic Party (1,2 %). In October 2011, according to the poll of the Institute for Social Research “Forsa” 10% Germans said they would vote for the ‘pirates’, if the parliamentary elections took place on the respective Sunday. According to the survey ARD-TV conducted after the local legislative elections in Berlin, the portrait of the typical voter of Pirate party is rather contradictory (‘Piratenpartei klettert auf zehn Prozent’, 2011). Quite unexpectedly it was not only the twenty-year-old Facebook-hipsters who voted for the ‘pirates’, the survey showed a scale of all age groups. Thus, in the age group from 35 to 44, 10 % of Berliners voted for the ‘pirates’, in the group from 45 to 59 year old - 8 %, from 18 to 35 - 16 %. The only group, where ‘pirates’ were not so successful, was that of the people older than 60 years (3 %).

This success can be, of course, partly explained by the protest voting. According to the head of the “Forsa”-Institute Manfred Güllner, ‘pirates’ took over votes from the other parties, because citizens are unsatisfied with the current policy (‘Piratenpartei klettert auf zehn Prozent’, 2011). According to Güllner, the majority of these protest voters comes from the center-left of the political spectrum, but there are also people who traditionally support the libertarian Free Democrats and the conservative Christian Democratic Union. However, the nationwide popularity of this party and the growth of its membership by 40 percent in 2011 cannot be explained only with the protest voting. It is also the new approach to politics aimed at its democratization that attracts people.

‘It is true, that many voters and supporters of the Pirate Party spend a lot of their time online, communicating via social networks (...) and that there are interested in issues of Internet policy. But their discontent with the contemporary politics roots primarily in the feeling that the traditional parties are too far from their world. They require a new political culture. More participation, more democracy.’ (Gathmann, 2011)

A research carried out on request of the Hans-Seidel-Foundation shows that pirates appeal to the new target group that has been formed rather recently and can be considered as a product of the developed information society (Zolleis, Prokopf, Strauch, 2010). These are the so-called social milieus of ‘modern performers’ and ‘post-materialists’ according to classification of Sinus-Institute in Germany. (‘Sinus milieus’, 2011) The first group is well-educated people, internet-oriented, under 30, with large number of students and self-employed entrepreneurs among them, who understand themselves as “non-conventional, technological and cultural elite”. The second group, “post-materialists”, represents creative industry; they are intellectuals, for whom freedom is more important than security and who fight against ossified bureaucratic structures. These people, Internet-oriented and therefore rather influential in the digital public sphere, until now didn’t feel themselves represented by any political party. This fact inter alia explains on one hand their low participation in traditional democratic procedures such as elections and on the other hand their claims for more direct democracy and their engagement in the anti-elite movements such as “Occupy”.

3. New type of political party challenges the traditional political spectrum

Since the foundation of the Pirate party in 2006 experts have been trying in vain to determine its position on the political spectrum: this party does not seem to fit into the traditional ‘left-right’ framework (Hofmann, 2011). The analysis of the profiles of the party leaders shows that they have strikingly different background. For instance, the chairman of the party Sebastian Nerz was formerly a member of the conservative Christian Democratic Party; a deputy of the Berlin Parliament changed to the ‘Pirates’ from the Green Party; some of the leaders are ordinary IT-specialists, the others - successful entrepreneurs.

As for the political program of the party, it represents traditionally left ideas such as introduction of the basic income for all citizens or free education, as well as typically libertarian ones when it comes to

the questions of individual rights (especially freedom of information in the Internet, up to abolishing of the copyright law). The member of Pirate party Marcel-Andre Merkle, in his article "We are researchers, not ideologists," (Merkle, 2011) writes about the necessity to re-think the patterns of political ideologies, "which had been knocked into our heads like Pavlov's reflexes". He argues that economic growth does not necessarily lead to reducing the social sector, freedom does not mean increasing the criminality etc. and points out that the 'pirates' are moving away from traditional ideology, that is also depicted in the title of his article "We are researchers, not ideologists."

Cooperation, knowledge, and communication. Free life. Because the network is based on the main principle (...) [of] network neutrality. " (Merkle 2011)

Apparently we can observe on the example of the Pirate party the forming of the new type of ideology (it is may be more appropriate to describe it rather as 'framework for ideas') of the post-Cold-war period, which responds to the crises of traditional political spectrum as described by Schwarzmantel (Schwarzmantel, 2011).

The 'pirates' haven't until now determined their position in all the political fields, focusing just on several domains such as copyright (open access to all sources of information), protection of personal data, reform of the representative democracy (in accordance with the principles of transparency and citizen participation), infrastructure and education. They often emphasize, that for them the most important question is not «*what*» but «*how*», meaning that their core aim is to change the whole approach to making politics. The party leaders speak less about solutions of the problems, and more about *how* to find these solutions within the paradigm of freedom, which is the key concept of the 'pirates'. (Merkle 2011)

This 'ideological' vacuum is being often criticized by the political opponents of the party and is seen as a threat to the political party system in Germany (Spitz 2011). But on the other hand, this approach to political spectrum seems to be a viable alternative to the conventional one and meets the needs of the new social milieus described above, internet-oriented individualists who want to customize their political views. That means, as the editor-in-chief of the link magazine "Freitag" Jakob Augstein puts it, that they want to decide depending on the political field and on the each specific case if there are 'left' or 'right', they could be 'green' in the questions of education and 'conservative' if it comes to the road building. It is the 'collective mind' of the basic members of the party that according to this concept can find the optimal solutions in each specific case. The instability of such system is being criticized but the opponents, but it seems to be the same time its strength. As Prof. Peter Kruse of the University of Bremen says, the creativity relevant to the modern complex society can only expand in an instable and uncertain environment of a network that permanently provokes its participants to create new ideas. ("Prof. Peter Kruse über Kreativität" 2007).

4. Political communication of the Pirate Party

The communication policy of the Pirate Party, both internal and external, is based on their maxim "more participation, more democracy." For communication with citizens they use more or less the same tools and platforms as the conventional parties, e.g. Facebook, Twitter, blogs, sites. In addition to that they have a "piratewiki" project, which is an open platform, where everybody can contribute to the political deliberative process, as well the whole scope of "pirate-media", such as online-magazine "Flaschenpost" or the Internet-radio.

As for the strategies of online political communication they follow the core rules which were refined during the leading-the-way campaign of Barack Obama in 2008, i.a.: presence in all popular social networking sites and in the blogosphere, combining online and offline activities, merging of private and public spheres, making content that goes viral, creating a strong horizontal network of supporters, who would attract the new ones among their friends.

According to several recent studies (Heimrich 2011; Knaut 2010), the majority of the German parties use interactive tools in their online-communication rather ineffectively, they still perceive political communication mostly through the model "one-to-many". Thus, only about a quarter of the Bundestag deputies (23%) have an official profile on Facebook, and only one-third (36%) of them use this profile to talk to the citizens regularly (several times a week). Only 22% of politicians respond to the posts of the citizens on Facebook (Heimrich 2011).

The main reason for the underdevelopment of the online-communication of political parties in Germany in comparison to the political online-communication in USA is in our opinion the difference in political systems: in Germany the political parties do not depend on donations from citizens as they do in the US. As a consequence, the German parties do not seem to have enough motivation to use all the possibilities of social media tools.

Unlike other German parties, the 'pirates' do take advantage of all the interactive possibilities of the Web. Based on my analysis of the communication of the Pirate party on Facebook conducted in the period from October to November 2011, following conclusions can be made: 1. The official page of the 'pirates' on Facebook is more popular than that of the major parties: it has about 38 000 subscribers (whereas the ruling CDU has 16 000 subscribers, the second largest party in the country SPD - about 24, 000); 2. The activity of the party in social networks is much higher than that of conventional parties (thus, on the official Facebook-page 3-4 postings a day can be listed, with the amount increasing on special events such as party reunion in early December 2011, when the overage amount was 8 postings a day). 3. Facebook official accounts of the 'pirates' are highly interactive, with citizens writing dozens of comments and posting their own content on the wall of 'pirates' on Facebook; 4. The political communication of 'pirates' in social networks is highly personalized: they often use informal language and there is even a signature on the postings on the official page, whereas the big parties make this postings completely impersonal, similar to press-releases. A major role in communication is played by the key persons of the party, such as 24-year-old member of the board of the party Marina Weisband or the chairman Sebastian Nerz: although 'pirates' seek for constructing a horizontal and non-hierarchical party structure, they still can't avoid building hierarchies. These hierarchies are based on the unequal distribution of information flows, where traditional media play a significant role by constantly putting forward the same newsmakers. 6. In their social networks "pirates" often mix personal and public information. They put serious political arguments next to the information about a party they visited yesterday or mentioning that it was cold in the room where press-conference was held. As result of this merging of public and private spheres, pirates give an impression of being "the guys next door," ordinary citizens, that gives voters more trust in their politics. In the case of conventional politicians as for example Barack Obama in U.S. this kind of image is usually being created by PR-people and often gives the impression of being artificial. At the same time similar behavior of young "Generation Z"-politicians is being perceived as authentic.

5. "Liquid Democracy" and its prospects

In terms of reforming of representative democracy 'pirates' advocate the concept of 'liquid democracy', which is nowadays being developed in many countries. The idea is to give each citizen the possibility to vote on each particular issue: s/he can do it himself or delegate his voice to a person he thinks is more competent in this specific issue. This approach aims to give people more power to really take part in the decision-making process besides from going to elections once in four years. This model is however criticized for being inapplicable in huge networks such as the whole nation. Still Pirate party works on developing this mechanism and is already implementing in their internal decision-making process. On the platform 'liquid feedback' each party member can create a profile, where his competencies are shown and also list the persons to whom he delegated his voice on different issues. The chairman of the party is elected by online-voting of all members. In 'liquid democracy' the decision-making is based on the so-called 'intelligence of the network'.

Some researchers (Zolleis, Prokopf, Strauch, 2010), argue that the Pirate Party functions more as a social network than a political party and consider this to be the weakness of the party structure, which would lead to instability and final collapse. The main problem of managing a network is obviously the fact that one cannot control its content. Consequently it is extremely challenging to use it as a basis for a nationwide decision-making. However, the tools of 'liquid democracy' can in our opinion be successfully used for agenda-building, and for participation of citizens in the framing of political issues.

Thus, the Pirate party can be seen as an ongoing experiment in the field of media democracy. The new generation of politicians is trying to set on the agenda fundamental questions of reforming politics according to the needs of the information society, as the "Green-party" did for the society of 1970s and the 1980s with putting new issues into the public discourse. Political opponents accuse 'pirates' of being "hollow", populist and too technocratic in their approach to democracy (Spitz 2011, Dreier 2011). But even critics acknowledge that "they have already changed the politics" (Gathmann 2011), making another parties also deal more intensively with the challenges of the information age.

References

- Castells, M. (1996–1998, revised 2010). The Information Age: Economy, society, and culture. (Vols. 1–3). Oxford: Blackwell.
- Castells, M. (2007). Communication, Power and Counter-power in the Network Society. Retrieved October 15, 2011, from <http://ijoc.org/ojs/index.php/ijoc/article/view/46/35>
- „Edelman Capital Staffers Index 2011: Digitale Medien sind heute politische Kommunikationsrealität“ [online] <http://www.edelman-newsroom.de/edelman-studien> (accessed on 1 December 2011)
- Dreier, C. (2011). „Was ist von den Piraten im Abgeordnetenhaus zu erwarten?“ [online] 22.10.2011 - <http://wsws.org/de/2011/sep2011/pira-s22.shtml> (accessed on 29.09.2011)
- „Facebook-Euphorie verfliegen – Deutsche Politiker setzen kaum auf Wähleransprache via Facebook“ [online] <http://www.tu-ilmeneau.de/pr/nachrichtenarchiv/einzelnachricht/newsbeitrag/6653/>
- Gathmann, F. (2011). „Gegenangriff der Möchtegern-Piraten“ [online] <http://www.spiegel.de/politik/deutschland/0,1518,792502,00.html> (accessed on 25.11.2011)
- Habermas, J. (1989). The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society. Cambridge: Mass, MIT Press.
- Hawkins P., Schmidt L. (2008). ‚Gen Z: digital natives‘. [online] <http://www.essentialkids.com.au/entertaining-kids/games-and-technology/gen-z-digital-natives-20080716-3g5p.html?page> (accessed 10.10.2011)
- Heimrich, L. (2011) Politische Public Relations in sozialen Online-Netzwerken. Eine inhaltsanalytische Untersuchung zum Einsatz von Facebook-Seiten in der Kommunikation zwischen Politikern und Bürgern, [online] http://www.wolfgang-schweiger.de/download/Studie_Facebook-Euphorie.pdf (accessed on 15.12.2011)
- Hofmann, N. (2011) „Programm der Piratenpartei Freiheit, die wir meinen“ [online] <http://www.sueddeutsche.de/politik/programm-der-piratenpartei-freiheit-die-wir-meinen-1.1146146> (accessed on 30.10.2011)
- Merkle, M.-A. (2011) „Wir sind Forscher, keine Ideologen“ [online]
- Knaut, Annette. Politikvermittlung online: Abgeordneter des Deutschen Bundestages im Web 2.0. // Mediendemokratie. Hrsg. Gerhard Göhler, Annette Knaut, Cornelia Schmalz-Jacobsen, Christian Walther. Frankfurt am Main, 2010. S. 17. <http://www.heise.de/tp/artikel/35/35721/1.html> (accessed on 30.10.2011)
- „Piratenpartei klettert auf zehn Prozent“ // <http://www.spiegel.de/politik/deutschland/0,1518,792622,00.html> (accessed on 10.11.2011)
- „Piraten: Partei oder Posse“, talk-show „Augstein und Blome“ [online] <http://www.youtube.com/watch?v=ZR4T5U8A64w> (accessed on 15.11.2011)
- “Prof. Peter Kruse über Kreativität“ (2007) [online] http://www.youtube.com/watch?v=oyo_oGUEH-I&feature=youtu.be (accessed on 09.01.2012)
- „Sinus Milieus“ [online] <http://www.sinus-institut.de/loesungen/sinus-milieus.html> (accessed on 02.10.2012)
- Spitz, M. (2011) „Die Piraten machen es sich leichter“, [online] <http://www.spiegel.de/politik/deutschland/0,1518,791683,00.html> (accessed on 11.10.2011)
- Schwarzmantel, J. (2008) Ideology and Politics, Sage Publications Ltd, London.
- Zolleis U., Prokopf S. and Strauch F. (2010) Die Piratenpartei. Hype oder Herausforderung für die deutsche Parteienlandschaft? Hans-Seidel-Stiftung, München.

eGovernment in a Swedish Municipality – Change Management in the Planning Process

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Abstract: eGovernment continues to be an interesting area of study, especially since it is not simply about the implementation of ICTs, but rather, as this paper will show, about a larger change management process. When trying to understand the factors behind successful examples of eGovernment in the context of change management, most research so far focuses on the implementation phase in a literal sense and not on the planning phase, that precedes the implementation phase, or the evaluation phase that follows. This paper aims at remedying this by focusing on the planning phase; the development of an eGovernment strategy and vision, which is the departing point for a future implementation process. Through an in-depth case study of the work done at a Swedish municipality, the city of Vasteras, this paper aims at answering the question: “Which are the key change management aspects of an eGovernment planning process?” By focusing on the planning phase of eGovernment in a Swedish municipality, this paper develops the knowledge and understanding of this kind of endeavour. Even if ICTs can be seen as a means to modernize government, technology alone cannot break down organizational and cultural barriers – something that is necessary in order for the full benefits of eGovernment to be realized. The paper is hence primarily empirical in contribution. However, this paper also provides useful insights on the planning process for eGovernment and necessary aspects when creating an eGovernment strategy.

Keywords: eGovernment strategy, eGovernment planning, change management, stakeholder management, organizational set-up, eGovernment and business strategy alignment

1. Introduction

For more than a decade now, it has been proposed that Information and Communication Technologies (ICTs) have the possibility of transforming public services in various ways. It has for example been argued that they support public sector reforms by assisting and enabling the automation of existing human executed processes, as well as help creating new IT-executed processes (Heeks, 1999). Furthermore, since ICTs can be designed around citizens’ needs rather than just structures or the convenience of civil servants, ICTs can transform the way public services are delivered (Tapscott, 1996). ICTs may also be used for purposes of marketing and place development (Gascó-Hernández, 2009) for creating mGovernment (Kushchu, 2007) as well as a means towards the goal of sustainable development in various ways (Hallin & Karrbom-Gustavsson, 2009). (Hallin & Karrbom-Gustavsson, Organizational Communication and Sustainable Development - ICTs for mobility, 2009)

eGovernment, a field that “deals with the major initiatives of management and delivery of information and public services taken by all levels of governments” (Hu, Lu, Pan, & Wang, 2009, s. 979) have by some also been seen as “the use of ICT in (...) the inside, outside, and between of government agencies” (Persson & Goldkuhl, 2010, p. 46). Furthermore, the implementation of eGovernment can be understood as a change management process. As will be elaborated later in this paper, several factors have been shown to be important in eGovernment implementation from a change management perspective. However, what is striking in this research is its focus on the implementation phase, meaning that the planning phase as well as the evaluation phase are still understudied. This study aims at filling the knowledge gap regarding the planning phase.

Hence, the purpose with this paper is to answer and elaborate on the following question: *Which are the key change management aspects of an eGovernment planning process?*

In Sweden, the so called 24/7-agency - Sweden's first government institution focusing on the development of eGovernment - already in 2000 issued a set of criteria for how public authorities in the country were to enhance its accessibility and service-provision round the clock to all citizens. **Error! Reference source not found.** The year after, the first eGovernment strategy was established in a Swedish municipality. Sweden has also been prominent in delivering eGovernment from a user-perspective (Hallin & Lundevall, 2007). Since the turn of the millennium a lot has happened, technologically as well as in terms of ways and the extent of which users have access to and use ICTs. EU has issued its Digital Agenda for Europe and National Agendas are being produced as we speak. Thus, today several municipalities are updating or formulating new eGovernment strategies.

This paper departs from an in-depth case study of one Swedish municipality - the City of Vasteras, which is interesting since it is at the forefront of eGovernment in Sweden. First, a brief introduction to the area of eGovernment is provided. It is concluded that eGovernment by and large should be seen as a change management process. The paper continues with a description of the method used in the study, and the case of Vasteras is described. Then, an analysis of the case follows, highlighting three important aspects of change management in the planning process of eGovernment that emerged through the empirical case-study.

2. eGovernment and change management

There are several definitions of eGovernment. The World Bank's definition is as follows: "EGovernment refers to the use by government agencies of information technologies (...) that have the ability to transform relations with citizens, businesses, and other arms of government." (Becker, Crandall, & Fisher, 2010, s. 1) A more relevant and wider definition of eGovernment is suggested by Persson & Goldkuhl (2010) "the use of ICT in (...) the inside, outside, and between of government agencies" (p. 46) because of the need to be able to understand and discuss eGovernment as a management regime and therefore need to discuss the client side as well as the internal organizational changes. (Persson & Goldkuhl, 2010) Another study argues that eGovernment is:

The field [that] deals with the major initiatives of management and delivery of information and public services taken by all levels of governments (including agencies, sectors) on behalf of citizens, business, involving using multi-ways of internet, web site, system integration, and interoperability to enhance the services (information, communication, policy making), quality and security, and as new key (main, important) strategy or approach.

(Hu, Lu, Pan, & Wang, 2009, s. 979)

In this paper this is the definition that we will depart from.

It has been suggested by (Aichholzer, 2004) that eGovernment can be looked upon as a comprehensive change program, henceforth similar to Hu, Lu, Pan and Wang's (2009, s. 979) definition of eGovernment where the eGovernment field deals with major initiatives. This is supported by Persson & Goldkuhl (2010) who states that "eGovernment in practice has somewhat changed from ICT in public administration to ICT mediated change in public administration" (p. 46). Using Guha *et al.*'s theoretical framework of eGovernment change management, (Burn & Robins, 2003) have also identified a need to integrate the change management aspect in eGovernment. Another indicator pointing at the importance of change management in eGovernment, is that the CIO function (or role) in municipalities have gradually transformed towards a function that is more strategic in nature, versus the traditional operational role. (Almazan & Gil-Garcia, 2011)

It can thus be concluded that in order for an eGovernment-process to be successfully implemented, the process must be seen as a change management process.

There are a significant amount of studies on eGovernment as a change management process. However, many of these focus on the implementation of ICTs in eGovernment-projects. Studies from Australia (Brown, Hossan, & McNeil, 2011), Denmark (Agger Nielsen, 2006), Malaysia (Mohamed, Hussin, & Hussein, 2006), Saudi Arabia (AL-Shehry, Rogerson, Fairweather, & Prior, 2006), Slovenia (Štemberger & Jaklič J, 2007), and the U.K. (Carr & Gannon-Leary, 2007) all put a major focus on ICT-implementation or technology. Some studies acknowledge the need for change management and that technology should not be in focus, one example is Carr & Gannon-Leary (2007) that identifies technology-driven visions as misleading. Not much has been done in this respect though.

The fact that very few studies on eGovernment as a change management process with focus on the preparatory work and planning-phase had been carried out is, in our view a gap in the knowledge about eGovernment implementation. It could be argued that the planning phase in all projects – also change management initiatives – is seen as crucial for success, regardless how abstract and vague the project goal might be (Engwall, 2002).

The researchers that have discussed change management from a wider eGovernment perspective than simply from an ICT-implementation perspective (Brown C. V., 1993) (Weerakkody, El-haddadeh, Sabol, Ghoneim, & Dzipka, 2011) (Chen, Chen, Huang, & Ching, 2006) (Vuksic, Pozgaj, & Milanovic, 2010) have not focused on the planning of eGovernment. However, other studies have stressed the importance that there is an eGovernment plan, strategy, vision or policy (Moon, 2002; Alshawi, Altameem, & Zairi, 2006 (november); Lim, Pan, & Tan, 2007; Ibragimova, Koh, & Prybutok, 2006), but none of these take on a path for a more in-depth study about the creation process and the change management aspects of the eGovernment strategy.

In summary, studies on eGovernment and change management tend to primarily focus on the implementation of eGovernment and the related ICTs. However, a limited amount of studies have actually studied the planning phase of the eGovernment change management processes, although a number of studies have stressed the importance of performing such planning.

3. Method

In order to understand the successful positioning of eGovernment strategies today, an in-depth case study has been carried out. The case chosen is Vasteras, Sweden's sixth largest municipality.

The City of Vasteras has long been prominent as one of the Swedish municipalities that have invested a lot in IT - historically perhaps more for economic and organizational reasons. Today, Vasteras is an exciting eGovernment organization since the information systems (IS) and information technology (IT) issues are constantly on the top management's agenda. Vasteras is also one of the few municipalities in Sweden where the CIO is part of the city's management team.

Another distinctive feature of Vasteras is the great interest in IS/IT issues from the City's political level. The engagement is from both the major political parties. From a strategic point of view, this is seen as important in order to prevent that a shift in political majority changes the potential and strategy of the eGovernment work. This interest and participation in the ICT area emancipates both from a strictly organizational perspective but also from the idea that eGovernment initiatives can strengthen the image of the City. Hence, the study of Vasteras should be seen as an intrinsic study of a case that may help us understand a larger population of similar cities (Gerring, 2004) (Berg, 2007). In addition, an in-depth case study like the one presented here can also help us develop new theory, since it is when studying a case in detail that the complexity of reality is seen. (Eisenhardt, 1999)

The empirical material has been collected over time by three of the authors of the paper who, in different capacities, have been and still are, involved in the development and implementation of the eGovernment-strategy in Vasteras. One of us is a CIO in the city, with the main responsibility for the development and implementation and two of us are consultants, hired to help in the process. This means that we have unlimited access to empirical material. The fourth author of this paper has taken on the role of asking the critical questions and surveying the empirical data. Hence, the present paper can be characterized as having an action-research approach, where the continuous and joint reflection regarding the progressive problem solving led by three of the authors in the work of developing and implementing an eGovernment strategy, forms the basis for the theories presented. (Reason & Bradbury, 2001)

Action-research is a well-known and respected way of conducting research where the research is carried out alongside the work of taking an active part of a change-process. This means that the knowledge developed is created together with those that participate in the process (cf Svensson, 2007). A common critique against action-research is the loss of objectivity on behalf of the researcher, and it is certainly true that the kind of objectivity as envisaged in positivistic research cannot be achieved through action-research methodology. This is however not the aim since action-research builds on a different ontological and epistemological foundation. The objective in action-research is rather to build solid and trustworthy knowledge through a reflexive approach, where constructive criticism forms the basis for knowledge development. In the present study, this is why four authors are

involved. Representing different perspectives and views on the empirical material we have worked, in a constructive way to both collect and analyze the empirical material. (Svensson, 2007) The case of Vasteras is a good example of eGovernment as it drives a major initiative, including both management and delivery of information and public services. On the perspectives of citizens and business from the definition of eGovernment stated earlier, the eGovernment strategy case in Vasteras does in its content deal with both. As the eGovernment strategy in Vasteras involves the usage of multi-ways of internet, interoperability and is enhancing services, quality as well as security, it does apply to the definition of eGovernment used in this paper. The document is also a new key strategy, as revealed by the name of the eGovernment strategy in Vasteras – eStrategy. The empirical material consists of formal documents, notes taken by the three of us that have participated in the change management process at meetings, workshops and interviews with people in the daily operations. Furthermore, 7 semi-structured interviews have been carried out with different persons involved in the process.

Table 1: Empirical material

EMPIRICAL MATERIAL	EXAMPLE
Formal documents	Business visions, strategies and guidelines
Notes from meetings	Workshops, interviews and project meetings
Interviews	Chief of Staff City Archivist Enterprise Architect HR Director ICT Strategist Proaros IT Director Strategic Economic Planning

Building on the empirical material, a chronological account of the process was developed, and the various “voices” among the informants were taken into account. Then, an analysis was made, through the lens of change management. This helped us to identify three aspects of change management in the planning process of eGovernment.

In the following, a brief introduction to the City of Vasteras will be given, then we delve into the results; the analysis, and finally, we provide our conclusion.

4. Organization of Vasteras

The municipality of Vasteras employs about 10 000 people and has a turnover of approximately €750 million. The City of Vasteras is organized as visualized in Figure 1. The City Council is the city’s highest decision-making body and makes decisions that concern the municipal finances, overall planning and organizational structure, such as electing members for the Executive Committee. The *Executive Committee* is responsible for the overall management and coordination of the municipality and is also responsible for city finances. The Executive Committee is assisted by a number of politically appointed committees and boards responsible for various areas. Something that makes Vasteras special compared to some other Swedish municipalities is that Vasteras uses the *client-contractor model*. This means that each committee has an administrative unit, with employees who prepare items of business and supervise that political decisions are implemented and that business is conducted within the committee’s area of responsibility. (City of Vasteras, 2012)

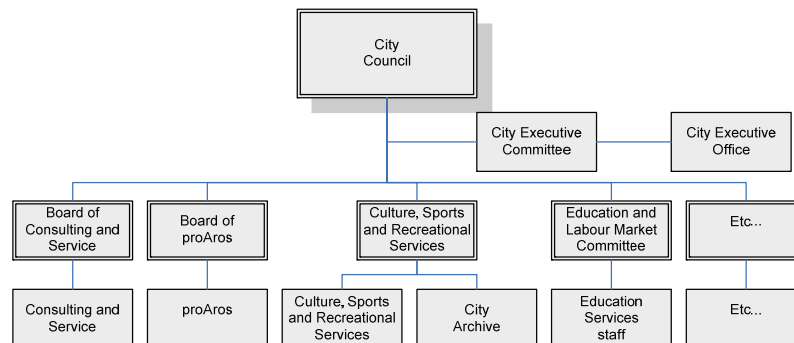


Figure 1: Organization of the City of Vasteras

4.1 The IT-organization

The IT-organization of Vasteras is structured in accordance with the city's client-contractor model. A small strategic unit of the City Executive Office consists of the eStrategist (CIO), one IT-Architect and one IT-controller. The CIO is process owner of IT and eGovernment (i.e. client) and part of the Executive Office Management Team along with other roles including CEO, CFO, CIO, Welfare Director etc.

Within the city's shared service centre (Consulting and Service), the city's IT-department (i.e. contractor) reside. The department is headed by an IT-manager. The services that they provide are marketed in a consultant-like manner and ordered by the CIO. The annual IT cost is approximately €20 million thus ~2.7% of the total city budget.

4.2 The need for a new eGovernment strategy

In 2011, the CIO identified a need to bring forward a new set of governing documents in the eGovernment area. The old documents were out of date and the content was not synchronized with the business strategy, instead, rather focused on technology platforms and integration technologies. One additional problem was that there were a mismatch in life span between the city's business strategy and the previous IT-strategy.

On behalf of the former IT-strategy, large trials in eGovernment have occurred over the years. For instance, the City initiated an "e-service factory" into which the municipality invested €6.5 million. The investment was led by the IT-department and focused on different models for enterprise architecture, process modelling and technical theories. From an ICT-perspective, the work was well done, but because of a lack of understanding of the core business, the project was terminated after two of the planned three years and the result was quite poor compared to the project scope and budget.

Against this background, the CIO concluded that the municipality needed an entirely new approach to create a common ground and a common goal. It was decided that the core business must be involved in the formulating process of the new eGovernment strategy, not only in the implementation projects.

4.3 The production of the new eGovernment documents

To bring forward the new eGovernment documents, the CIO together with qualified consultancy support, started to review how the strategy would relate to the other governing documents of the city, region and national policy documents. Early on it was decided to have a alignment between the city governing document and the new eGovernment strategy.

In order to define the business demands, more than 40 key people were invited to contribute, development managers as well as business managers, grouped according to four business clusters:

- City planning and property
- Health and social care
- Culture, Sport and Recreation
- Education

In a number of workshops target groups, challenges, etc., were identified. At the same time the organization started the process of accepting the coming changes. First, only the business cluster representatives were invited and as a second step, the results were presented to a group of IT-people and more IT-specific challenges were identified. Parallel with this a Green IT audit was conducted, and the results were used in the strategy formulating process. When the results of the first part was final, the process started all over again with new workshops to reconcile to make sure that the summary and preliminary findings were in line with the group's opinion.

The strategy was then sent out as a referral to all participants in the process and was rewritten according to the comments received. The final version will then be decided upon by the Executive Committee during spring 2012.

When talking to stakeholders in the organisation, this work process was essential. The Chief of Staff once said "it is so important that the business representatives were included in the strategy

formulating process – that they had the possibility to define in which areas they need to be supported by ICTs”. The Enterprise Architect formulated it as “now there’s a traceability– we can actually see where the goals comes from, and also, there’s an engagement among stakeholders which we will benefit from in the future”.

According to the CIO, a great challenge during the planning phase has been to get everyone to understand what eGovernment is. First of all, this was a problem when attracting the right people to the workshop. Sometimes business people would delegate their attendance to IT-people just because of a lack of understanding that eGovernment in fact is relating to the core business. Secondly, several times, the issues brought up were perceived not to belong to the scope of the strategy, as they were core business issues.

During the work, the CIO also noticed, somewhat to his surprise, that another work that he had undertaken in parallel to the work with developing the eStrategy caught a lot of attention and interest from various people in the municipality. This was the work with “Green IT”. In order to make Green IT a natural and integral part of the daily work in the City, the CIO decided to incorporate environmental issues in the eGovernment strategy instead of producing a separate strategy document in this area.

Another important issue is that the new strategy is aligned in time and content with the city's Strategic Plan 2012-2015. The eStrategy is now a "digital dimension" of the Strategic Plan which means that these two policies do not "compete".

5. Analysis

As previously shown, the research on change management is a well-known topic in the field of eGovernment but the focus is mostly on the implementation of ICTs. Furthermore, the research that does stress the importance of strategic documents does not consider the planning process.

This analysis will primarily be empirical in contribution. The case study of Vasteras will contribute to this analysis since three aspects of change management in the planning process of eGovernment can be identified:

- Stakeholder Management through the inclusion of people from the daily operations, and a unifying concept.
- How the Organizational set-up supports strategic-decision making as something different and separate from daily operations.
- The importance of strategic alignment between the eGovernment strategy and the overall organizational vision and business strategy.

5.1 Stakeholder management

When it comes to change management, the involvement of stakeholders is essential. As we have seen, the City of Vasteras works according to this principle already in the planning process. The work process of the production of the new eGovernment documents was all about finding out about business challenges. However, the workshops actually became a road trip for the participants to engage in and understand the concept of eGovernment. A lot of people were actually surprised that the focus was on business and not technology, and in the end, people with too much knowledge on technology in contrast to business had very little to share. Had everybody the same working knowledge about what eGovernment really is, maybe some persons that chose not to participate had reacted differently.

The case also shows how a concept that unified the common stakeholders was found in the area of Sustainability and Green IT. The reason for this is found in the Vision and Strategic Plan but also in all of the ongoing initiatives in the city. Both high level stakeholders as well management and operations have become involved in this work. It has been suggested that the motivation of introducing Green IT differs from the introduction and adoption of technology in general. (Molla, 2009) This can be the reason why business stakeholders can easier accept eGovernment in this setting. Or as the ICT-Strategist Proaros said “If you do not include Green IT, it isn’t a modern eStrategy”.

5.2 Organizational set-up

Another aspect that seems crucial in the development of the eStrategy of Vasteras is the organizational set-up. As mentioned, Vasteras has a client-contractor model, which, in the planning process, means that when planning for eGovernment, the contractor (CIO) turns to the client to listen in on needs and plans for the future, in this case involving the client in workshops to help build the eGovernment strategy for the upcoming years. This set-up should provide good grounds for future work, since it enables sharing and listening both horizontally and vertically throughout the organization. (Hackney, 2003) Without the client-contractor model, the risk is that the IT process owner would take a more introvert perspective and turn to the IT department for planning the future. In this case, having a client-contractor model has helped to clarify the client and stress the importance of IT listening in on the client needs and plans for the future.

Having the roles of CIO, IT Architect and IT Controller as part of the City Executive Office does not only show that a number of central IT staff are a part of the upper management. The roles being located in the City Executive Office may also give access to important discussions on strategic topics, providing IT with insights needed for making IT a strategic support to the business. This might also image-wise show to the organization that IT is not “only a contractor” but that the CIO also can work as strategic advisor. For the IT department, having a number of IT-related roles in the City Executive Office might also show that the city acknowledges the importance of IT as a vital part of the business.

Therefore, the organizational set-up supports strategic decision-making as something different to the daily operations. This is not only important in the planning process but essential for the coming implementation; “Organizational, institutional, political, and other factors greatly affect the CIO’s capacity to implement eGovernment initiatives.” (Almazan & Gil-Garcia, 2011)

5.3 Strategic alignment

Strategic alignment has proved to be of importance in the planning process for Vasteras. One simple example is that the involved clients are helping to plan the future of IT in the City of Vasteras through the eGovernment strategy because they can relate and understand the goals, as the goals stem from the city vision and strategic plan. But ensuring that there is a strategic alignment between the IT-related documents (the ePolicy and the eGovernment Strategy) also directly creates a link between what is important for the business and the IT goals, meaning that it becomes more visible how IT helps the business to approach the goals set in the vision and the strategic plan. (Persson & Goldkuhl, 2010)

Adding to that, having a strategic alignment between the governing business documents and the eGovernment documents also help to clarify priorities for IT. Although IT might assume that a certain project is a priority for the business, the alignment between the business documents and the eGovernment documents makes it transparent which goals and in turn projects that are a priority for the business, hence guiding the priorities for IT.

6. Conclusion

The purpose with this paper was to study the key change management aspects of the eGovernment planning process. The paper identified a gap in the previous research; a number of studies has covered eGovernment and change management, but no studies have been found on the change management aspects of the eGovernment planning process.

In this paper a study of the city of Vasteras, an interesting case of eGovernment due to its position at the forefront in eGovernment implementation, shows that there are a number of key change management aspects in the planning process for eGovernment. The three aspects found where; stakeholder management, the organizational set-up and strategic alignment.

We believe that a lot of things can be learned from the Vasteras-case and that the case can function as a source of inspiration for other municipalities. In the future, it will also be possible to evaluate the implementation of the eGovernment plan which can further deepen the knowledge on eGovernment implementation in a larger perspective.

The paper is hence primarily empirical in contribution. Not many studies exist regarding the planning phase of eGovernment as a change management process, and it is not until the full implementation

has been evaluated that a full theory can be formulated. However, this paper has provided useful insights on the planning process for eGovernment and how the creation of an eGovernment strategy can work.

References

- Agger Nielsen, J. (2006). Information and Communications Technologies (ICT) in public administration. How the implementation of ICT influences organizational changes. The Danish Case. *EGPA Conference* (pp. 1-12). Milan: Aalborg University.
- Aichholzer, G. (2004). Scenarios of eGovernment in 2010 and implications for strategy design. *Electronic Journal of eGovernment* , 1-10.
- Almazan, R. S., & Gil-Garcia, J. R. (2011). The Role of the CIO in a Local Government IT Strategy: The Case of Merida, Yucatán, Mexico. *Electronic Journal of eGovernment* (Volume 9 Issue 1), 1 - 14.
- Alshawi, S., Altameem, T., & Zairi, M. (2006 (november)). Critical Success Factors of EGovernment: A Proposed Model for EGovernment Implementation. *Innovations in Information Technology* , 1-5.
- AL-Shehry, A., Rogerson, S., Fairweather, N. B., & Prior, M. (2006). The Motivations for Change Towards EGovernment Adoption: Case Studies from Saudi Arabia. *eGovernment Workshop '06*. London: Brunel University.
- Becker, S., Crandall, M., & Fisher, K. E. (2010). eGovernment Services Use and Impact through Public Libraries: Preliminary Findings from a National Study of Public Access Computing in Public Libraries. *Proceedings of the 43rd Hawaii International Conference on System Sciences - 2010* (pp. 1 - 10). Seattle, WA, USA: Inf. Sch., Univ. of Washington.
- Berg, B. L. (2007). *Qualitative Research Methods for the Social Sciences*. Boston: Pearson.
- Brown, C. V. (1993). The successful CIO: integrating organizational and individual perspectives. *Proceedings of the 1993 conference on Computer personnel research*. St Louis, Missouri, United States.
- Brown, P. D., Hossan, D. C., & McNeil, D. N. (2011). The Dynamics of Change in eService Implementation: The Case of Australian Local Government. *International Journal of Business and Management* , 6 (11), 47-56.
- Burn, J., & Robins, G. (2003). Moving towards eGovernment: a case study of organisational change processes. *Logistics Information Management* , 16 (1), 25-35.
- Carr, J., & Gannon-Leary, P. (2007). eGovernment Leaders, Organisational Change and ICTs: Learning from FAME and other eGovernment Experiences. *The Electronic Journal of eGovernment* , 5 (1), 11-20.
- Chen, Y., Chen, H., Huang, W., & Ching, R. (2006). EGovernment Strategies in Developed and Developing Countries: An implementation Framework and Case Study. *Journal of Goba Information Management* , 14 (1), 23-46.
- Eisenhardt, K. M. (1999). Building Theories from Case Study Research. *Academy of Management Review* , 14 (4), ss. 532-550.
- Gerring, J. (2004). What is a case study and what is it good for? *American Political Science Review* , 98, 341-354.
- Hackney, R. (2003). Towards eGovernment business process change. *Business Process Management Journal* , 9 (2).
- Hu, G., Lu, M., Pan, W., & Wang, J. (2009). The widely shared definition of eGovernment - An exploratory study. *The Electric Library* , 27 (6), 968-985.
- Ibragimova, B., Koh, C. E., & Prybutok, V. R. (2006). The importance of strategic readiness in an emerging eGovernment environment. *Business Process Management Journal* , 12 (1), 22-33.
- Lim, E. T., Pan, S.-L., & Tan, C.-W. (2007). EGovernment Implementation: Balancing Collaboration and Control in Stakeholder Management. *International Journal of Electronic Government Research* , 3 (2), 1-28.
- Mohamed, N., Hussin, D. H., & Hussein, D. R. (2006). Enabling Change Factors and IT Success in the Malaysian EGovernment Implementation. *Proceedings of the Tenth Pacific Asia Conference on Information Systems* (pp. 1107-1125). Kuala Lumpur, Malaysia: Association for Information Systems.
- Molla, A. (2009). Organizational motivations for Green IT: Developing and exploring a Green IT . *Thirtieth International Conference on Information Systems*. Phoenix.
- Moon, M. J. (2002). The Evolution of EGovernment among Municipalities: Rhetoric or Reality? *Public Administration Review* , 62 (4), 424-433.
- Persson, A., & Goldkuhl, G. (2010). Government Value Paradigms—Bureaucracy, New Public Management, and eGovernment. *Communications of the Association for Information Systems* , 45-62.
- Reason, & Bradbury. (2001). *Handbook of Action Research* (2nd ed.). London: Sage.
- Štemberger, I., & Jaklič J, M. (2007). Towards eGovernment. *International journal of information* , 27 (4), 221-232.
- Svensson, L. (2007). It's being close that makes it possible to accept criticism. *International Journal of Action Research* , 3 (3), 278-296.
- Vuksic, V. B., Pozgaj, Z., & Milanovic, L. (2010). EGovernment Policy and Implementation in Croatia. *Proceedings of the ITI 2010 32nd International Conference on Information Technology Interfaces June 21-24* (pp. 423-428). Cavtat, Croatia: University of Zagreb.
- Weerakkody, V., El-haddadeh, R., Sabol, T., Ghoneim, A., & Dzupka, P. (2011). EGovernment implementation strategies in developed and transition economies: A comparative study. *International Journal of Information Management* .

“E-Environment” as Part of the National Strategy “E-Romania”

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Abstract: The national strategy “e-Romania” follows the European initiative “European Digital Agenda” which aims at ensuring everyone’s access to broadband services by 2013 and creating real eGovernment services which will mainly contribute to: achieving the recent development goals, reducing administrative costs and leading to a better involvement of citizens in the government act. Following the recognition of a right to a healthy environment by the case law of the European Court of Human Rights and the European and international norms related to the public access to environmental information, public participation in decision-making, and access to justice in environmental matters, we consider that launching the e-Environment will create a citizen’s liability culture in relation to the Romanian environment and nature. The implementation of e-Environment as part of eGovernance concept will lead to a better structure of the information at national and local levels in a consistent, coherent and accessible manner, as anyone may get relevant information and may use on-line services. E-Environment will optimize the implementation of different environmental projects and will reduce the risks of pollution, as an achievement of both the prevention and precaution principles. The public cooperation is important in order to promote a project. Prior to the debate of any project, it is essential to present all the benefits and impact of any potential change. E-Environment is a solution to present the initiatives of the government and to interact with the citizens on different environmental issues.

Keywords: e-Environment, e-Romania, eGovernment

1. Introduction

The concept of the e-Environment was presented at the second Ad hoc Committee on E-Democracy of the Council of Europe plenary meeting, which was held in Strasbourg on the 8th and the 9th of October 2007. The legal basis of the e-Environment is the United Nations Economic Commission for Europe Convention on access to information public participation and decision-making and access to justice in environmental matters (Convention, 1998), adopted in Aarhus, (hereinafter “the Aarhus Convention”), which was implemented in the European Community. The EU Directives which support Aarhus Convention are the following:

- Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313/EEC (EC Directive, 2003), (hereinafter “the Aarhus Directive”);
- Directive 2003/35/EC of the European Parliament and of the Council of 26 May 2003 providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC - Statement by the Commission (EC Directive, 2003);
- Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information (EC Directive, 2003) and
- Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) (EC Directive, 2007), which aims to improve the accessibility and interoperability of spatial data. INSPIRE is based on similar principles to SEIS and successful implementation of this Directive will go a long way towards overcoming existing inefficiencies relating to the use and usability of spatial data stored by public authorities. It is important to recognise, however, that INSPIRE will not directly address data of a non-spatial or non-numerical nature, will not by itself guarantee organisational consolidation within Member States, and will not lead directly to an improvement in the quality and comparability of data.

Electronic access to Environmental information (the e-Environment) belongs to e-Participation and eGovernment initiative and it is going to be one of the fundamentals of eGovernance.

The Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: *Towards a Shared Environmental Information System (SEIS)* (European Commission, 2008) provides the political, organization and technical basis for the e-Environment, therefore that any citizen to be informed about environmental matters and to use this information for active participation in decision making. The Directorate-General Environment, the European Environment Agency, the Statistical Office of the European Communities (Eurostat) and the Joint Research Centre control the development of the SEIS, in collaboration with Global Monitoring for Environment and Security (GMES) initiative, which represents a concerted effort to bring data and information providers together with users, so they can better understand each other and make environmental and security-related information available to the people who need it.

The national strategy “e-Romania” follows the European initiative “European Digital Agenda” which aims at ensuring everyone’s access to broadband services by 2013 and creating real eGovernment services which will mainly contribute to: achieving the recent development goals, reducing administrative costs and leading to a better involvement of citizens in the government act.

2. A right to a healthy environment in the case law of the European Court of Human Rights

The right to a healthy environment is one of the relatively recent acknowledged and guaranteed of the fundamental human rights, very complex in significance and difficult to ensure in both material and procedural sense.

Considering the recognition of a right to a healthy environment, the e-Environment should create a citizen’s liability culture in relation to the Romanian environment and nature.

The European Court of Human Rights (hereinafter “the ECHR”) has dealt with an important number of human rights cases with an environmental element. Article 8 of the European Convention on Human Rights has been used consistently by individuals in claims against states, mainly relating to the levels of pollution that they have been subjected to. According to this article everyone has the right to respect for his private and family life, his home and his correspondence; there shall be no interference by a public authority with the exercise of this right except such as is in accordance with the law and is necessary in a democratic society in the interests of national security, public safety or the economic well-being of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights and freedoms of others.

In 1994, the ECHR decided for the first time that the right to a healthy environment is included in article 8 of the European Convention which provides everyone’s right to respect for his private and family life (ECHR, 1994).

In the case *Lopez Ostra v. Spain*, the ECHR considered that Spain did not succeed in finding a balance between the general local interest of having a waste-treatment plant and the applicant’s effective right to respect for her home and her private and family life.

The ECHR stated that serious environmental pollution may affect a person’s welfare and deprive him/her from enjoying his/her homes in such a way as to affect his/her private and family life even if it is not a severe hazard to the deprived person’s health.

According to a recent case against Romania, *Tătar v. Romania*, the ECHR held Romania responsible on the basis of article 8 of the European Convention, because the right to a healthy environment of both claimants was breached given the environmental impact of a cyanide technology used for exploitation of gold (ECHR, 2009).

Following an accident which occurred in January 2000, a gold mine located in the vicinity of the applicants’ home, released about 100,000 m³ of cyanide contaminated tailings water into the environment and it did not stop its activity after that accident. The applicants complained that (i) the mining activity was a health hazard for the people living near the mine; (ii) it posed a threat to the environment and (iii) it was aggravating their son’s asthma.

Although the ECHR decided that the applicants had failed to prove any causal link between their son's medical condition and his exposure to cyanide, the gold mine had breached the precautionary principle given that it continued its industrial activity after the accident.

The ECHR ascertained that the Romanian authorities did not impose a company functioning conditions suitable to avoid the damage to the environment and human health, breaching the precautionary principle which could have requested a restriction of the activity, given that there were serious doubts related to the safety of the technological process. According to the precautionary principle the absence of certainty regarding current scientific and technical knowledge could not justify any delay of the state in adopting proportionate and effective measures.

3. Aarhus Convention – Aarhus Directive

Information, participation and access are considered by the Aarhus Convention adopted in Denmark on the 25th of June 1998 as an expression of a right of every individual which the states have the legal obligation to recognize and enforce. (Wennerås, 2007)

As a material right, the right to environment assumes the provision of a high quality "healthy and ecologically balanced" environment, while in a procedural point of view, it requires recognition of three rights: (i) access to environmental information, (ii) public participation in environmental decision-making and (iii) access to justice in environmental matters.

It is noteworthy that the preamble of the Aarhus Convention states that "every person has the right to live in an environment adequate to his or her well-being and the duty, both individually and in association with others, to protect and improve the environment for the benefit of present and future generations." (Postiglione, 2010)

The Convention defines "the public concerned" as "the public affected or likely to be affected by, or having an interest in, the environmental decision-making; for the purpose of this definition, non-governmental organizations promoting environmental protection and meeting any requirements under national law shall be deemed to have an interest."

The Convention provides a general right of access to "environmental information" which is incumbent on the public authorities for individuals and NGOs without their stating any particular interest in the case. (Born, 2010)

Article 3 of the Convention defines the environmental information which includes (i) "the state of elements of the environment" (air, water, soil, landscape and natural sites, biological diversity etc.); (ii) "factors", such as substances, energy, noise and radiation, activities, measures, environmental agreements, policies, legislation, plans and programs affecting or likely to affect the elements under above mentioned point (i); and (iii) "the state of human health and safety, conditions of human life and cultural sites and built structures, inasmuch as they are or may be affected by the elements" under above mentioned points (i) and (ii).

"Environmental information shall be made available as soon as possible" and no later than one month after the submission of a request unless the volume and the complexity of the requested information justify an extension of this period up to two months.

The right of access to environmental information can be refused on formal and substantive grounds. The grounds for refusal provided in the Convention "shall be interpreted in a restrictive way taking into account the public interest served by disclosure". If access to information is denied, the authority must issue its decision within a short period of time, stating the reasons for the refusal.

The way in which public authorities make environmental information available to the public is transparent and that environmental information is effectively accessible to the public through electronic databases.

The right of access to justice in environmental matters ensures the right to environment and also of observing the duty to protect and improve the environment. Such right of access refers to three situations: (i) access to justice as procedural guarantee of access to information; (ii) access to justice for the guarantee of public participation in environmental decision-making and (iii) access to

administrative or judicial procedures “to challenge acts and omissions by private persons and public authorities which contravene provisions of its national law related to the environment”.

The persons entitled to exercise their right to access to justice in achieving the fundamental right to environment are: (i) any person who considers that his or her request for information has been ignored, wrongfully refused, whether in part or in full, inadequately answered, or otherwise not dealt with according to the provisions of that article, has access to a review procedure before a court of law or another independent and impartial body provided by law; (ii) the members of the interested public either having a sufficient interest or maintaining impairment of a right; (iii) members of the public for any violation of the national environmental legislation.

Aarhus Directive was adopted considering the Aarhus Convention in order to have consistent provisions with this Convention and to create a single, clear and coherent legislation applicable within the UE.

Aarhus Directive provides the citizens' right to environmental information held or produced by public authorities, including information on the state of the environment, but also on policies or measures taken, or on the state of human health and safety where this can be affected by the state of the environment.

Applicants are entitled to obtain this information within one month of the request and without having to say why they require it. In addition, public authorities are obliged to actively disseminate environmental information in their possession.

4. E-Environment – E-Romania

According to the national strategy e-Romania (GR, 2010), e-Environment is part of this strategy and mainly refers to reduce the vulnerability to natural disasters and to industrial accidents and to fight their consequences.

E-Environment has the following objectives:

- The knowledge of the characteristics and problems of the Romanian environment;
- The knowledge of the system structure which tackles the environment issue (ministry, guard, emergency inspectorates, agencies, research institutions, universities, non-governmental organizations (hereinafter “NGOs”) etc.);
- The knowledge and quick accession of the legal framework in relation to the environment and the sustainable development;
- Analysing and assessing the risk of polluting water, air and soil;
- The prevention and the limitation of the effects caused by natural disasters and industrial accidents;
- Carrying out a georeferential database and integrated informatics systems with high complexity level;
- Providing the knowledge related to Romanian environment on the internet, in order to improve the citizens' life quality by the awareness of risks and also by the citizen's involvement together with the administration in the protection of the environment and life; providing the legislation and European directives in water field on the internet; providing the consultation in relation with the legislation in water field; the disclosure of public data provided by the defense plans against water inundations;
- Drafting and electronic publication, with different access steps (technical/administrative/public), of the defense plans against water inundations, by detailed analysis, assessments of risk to water inundations and related data;
- Providing the access to public information related to the risk management to water inundations, by web instruments;
- Achieving technical electronic libraries related to the water management, exploitation and emergency situations caused by water inundations, drought, accidental pollutions and accidents of hydrotechnical constructions;

- Providing the access to complex data and information related to water management field for experts, consultancy companies, NGOs and other interested institutions, by transposing the data in accessible electronic format and carrying out IT systems for data transfer and electronic payment;
- Providing connections between institutions for transfer of data and administrative documents secured accordingly;
- Carrying out e-Learning facilities within institutions in the environment field.

The main benefits for citizens and administration are:

- The development of a liability culture towards the environment and nature in Romania;
- The clarification of citizens related to the approach of the environment issue at the administration level;
- The clarification of the solutions for the environmental issues faced by a citizen, by providing the environmental legislation which regulates these solutions;
- The knowledge of the citizen's formation possibilities by direct accession of the information provided by the main authorities involved in the environmental issues;
- The provision of an access point to public information in order to find the solutions for the environmental problems faced by a citizen;
- The provision of an access point for notifying the potential environmental problems identified by a citizen;
- The decrease of the risk of polluting water, air and soil;
- The increase of the quality of decisional act in managing the critical situations;
- The provision of main decisional bodies involved in the surveillance of environmental systems, the National Council for Emergency Situations and the General Inspectorate for Emergency Situations, the Ministry of Agriculture, Forests and Rural Development, central and local authorities with attributions in the environmental protection, in case of occurring natural disasters and industrial accidents;
- The improvement of cooperation between institutions and a better public participation in case of managing external events;
- The increase of institutional competence and the preservation of a "technical-administrative memory" of the institutions involved in the water management and the environmental protection in general;
- The optimization of implementing the environmental projects by facilitating the access to environmental data and information.

5. Conclusions

eGovernance will facilitate spreading the good practice and solutions rendered in different similar cases, avoiding some mistakes and even cutting costs.

E-Environment should become a platform where environmental data and information will be combined with knowledge for a decision support of environmental protection and sustainable development

E-Environment may help the liability mechanism by disclosing publicly the measures taken in case of an imminent threat with an environmental damage or after the occurrence of an accident or incident that may produce an environmental damage, in order to avoid its production or to diminish its effects.

E-Environment will optimize the implementation of different environmental projects and will reduce the risks of pollution, as an achievement of both the prevention and precaution principles.

The fundamental orientation of the precaution principle is at first sight enough simple and direct. If an activity threatens the environment or human health, precautions are imposed, even if this threat is not evidenced from the scientific point of view. (Duţu, 2007)

Prevention involves both the risk evaluation to avoid the hazards and the actions based on the knowledge of the present situation, to prevent environmental degradation (Lupan, 2009). This principle supposes actions against the causes that produce pollution or degradation and activities to limit the destructive or noxious effects for the environmental factors (Sadeleer, 1999).

The public cooperation is important in order to promote a project. Prior to the debate of any project, it is essential to present all the benefits and impact of any potential change. E-Environment is a solution to present the initiatives of the government and to interact with the citizens on different environmental issues.

Referring to Romanian authorities with attributions in the environmental issues publish and disseminate on a regular basis, both monthly and yearly local and national reports on the state of the environment, including information on the quality of the environment and information related to the pressures on the environment.

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References

- Convention, (1998), Convention on access to information public participation and decision-making and access to justice in environmental matters, 25.06.1998, Aarhus. It entered into force on 30 October 2001. It was ratified by Romania through Law no.86/2000, published in Romanian Official Gazette, Part I, no.224 as of the 22nd of May 2000.
- EC Directive, (2003), Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313/EEC, Official Journal of the European Communities, L 41/26, 14.02.2003, Brussels, on line at: <http://eur-lex.europa.eu/Notice.do?val=283991:cs&lang=en&list=395212:cs,283991:cs,&pos=2&page=1&nbl=2&pgs=10&hwords=&checktexte=checkbox&visu=#texte>. It was transposed by Romania through Government Resolution no.878/2005, published in Romanian Official Gazette, Part I, no.760 as of the 22nd of August 2005.
- EC Directive, (2003), Directive 2003/35/EC of the European Parliament and of the Council of 26 May 2003 providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC - Statement by the Commission, Official Journal of the European Communities, L 156/17, 25.06.2003, Brussels, on line at: <http://eur-lex.europa.eu/Notice.do?val=285362:cs&lang=en&list=466655:cs,459375:cs,285362:cs,&pos=3&page=1&nbl=3&pgs=10&hwords=&checktexte=checkbox&visu=#texte>. It was transposed by Romania through Government Emergency Ordinance no.152/2005, published in Romanian Official Gazette, Part I, no.1078 as of the 30th of November 2005.
- EC Directive, (2003), Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information, Official Journal of the European Communities, L 345/90, 31.12.2003, Brussels, on line at: <http://eur-lex.europa.eu/Notice.do?val=287372:cs&lang=en&list=608637:cs,608650:cs,511804:cs,287372:cs,&pos=4&page=1&nbl=4&pgs=10&hwords=&checktexte=checkbox&visu=#texte>. It was transposed by Romania through Law no.109/2007, published in Romanian Official Gazette, Part I, no.300 as of the 5th of May 2007.
- EC Directive, (2007), Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community, Official Journal of the European Communities, L 108/1, 25.04.2007, Brussels, on line at: <http://eur-lex.europa.eu/Notice.do?val=447703:cs&lang=en&list=486638:cs,467052:cs,447703:cs,&pos=3&page=1&nbl=3&pgs=10&hwords=&checktexte=checkbox&visu=#texte>. It was transposed by Romania through Government Ordinance no.4/2010, published in Romanian Official Gazette, Part I, no.66 as of the 29th of January 2010.
- European Commission, (2008), The Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: *Towards a Shared Environmental Information System (SEIS)*, 46 final, 01.02.2008, Brussels, on line at: <http://eur-lex.europa.eu/Notice.do?val=464113:cs&lang=en&list=464113:cs,&pos=1&page=1&nbl=1&pgs=10&hwords=&checktexte=checkbox&visu=#texte>
- ECHR, Lopez Ostra v. Spain, December 9, 1994, European Court of Human Rights, (in English), on line at: <http://cmiskp.echr.coe.int/tkp197/view.asp?action=html&documentId=695782&portal=hbkm&source=externalbydocnumber&table=F69A27FD8FB86142BF01C1166DEA398649>.

- ECHR, *Tătar v. Romania*, January 27, 2009, European Court of Human Rights, (in French), on line at: <http://cmiskp.echr.coe.int/tkp197/view.asp?item=1&portal=hbkm&action=html&highlight=Tatar%20%7C%20Romania%20%7C%2067021/01&sessionId=75436135&skin=hudoc-en>.
- Wennerås, P. (2007), *The enforcement of EC environmental law*, Oxford University Press, Oxford, pp 90-91.
- Postiglione, A. (2010), *Global Environmental Governance. The need for an International Environmental Agency and an International Court of the Environment*, Bruylant, Bruxelles, pp 87-88.
- Born, C.-H. (2010), *A status for the associations protecting the environment?* Bodies and instruments of environmental law. Recent developments, future developments, (in French), Anthemis, Belgium, pp 292-330.
- GR (2010), Government Resolution No.195/2010 regarding the approval of the national strategy e-Romania, published in Romanian Official Gazette, Part I, no.276 as of the 28th of April 2010.
- Duţu, M. (2007), *Treaty of environmental law*, (in Romanian), C. H. Beck Publishing House, Bucharest, p 511.
- Lupan, E. (2009), *Treaty on the law of environmental protection*, (in Romanian), C. H. Beck Publishing House, Bucharest, p 565.
- Sadeleer, N. (1999), *The principles of polluter pays, of prevention and of precautionary*. Essay about the creation and the juridical significance of some principles of environmental law (in French), Bruylant Publishing House, Bruxelles, pp 106-135.

Opportunities and Limits of the Application of eGovernment Solutions at Local Level in Romania

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Abstract: The implementation of eGovernment solutions in Romania is a challenge not only for local administrations but for the national government. It is acknowledged that competitiveness in Romania will increase with the development of eGovernment services, especially at the local level. National strategic priorities in the eGovernment field are related to the setting up of the e-Romania project including its eGovernment strategic component, modernization of public administration, the large scale adoption of information technology in relation to the business environment, citizens and public administration, the improvement in the competitiveness of information and communication technology (ICT), research and development and innovation sectors and the implementation of the EU directives related to public electronic services. Despite the fact that there is a national strategy and different large-scale initiatives in the field (most of them in an on-going process of implementation), central public administration has unsuccessfully coordinated the national program for the digitization of local public administration in Romania so far. Nevertheless, through a bottom-up approach, local public administrations have implemented diverse eGovernment solutions in order to improve the lives of their citizens. Such services range from the on-line offering of information, downloading of applications for different public services, on-line registration of complaints and more sophisticated solutions such as on-line payment of local taxes and e-public procurement. Based on an analysis of the projects already implemented, our research will identify limits and opportunities in the application of eGovernment solutions at local level in Romania, building up a set of good practices. Although over recent years Romania has made significant improvements in the development and extension of broadband networks, according to the European statistics (European Commission, 2011; Colclough et al., 2010), Romania still occupies unwanted last place in the level of Internet use by population (up to 35%) and eGovernment use (less than 10%). Romania finds itself below the EU level in relation to the supply of on-line services for citizens (50%) and for companies (75%). Online sophistication of public services reaches 73% of which sophistication for business services stands at 89%, compared to 94% for the EU-27 plus Croatia, Iceland, Norway, Switzerland and Turkey (EU27+). Sophistication for citizen services is at 63% (compared to 87% for the EU27+). Despite the low level of progress, there are prospects for extending and improvement of eGovernment services in Romania, mainly to the use of structural funds which might ensure part of the financing of projects. The negative effects of the economic crisis can be overcome by the increase in the level of computerization in the public administration sector, while decreasing costs involving a human factor following recent cuts in personnel. Having regard to the actual level of development of eGovernment in Romania, the main difficulty would be to integrate local initiatives already implemented with on-going national strategies in the field.

Keywords: Romanian eGovernment, local administration, public services, information technology

1. eGovernment - strategies and programs nationwide

In order to implement the concept of electronic government, a country must have adequate infrastructure for data systems, institutional and technological, a legal framework compatible (for interoperability), properly trained human resources and, last but not least, strategic thinking and coordination.

In Romania, eGovernment is a relatively recent phenomenon. The practice and development of strategies and programs for eGovernment was determined in the first instance by the need to align with EU requirements in the field rather than specific needs identified in Romanian society.

In 2001, the government adopted a first strategy of informatization of public administration (Government of Romania, 2001), introducing the concept of "eGovernment", the objectives of which are: computerization services which benefits citizens and businesses and which involves the integration of services provided by central and local government, the provision of access to information through information technology services to end users of central public administration and the computerization of internal activities and of local government bodies as a means of increasing operational efficiency.

In the same year, access to public information was first regulated in Romania so that information would be provided through websites of public institutions with monthly updates (Law 544/2001).

A flagship initiative was the establishment, in 2003, of the National Electronic System (SEN). The National Electronic System from Romania was launched in September 2003 and is currently the only point of access to public information services and central government institutions, whether of ordinary or legal interest. Available at www.e-guvernare.ro, SEN signified a qualitative progress in implementing eGovernment in Romania.

In recent years, the government has taken important steps not only in relation to computerization, but also in the implementation of an eGovernment line (MCSI, 2011). Some Romanian projects are internationally acclaimed, award-winning and categorized as examples of good practice (Colclough et al., 2010). Mandatory electronic collection of statistical data (e-statistics), an integrated informatic system on-line Visa, computerization of government meetings, electronic information systems and payment of local taxes - eTax, the portal "Virtual counter payment" (www.ghiseul.ro), electronic procurement system (www.e-licitatie.ro), the Educational System-SEI (www.portal.edu.ro), the reification of Romanian Government strategy in the field of information and computer-aided education, are other eGovernment solutions in Romania which are at various stages of adoption and implementation.

Amongst ongoing projects, the electronic system of public acquisitions is the most successful eGovernment project. It is fully functional, accessible to businesses and public institutions and brings annual savings of tens of million of public institutions using it, a performance that won it international recognition in 2003, at the European eGovernment Conference Como, in Italy. The system was named "best practice at European level".

At this point, the national strategic priority in eGovernment is to meet e-Romania service, the strategic component of eGovernment (MCIS, 2011). Romania's national strategy, approved in March 2009 and benefiting from an allocation of nearly half a billion EUR for 2010-2013, is aimed at modernizing the state through computerized interaction with citizens and businesses. The contribution to GDP and the effects of computerization of public services will amount, according to official estimates, to EUR 90 million in 2010, and to EUR 190 million in 2011-2013. E-Romania will allow citizens to address a unified administration, finding answers to all their questions and requests without having to go to any counter.

However, the e-Romania portal launched in 2010, which is in the experimental stage, has made little progress so far. It is intended that this site will be the focus of all electronic services for individuals or companies. The National Electronic System (SEN) will be developed in parallel with the e-Romania portal.

2. Many strategies, limited progress - the status of implementing eGovernment solutions

Despite the numerous existing strategies and financial commitments, and despite pressure from the European Commission, eGovernment in Romania is still a domain in its early stages, which can be concluded from the statistics available.

According to the ninth comparative analysis Report concerning eGovernment (Colclough et al., 2010), Romania is below the European average when it comes to basic public services available online, with a 60% percentage, which puts it in 29th place from the 32 monitored states (UE 27 plus Iceland, Norway, Switzerland, Croatia and Turkey).

Romania has made some progress on information society indicators such as access and availability of broadband Internet. The availability of public services online has increased, but its use by companies is declining and also its use by citizens remains limited. A positive development is e-Procurement which is 1% above average.

At the same time, Romania ranks in last place in all the chapters related to the Digital Agenda of the European Commission (DAE), a strategy to take advantage of the potential offered by the rapid progress of digital technologies. The DAE is part of the overall Europe 2020 strategy for smart, sustainable and inclusive growth.

The DAE provides, among its objectives, that at least half of EU households are connected to broadband networks by 2020. According to the scoreboard of the Digital Agenda (European

Commission, 2011), Romania ranks in place among European countries, having regard to broadband penetration rate and population familiar with the technology and use of e-governance (less than 10% of the population). 70% of Europeans use the internet daily, compared to only 34% of Romanians, while 57% of Romanians have never used the internet. The European average for those who do not use the Internet is only of 26%.

Moreover, in the 2010 United Nations report on eGovernment (United Nations 2010), Romania is in an unenviable position: 47th place in development of eGovernment solutions, 42nd in development of online services line, 58th in terms of telecommunications infrastructure and 46th in terms of human capital. In terms of e-participation, Romania ranks 64, followed, among the member states of the European Union, only by Luxembourg, the Czech Republic and Slovakia.

A general assessment of the level achieved in implementing electronic government in the central government of Romania allows us to say that the state of electronic services of its administration is not advanced; being distant from what would ensure minimum support for desired operations. Redundancy, onset projects, strategies that implemented or changed on the wing are elements that characterize at present what is generically called eGovernment in Romania. For the Romanian administration at present, development and unification of electronic services is a very distant goal.

3. Local government, between national solutions and autonomous eGovernment initiatives

The high institutional level of local public administration (county councils, mayors of large cities etc.) have begun to develop autonomous initiatives of eGovernment. Smaller local communities, that lack technical and economic abilities and human resources, have used the national and European initiatives and programs in order to profit from the possibilities and opportunities offered by eGovernment with the purpose of achieving and developing an enabling environment for electronic government services.

In 2007, less than 50% of the territorial administrative units reported their own website to facilitate access to new technologies and to the internet for public administration authorities. In that year, the Ministry of Communications and Information Society (MCIS) launched the portal <http://eadministratie.mcti.ro>. This E-administration project aims at reducing disparities amongst communities generally both small and large in the use of information technology by facilitating access to new technologies for local authorities in communes and small towns.

This project is concerned with developing a software that allows municipalities with insufficient resources to create their own web portal so that citizens can interact with local authorities, offering electronic services that are available in real time and providing opportunities that business offers in order to attract investment or to interact with other institutions.

In addition to this initiative, the "Guidelines on the implementation of web pages for the authorities and central government and local institutions in Romania" was launched in 2008. The document proposes improvements to websites of government in terms of format, content, and proper and uniform development of access to web pages in accordance with European standards.

Another successful project of the MCIS, which is considered an example of good practice in public administration in Romania (Colclough et al., 2010) and with results in demonstrated efficiency and innovative disseminated practices is the project "Knowledge Based Economy". Developed as a result of a loan worth 60 million American dollars from the World Bank, with contribution by the Romanian Government, of 9.4 million American dollars, the project, which took place between 2006 and 2010, addressed rural and small areas (towns with populations with less than 30,000 inhabitants), where there is no access to digital information and, therefore, no skills to use and operate it. The project envisaged 10% computerization in rural areas of Romania, including approximately 250 mayors' offices, 250 public library locations, 250 points of public access to information and 502 secondary schools, all equipped with latest information and communications technology (ICT), connected to Internet Broadband fiber optics and wireless solutions.

In addition to an increase of 10% in the total population with access to computer use and an increase of 11% in internet use the catching effect that this project has created is even more important.

Selected local achievements in the project have become examples of good practice for communities that have benefited from it.

In relation to autonomous eGovernment initiatives with small steps, from their own funds or from the European Union, local governments of large cities or those at county level have implemented various solutions to improve the quality of life of their citizens. First, among the most requested electronic services to citizens, is payment of taxes online by credit card. From this point of view, the progress that has been made in local government is remarkable. Currently, over 20 municipalities have implemented online payment card charges and taxes, twice more than in 2010. In the first half of 2011, online transactions for payment of taxes represented 16% of total transactions. For instance, citizens of Alba Iulia have easy access to personal or general information and can track the online route of documents submitted, certificates of urbanism, permits and approvals and the implementation by the mayor of a project totalling over RON 2.3 million. The City Hall of Alba Iulia is among the few in the country that provides its residents with a portal that acts as single point of access through which citizens can see at any time the status of taxes, the status of an application to the institution, track assets held and pay via the Internet using credit cards outstanding rents, royalties, licence fees, fines or other charges. The project "Braşov City Hall just a click away" enables Braşov citizens to use a range of public e-services. Three components of the project have been offered to citizens and businesses since the 4th of August 2011: a call centre system; web portal services and electronic payment. Braşov citizens are able to pay local taxes, rent, fees, fines, document issuance fees and other fees for services provided by the City Hall online by credit card on a 24-hour basis. Citizens can submit online documentation for permits and certificates, as well as check the progress of applications submitted to City Hall. The call centre is available to citizens on a 24/7 basis and automatically responds to the first 20 simultaneous phone calls by citizens.

Despite these achievements, recent studies on the development of local eGovernment in Romania (Stefan, 2007; Stoica and Ilaş, 2009; Sabau, 2009; Vrabie, 2011) show that, in terms of eGovernment, local communities are still quite heterogeneous and their development is currently uneven. According to these studies, a few municipalities in Romania have a web site developed enough to pass the first two stages of development of e-governance in accordance with the United Nations model (United Nations, 2008). Most local communities are limited to providing a minimum of information on the organization and the functioning of the institution, so as to provide online publicly, more or less regularly, activity reports and decisions made by the local council, to provide citizens with electronic information on current activities of the institution and, possibly, to provide forms for downloading (without being present, in most cases, the electronic submission of applications). Information web pages of local public institutions are mostly operational but not constructed in accordance with a common set of standards or requirements which allow integration into a single portal, so as to ensure optimal conditions for access to information of public interest.

The provided services are sparse, mainly because there is no city where utility bills can be paid using the City Hall official webpage as a portal. Citizens do not have many opportunities to voice their opinion regarding the way the community is run. Less than 10% of the city hall websites have online opinion polls and none of them offer the possibility of organising a digital referendum or an online petition (Stoica and Ilaş 2009).

4. Limits on implementing e-governance at local level

According to international studies on electronic governance (Lam, 2005; Carter and Bélanger, 2005; Shin 2008), barriers to implementing eGovernment solutions are both technical and non-technical, the overwhelming majority of them considering the people, processes and organizations rather than the technological factors. An analysis of success factors of eGovernment in developing countries, (Shin, 2008) has identified 6 success factors: changes in work process, technical/human resources, organizational culture/values, vision/strategy/internal leadership, external/financial support and laws/regulations/policies.

There are, therefore, many factors that can lead to failures of eGovernment projects – the resistance to change within government structures, the technical barriers, the lack of training in ICT for civil servants etc.

The issue of eGovernment development in local public administration in Romania involves multiple compliance which requires an integrated approach. The factors determining the development of

eGovernment are related both to the institutions that should make eGovernment available and to the services and to the recipients of these services, namely the people, who have the skills necessary to access it, but also to the infrastructure necessary to provide these services.

In terms of public administration, the development of eGovernment solutions at local level depends on the financial, technical and human resources that a local authority is prepared to deploy, but more especially it depends on the existence of political and administrative leadership that believes in it.

Despite continued price cutback to electronic equipment, the lack of financial resources, especially amid budget austerity in recent years due to the economic crisis, it continues to be, in our opinion, a major cause of limited development of eGovernment solutions at local level. Greater polarization amongst local communities in Romania, in terms of financial resources, makes poor communities often focus on socio-economic projects, that is, on problems the solution to which is absolutely imperative so that computerization of their business is left second, that is, projects in this sense are treated as a burden.

Regarding human resources, although in recent years many programs have been developed to increase the digital literacy of civil servants, many officials still have no knowledge of the eGovernment system, available technology is quite old and the understanding of its use is poor.

Traditional Workflow for each job and post in public administration is structured and most officials prefer to use traditional ways of working on the basis that e-governance is the prerogative of specialists in computer science.

Among employees in IT departments in public administration there are too few specialists because of low salaries, in comparison with the private sector. In general, people in those departments deal with the current management system as supporters of public service.

In the public sector in Romania, the position of Chief Information Officer (CIO) does not exist and IT department managers do things that normally a CIO should not do, for example, management of the network, the majority being involved in strategic decisions of the institution. Every time organization changes, everything that was done by staff with years of experience is deleted and new ideas are introduced, which are not always good for the computer system.

Resistance to change in public institutions is considerable and public servants and the leadership of these institutions generally are very reticent towards initiatives in the eGovernment area which implies, in many cases, a rethinking of processes at the institution level, creating new roles, redefining responsibilities and a widening of tasks, namely, those which actually affect the functioning of the organization.

At the same time, adopting most of the solutions for e-governing in Romania at a central level has rendered them in comprehensible to the institutions that should manage and benefit from them, knowing that the initiatives that come from public authorities and that are supported by the political will are most likely to succeed. For instance, the implementation of one of the most sophisticated services that operates at local government level in Romania, the online payment of taxes, was put into practice less because of the identification of local needs and to assist citizens, than to meet an obligation established by a legislative act.

eGovernment systems developed by local governments have assumed, in many cases, the copying of similar systems of other authorities, providing, most often, generic solutions, unsuitable to local conditions, to the needs of the citizens and to the respective institutional structure. Traditionalism in the provision and use of government services, a traditionalism that characterizes public administration but also its beneficiaries, is, therefore, an important limit upon the development of eGovernment solutions at local government level in Romania. At this point, any business or civil society in Romania does not exert an influence great enough to shift from traditional government to electronic government. This is also due to the digital gap that divides Romania from most other European Union member states. Thus, in 2010, in 48% of Romanian households there were no computers and more than half of Romanians never used the internet. In addition, the process of developing eGovernment solutions does not always match a national vision centred on the needs of the citizen. According to official data, in 2000-2008, EUR 6 billion was invested in Romania in the area of electronic public

administration for citizens, but the benefit of this investment was small as less than 10% of the population used eGovernment systems. The government strategy to invest in grandiose projects meant that potential users had neither equipment nor the skills to use eGovernment tools. It was proved to be the wrong approach, an approach from which lessons must be learned for the future. At the same time, two systemic barriers may occur in the path of effective implementation of eGovernment in Romania: the lack of coordination at central and local levels and the lack of systems interoperability.

All eGovernment solutions which are implemented must be embedded in a unit system with appropriate links and connections to achieve compatibility of collaboration and information processing, relating to their transfer both within the same institution, between central and local authorities and at local level between local municipalities and other public institutions, between area institutions and similar ones from other areas. Considering the actual level of development of eGovernment in Romania, the main difficulty will be to integrate local initiatives already implemented with on-going national strategies in the field.

Finally, the abundance and complexity of legal regulations, and especially current requirements in protecting citizens' privacy and data security, can be barriers to implementing e-Governance.

5. Opportunities for developing local eGovernment

The list (which is not far from exhaustive) of barriers to development of e-governance at local level in Romania is long, but Romanian society can identify a number of opportunities that allow us to appreciate that in the future things can change.

Thus, in terms of lack of financial resources, the main solution is to access European funds, when there is a line of funding committed to developing eGovernment solutions - Increase of Economic Competitiveness Operational Programme, Key Area of Intervention 2 (Development and Increasing efficiency of modern electronic public services) and Operation 3.2.1. There is a need to support the implementation of eGovernment solutions and provision of broadband connection, where necessary. Although the number of projects financed under this structural instrument is not very large and in the two sessions for submission of projects in 2008 and 2009 the given budget was exhausted, the results of the implementation of these projects will be seen in the future. Projects from call 2008 (15 in number) have already been allocated funds worth over 20 million.

Another opportunity to overcome the barrier of the lack of financial resources is to promote public-private partnership and / or computer services outsourcing solutions. Establishing a broad partnership with the private sector, with NGOs, academics and international agencies, especially in information technology and communications and e-literacy can contribute to successful implementation of e-governance. Involvement of many interested parties in all areas is a must and local government should implement a set of applications truly useful to citizens and that also generate sensitive savings so that this system can develop gradually with the help of the private sector.

Although not yet very large at the local authorities level in Romania, the public-private partnership in the Public Sector ICT boasts several successful experiences. Thus, EuDiS, the public-private partnership between the company CG & GC and the local government of Mehedinți was the first public private partnership in the ICT & C- Public Sector, type DBO (design, build and operate) that proposed an approach at county level of the computerization process of local government, proposing a complete computerization of a county, with all the integrated components and interaction among themselves and thus the solution of different communication problems in each location.

To streamline public administration a big package ICT solution was proposed at the county level, from hardware, communications, basic software to computerized administration of taxes, budgets and informing citizens. To this was added the training of users of the applications. This project is offered today in the franchise system to other local governments too.

A public private partnership in the ICT sector with the Public Sector, a BOT (build, operate, transfer) was developed at the Argeș's county level government. In conditions under which more and more counties apply the public-private partnership approach to implement the business integrated information systems, we can hope that interoperability can become a characteristic of local public administrators' systems.

Last but not least, and perhaps the most important way to overcome the current difficulties with the development of eGovernment in Romania is the continued investment in education (especially IT). Investments results in this direction from the last 10 years should be seen quite soon. According to GD 1007/2001, completed with Ministry of Public Administration's Order no. 252/2003 for approving the Methodological Norms on the training and specialization in computer science of the civil servants, the European Computer Driving Licence standard is to be used in the primary training. Thousands of civil servants in recent years have obtained the European Computer Driving Licence (ECDL) in the 600 existing centres nationwide.

The Ministry for Education, Research and Innovation follows through its programmes the use on a large scale of information technology in the process of education, constantly initiating programmes of supplying IT instruments for education institutions, correlated with the introduction of assisted instruction on the computer. According to the government decision no. 97/2009, it is introduced within the exams for Bachelor the evaluation of digital competences. "The results of the evaluation are expressed through the level of competence in relation to the European standards acknowledged in the field."

Also, in each university program at least one IT course is offered. Future generations of civil servants will feel more comfortable to collaborate online to solve problems than previous generations, who are often employees with management positions today. Equally, those who will interact with the administration will have better knowledge of IT.

It might be thought, in perspective, even the incorporating of some possible applications of e-governance, both in higher education and in the high school. Ensuring the availability of services and educational resources on the Internet, along with increased the use of Internet and with equipment of educational institutions with computers, will generate a workforce better prepared, more flexible and more willing to support the development of innovative solutions of government. At the same time, local citizens belonging to local collectivities should be made aware of the electronic services offered by the administration and they should be taught to use them, not simply expect the change of generations.

6. Conclusions

For local government in Romania, the implementation of electronic government solutions has proved to be one of the main factors of change in recent years. Switching to electronic interaction has involved major changes to the internal working of public administration, adapting work methods, including partnerships with the private sector and with civil society. EGovernment services have come to represent one of the most effective means of fighting corruption, a key factor regulating institutional transparency and credible business environment in Romania, leading to better quality of information, a reduction in time for dissemination and a significant reduction in administrative costs.

Although still at the beginning, results have shown in recent years some progress towards the implementation of ICT and satisfying the concerns of local government to bring decisions closer to citizens.

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References

- Carter, L. and Bélanger, F. (2005) "The utilization of eGovernment services: citizen trust, innovation and acceptance factors", *Information Systems Journal*, vol. 15, no. 1, pp 5-25.
- Colclough, G., Tinholt, D. and Lörinz B. (2010) "Digitizing Public Services in Europe: Putting ambition into action, 9th Benchmark Measurement", [online], Capgemini worldwide, <http://www.capgemini.com/insights-and-resources/by-publication/2010-egovernment-benchmark/>, (accessed on 08.01.2012).
- European Commission (2011), Commission staff working paper "Digital Agenda Scoreboard", Brussels, 31.5.2011, SEC(2011) 708, [online], http://ec.europa.eu/information_society/digital-agenda/scoreboard/index_en.htm, (accessed on 08.01.2012).
- Government of Romania (2001) "The strategy regarding the informatisation of the public administration", [online], http://www.gov.ro/strategia-guvernului-privind-informatizarea-administratiei-publice__11a100007.html, (accessed on 08.01.2012).
- Lam, W. (2005) "Barriers to eGovernment integration", *Journal of Enterprise Information Management*, 18, 511-530.

- Ministry of Communications and Information Society (MCSI) (2011), *Progress Report for 2008-2010*, [online], <http://www.mcsi.ro/Minister/Anunturi/Raportul-de-activitate-al-MCSI>, (accessed on 08.01.2012).
- Sabău, D. (2009) "EGovernment in Romanian Municipalities", *Transylvanian Review of Administrative Science*, Issue 2 (24), pp. 110-123
- Shin, S. , Song, H. and Kang, M. (2008) "Implementing EGovernment in Developing Countries: Its Unique and Common Success Factors", Paper presented at the annual meeting of the APSA 2008 Annual Meeting, Hynes Convention Center, Boston, Massachusetts, [online], http://www.allacademic.com/meta/p280176_index.html, (accessed on 09.01.2012)
- Ștefan, G. I. (2007), "Quality evaluation of the Romanian City Halls Web Sites", *Theoretical and Empirical Researches in Urban Management*, Year 2, Number 2, pp. 30-55
- Stoica, V. and Ilas, A. (2009) "Romanian Urban eGovernment. Digital Services and Digital Democracy in 165 Cities", *Electronic Journal of eGovernment*, Volume 7, Issue 2, (pp. 171 - 182), [online], www.ejeg.com, (accessed on 09.01.2012)
- United Nations Department of Economic and Social Affairs (2008), *UN EGovernment Survey 2008 - From EGovernment to Connected Governance*, United Nations, New York, [online], <http://unpan1.un.org/intradoc/groups/public/documents/un/unpan028607.pdf>, (accessed on 09.01.2012)
- United Nations Department of Economic and Social Affairs (2010), *Leveraging eGovernment at a time of financial and economic crisis*, United Nations, New York, [online], <http://unpan1.un.org/intradoc/groups/public/documents/un-dpadm/unpan038853.pdf>, (accessed on 09.01.2012)
- Vrabie, C. (2011), "Digital Governance (in Romanian Municipalities). A longitudinal assessment of Municipal Websites in Romania", Paper read at 6th International Conference on European Integration - Realities and Perspectives, Danubius University of Galati

e-Strategies to Break the Digital Divide in Various European Countries: A Comparative Perspective¹

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Abstract: The achievement of a knowledge society based on the expansion of digital technologies is a goal shared by governments, institutions and civil organizations in large parts of the world. The digital divide is a barrier to achieving this goal because it expresses the inability to access, in their various forms, the benefits provided by information and communication technology and, ultimately, to access digital citizenship. The scope of the digital divide is significant between developing and developed economies, but also in areas with developed economies, as in the case of the European Union, where there is great diversity among the member countries. In the current global economic crisis, and specifically in Europe, some governments have promoted the idea that ICT is a strategic sector for growth and job creation –as stated by the EU Ministers responsible for the information society in the Granada Declaration of 19 April 2010. Following this guideline, Europe would reach a high level in the global digital economy, especially as regards the information technologies' market. At the same time, there is an inclusive policy aimed at a new European citizenship, in other words digitally prepared and active users. Consequently and according to these principles, governments should commit more to this sector, extending its use and benefits to the general population, in order to improve both individual and collective life. However, despite these general guidelines, not all countries have addressed digital inclusion equally in both content and scope. Through this paper we aim to provide a comparative analysis of some of these e-inclusive strategies.

Keywords: digital divide, digital inclusion, digital citizenship, e-inclusion policies

1. Digital inclusion and e-inclusion: Access and use of the ICTs

The digital divide is generally considered as a problem which affects a number of people who do not use the information and communication technologies (hereinafter the ICTs) throughout the world, both between countries and within the countries themselves, whether they are developed or developing countries. Apart from being a problem of use which affects different social groups, the digital divide highlights a problem of access for those people who lack an opportunities structure within the scope of the ICTs whereby their participation is limited in the different labour, social, political and cultural spheres which constitute the mechanisms for full social integration. Thus, the OECD (2001: 4) defines the digital divide as «a term that refers to the gap that exists in the opportunities to access advanced information and communication technologies between geographic areas or by individuals at different socio-economic levels.»

Norris (2001: 4) on the other hand considers three aspects which constitute this phenomenon: the *global divide* which refers to the difference in Internet access between industrialised societies and developing societies; the *social divide* which refers to the gap between rich and poor in information in each nation; and finally, the *democratic divide* which means the difference between those who use and those who do not use the panoply of digital resources to engage, mobilize, and participate in public life. There are however many other dimensions «that imply that it is not money and technology that matter but the right approach, and unless the other divides are also addressed, crossing the digital bridge will not achieve much» (Harris 2004: 11-12). Clement and Shade (2000) have also described the dimensions of the digital divide under what they call the «The access rainbow», conceptualizing universal access to the information/communication infrastructure which means: Carriage – the infrastructure for transporting the data; Devices – the computers and other devices used by the individual; Software Tools – the browser, emailer and other software needed to use the Internet; Content/Services – online databases and website repositories of information; email and e-commerce services; Service/Access Provision – local ISPs and community access points; Literacy/

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Social Facilitation – text and computer literacy; training and support services; Governance – public consultation on policy issues; social impact assessments.

Restrictively, as regards two of the dimensions of the digital divide mentioned above, *digital inclusion* has been considered as «technological literacy and the ability to access relevant online content and services» (Crandall and Fisher 2009: vii).

Another way of understanding the digital divide consists in limiting it to a consequence of the lack of Universal Internet Access and the right to access information (Maxwell 2000), which is covered in UNESCO's *Recommendation concerning the Promotion and Use of Multilingualism and Universal Access to Cyberspace* (2003). Other authors like Mossberger *et al.* (2008:1) go even further and tackle «the ability to participate in society online» as a problem of «digital citizenship».

Access to the ICTs is therefore a prior and necessary condition in order to resolve many of the problems surrounding the digital divide and stresses the electronic e-Inclusion mechanisms and strategies (see Codagnone 2009: 8)² which the states offer in order to provide the population with digital inclusion. And ultimately the development of the rights which favour digital citizenship.

As such, the concept of digital citizenship acquires full meaning in the Internet era insofar as it refers to the participation in mechanisms and structures of electronic governance, considering as such a series of new channels which result in electronic administration, electronic services and electronic participation (see UNDP 2011), so that the citizens can take part in the public political issues which were until now exclusively within the domain of governmental institutions. The issue concerning to what extent and in what way the different European governments have dealt with the issue of access to the ICTs and, specifically, to the Internet, through e-Strategies, is from our perspective relevant given that it allows for a comparative consideration of the degree and level of effort of the different countries in reducing the gap deriving from the digital divide. This comparison required the application of a qualitative methodology and Content Analysis of the chosen e-Strategy texts. The following sections are devoted to showing the main results of this comparative analysis.

2. Internet access and use: Institutional approach in the EU

The Internet access and use indicators show the real degree of Internet penetration in our daily lives (private, public, business, etc.). As regards *access*, we have focused on issues like investments in infrastructure, the real possibilities of having available the adequate technologies and resources to be able to connect to the Internet (ease of acquiring computers or accessing public electronic access points, etc.).

In terms of Internet use, however, we indicate those issues which are related to Internet's real penetration in the population (according to gender, age, studies, etc.), purpose of Internet use, and programmes for specific digitally-excluded groups (the disabled, the elderly, people with few resources, etc.).

These points have already been studied within the European Union's Information Society Policy (Criado 2009). We find a reference to this in the different EU Ministerial declarations on the issue. We are going to refer to these below, summarising where they focus their attention and which to a certain degree show the sequence over time (in periods) of the evolution of this issue in the EU.³

The first feature to stress in relation to access, and looking at these 5 reference documents, is that there is a clear evolution with reference to both more generic approaches (Riga: extending Internet to all of the regions, using structural funds to create electronic access points, information and communication technologies for all, etc.), and more concrete specifications like in the Granada Declaration (100% broadband cover, ultra-high speed networks, development of wireless digital services, etc.). More specifically, while in the *2006 Riga Declaration* the emphasis was placed on

² According to this author it is necessary to differentiate e-Inclusion from digital inclusion. Hence: «It is also important to clarify that the term “e-Inclusion” refers to policies and supporting initiatives and measures. On the contrary the expression “Digital Inclusion” is used when discussing and describing the existing situation and the various socio- digital economic causes and processes shaping whether individuals or social groups have inequalities access to, or make us of, ICT. In this context, alongside digital inclusion, its opposite “digital exclusion” is also used, as well as the expression “digital inequalities” » (ibid., p. 8).

³ From the 2006 Riga Declaration, to that of Lisbon (2007), Vienna (2008), Malmö (2009) and finally the 2010 Granada Declaration with the European Digital Agenda.

making Internet reach all of the regions (geographic digital gap), establishing points of public Internet access (resources gap) and for all types of citizens (also those who are disabled), the *Lisbon Declaration* (2007) is more vague on this matter and only commits to international cooperation in reducing the digital gap. Afterwards, the *Vienna Declaration* (2008) commits to broadband as a right, issues relating to the simplicity of use and achieving progress on the issue of standardisation. This issue was then tackled in the *Malmö Declaration* (2009) as a commitment to the open specifications and to interoperability. Finally, the European Digital Agenda (declared in *Granada* in 2010), resolutely committed to 100% broadband cover, ultra-high speed networks and development of the networks of the future, and wireless digital services.

This shows that there is progress towards more powerful and faster connection systems which reach practically the entire population, and which comply with the optimum interoperability requirements.

As regards the *use*, in the *Riga Declaration* the stress is placed on the issues of regulation and interoperability, the policies for the provision of online services and generally extending the electronic format. It is in the *Vienna Declaration* (2008) when the formulation appears more clearly on the need to prevent the gap between the access and the use of the ICTs. However, it is with the *Malmö Declaration* (2009) and with the 2011 European Digital Agenda 2011 (*Granada* 2010) when these actions are specified. Through the *Malmö Declaration* (2009) the focus is placed on issues which now involve a more highly developed e-government such as: the issues relating to the reuse of the information in the public sector (very much in keeping with the simplification of processes), developing cross-border services, the protection of the electronic identity, the exchange of experiences between public employees, companies and the citizens, and, of course, the interoperability.

The European Digital Agenda (*Granada* 2010) continues to go into greater detail on these issues (principally data reuse and protection), and other issues are strengthened like e-commerce, data protection in sensitive areas like health and also new advances like “cloud computing” and the Charter of Digital Rights. This last topic seems to us to be of particular interest insofar as it involves a clear extension of people’s citizens’ rights. (Marshall 1998). But for this to happen, all of the individuals must be able to access it. This is the central focus of our study.

3. Comparative e-strategies in certain selected European countries

Based on the key issues which are contained in the different EU Ministerial declarations in recent years – already mentioned in the previous section – we shall look at how they are reflected in some of the e-government strategies in some European countries. Given that- due to the obvious limitations of this work – we cannot cover all of the countries in the EU, we have selected four countries taking as a reference the Welfare State models prepared by Esping-Andersen (1990). Hence, Great Britain responds to the Liberal model, Sweden to the Social-Democratic model, Germany to the Corporatist model and Spain to the Mediterranean model. We know that the cases selected do not represent the pure models with which we identify them, but we consider that due to their characteristics they are the closest to them. This comparison, on the other hand, does allow us to distinguish whether there are specific e-strategy approaches depending on the type of economy in question. It should be remembered that the development of the Information Society requires a significant initial financial investment (infrastructures, etc.) by both the public and the private sector. As such the respective starting point will influence the decisions which are taken on the subject (see reference)

All of the plans and strategies do not coincide as far as the same date of publication but the time difference is not significant for the purposes of this paper. Broadly speaking, Sweden is focused on extending broadband, Britain on connectivity for all, and one could also say that it is the one which shows more concern for digital exclusion and the groups in such a situation. The German model would be a combination of the Swedish and the British models insofar as it is concerned about extending broadband but also includes references to specific programmes for women, the elderly and the disabled. Finally, the Spanish model is a project with a wider variety of stated fields of action. On the one hand, it continues advocating the extension of the telecommunication networks, promoting the ICTs as an up-and-coming economic sector, but it also highlights the public sphere (a “paperless administration”) and the increase in the use of Internet amongst the population through the extension of a culture of Internet security and the advantages of its use.

First of all we shall look at the issues relating to the *infrastructure* for accessing Internet and the evaluations and forecasts contained in each national strategy. On this matter, out of all of the

strategies Sweden stands out due to the fact that the entire report concerns broadband and its possibilities for extension, starting from and considering the fact that Sweden occupies a very high position in the provision of broadband to the citizens. This could be surprising given that the emphasis is placed on an issue where they are leaders in broadband infrastructure.

In the case of Sweden, 91% of the households have access to the Internet and 86% have access via broadband (EUROSTAT 2011). This gap is higher than in the case of Spain (64% and 62% respectively). It is important that the broadband is extended (case of Spain), but it is also important (and should even take priority) that the largest possible percentage of households are connected to the Internet, regardless of whether it is via broadband (case of Sweden) or not. In other words, in Sweden there are more people who connect to Internet than in Spain, although those who do connect in Spain do so via broadband.

Table 1: Households with Internet access and broadband connections (%)

Country	% Internet access	% Broadband connection
EU27	73	68
Germany	83	78
Spain	64	62
Sweden	91	86
United Kingdom	85	83

Source: EUROSTAT (2011).

In the British case they have an Internet penetration rate of 85% of the households, greater than in Spain (64%) and comparable to that in Germany (83%), and below that in Sweden (91%) (ibid.). The British e-Strategy places a lot of emphasis on the creation of public electronic access points to reach all of the rural areas.

In the expansion of the broadband what we notice is that both Great Britain and Sweden resort to specific bodies for its promotion. For example the *National Rail Administration* and the *Broadband Forum for collaboration and dialogue in Sweden*, and the *Broadband Stakeholder Group* in Great Britain.

In the Spanish case (Secretaría de Estado de Telecomunicaciones y para la Sociedad de la Información. Gobierno de España, 2010), it cites as an important landmark the fact of having achieved large expansion in mobile broadband (32.1% of the population as opposed to the EU average of 23.7%). Furthermore, 97% of Spanish companies (without indicating the size) are connected to Internet via broadband, which places it in top position together with France and Malta.

As concerns specific programmes for e-excluded groups, the United Kingdom again stands out from the four cases being studied. Strategies are considered for the provision of services (mainly regarding health) (Ferguson 2005). They also place much emphasis on the network of online access centres and even show some data resulting from an evaluation of their functioning. Basically all of the users felt more secure with the ICT after visiting said centres and 84% said that they had acquired certain skills which they would otherwise not have acquired. Since April 2003 the company *Ufi/learn direct* has been entrusted with managing the online centres and is in charge of finding finance for them. Other measures include facilities for acquiring a computer and also programmes for access by the disabled.

In the case of Germany, the specific e-inclusion programmes for specific groups mainly refer to young people, women, the elderly and the disabled and to combinations of factors which relate these types of groups with others (immigrants, people with few resources). In the Spanish case, the strategic lines focus the attention on institutional parameters ("paperless administrations"), infrastructure and the economic environment, and also on increasing the trust in the extension of the Internet culture amongst the population, but do not specify concrete actions aimed at certain groups. Finally on this issue, the Swedish case cites the disabled as a specific target group of a certain type of broadband extension (for example video telephone for the deaf).

Insofar as the *use* is concerned, we do not have user profile data but we do have some significant statistics on this issue. In all of the countries analysed, the percentage of subscribers to mobile and landline telephony is very high. In relation to mobile telephony it reaches 100% of the population in the United Kingdom, 99% in Spain and Germany and 98% in Sweden. It could be said that practically the entire population access this type of technology. As regards Internet users (EUROSTAT 2011), Spain (64% of the households) falls behind the other countries analysed (Sweden 91%, United Kingdom 85% and Germany 83%). Distinguishing the broadband Internet subscribers, in Sweden there are 86 %, in the United Kingdom 83%, Germany 78% and in Spain 62%. Here the distance between Sweden and the others is very clear. In fact we have stressed the pre-eminence given to broadband in the Swedish strategy.

Another important detail is the number of personal computers per 100 inhabitants. Here again the cases of Sweden (87.8%) and the United Kingdom (80.2%) stand out, followed by Germany (65.5%) and finally Spain in fourth place with 40% (UNDP 2010). In relation to the cost of telephony in general, the United Kingdom comes first, followed by Germany, Spain and finally Sweden. As regards the cost of the broadband (OECD, 2010)– a more significant detail for our purposes – the minimum speed in Spain doubles the price in any of the other three (44.48 USD for Spain, 21.34 USD for Sweden, 22.46 USD for the United Kingdom and 23.44 USD for Germany).

We see that Sweden does not only stand out due to the enormous progress in developing the Information Society, but has also managed to achieve a “sustainable” development as their use does not involve high costs for its citizens. We could even establish a certain hierarchy between the different countries based on the presented statistics. Thus, as regards ICT expansion and penetration amongst the population, Sweden would come top, followed by the United Kingdom, then Germany and finally Spain.

Another interesting detail which completes the notion of Internet penetration is knowing what percentage of the population (individuals aged 16-74) states that they have never used Internet in their life. On this matter, and using data from 2011 EUROSTAT (2011), the case of Sweden is striking which shows that only 5% of the population has never used Internet, followed by the United Kingdom with 11%, Germany with 16% and Spain with the highest percentage of 29%. This indicates to us the margin of e-exclusion which we are referring to in each case (very high in the case of Spain). As e-government indicators, the Eurostat provides figures relating to the use of Internet to obtain information from official websites as well as a step further in the degree of sophistication of the electronic public services measured by the percentage of the Internet user population which has completed official forms via this resource. In the first case (obtaining information) the positions are reversed between the studied countries. Sweden continues coming first (74% of the Internet users) but now followed by Germany (59%), Spain (54%) and the United Kingdom (32%). It is striking that the British, although the majority are connected to the Internet (85% of the households), are not likely to connect to the official public pages. And the positions change again if we now look at the percentage of the population which uses the Internet and fills out official forms online. Sweden continues coming first (44%), followed by Great Britain (27%) and Spain (26%), and in last place Germany (19%). In all cases this practice is low as we have already cited elsewhere (Martínez Monje y Mesa 2010). These figures show the gap between the possibilities of Internet access amongst the population and the extension of e-government. This data is curious given the fact that – with the exception of Spain – the online commercial transaction figures are high (82% in the United Kingdom, 77% in Germany and 75% in Sweden).

Curiously in this case Sweden does not stand out. The case of the United Kingdom is very significant as there is a big difference between those who purchase on the Internet and those who use it to communicate/transact with the Administration. Could there be a lack of interest in this case? The Spanish case is also exceptional because the percentage of Internet purchase amongst the users of this technology is very low compared to the rest (although it is similar in the case of consultation and transaction via the official websites). Here again there could be different hypotheses, one of which could be that in the Spanish case there is still a lack of understanding about the culture of secure Internet browsing.

Revising the references to the digital divide factors like gender, the elderly and the disabled (Crandall and Fisher 2009; Castaño et al 2009; Robles et al 2010) we find that in the case of Spain two or three generic references are introduced to issues of gender, as issues to be dealt with within the global

consideration of the digital divide. No specific reference to gender in the cases of the United Kingdom and Sweden, although the German strategy, on the other hand, dedicates a lot of attention to this point. And the same happens if we look at references to the elderly or the disabled.

Regarding the economic models which represent each of these countries and their possible influence on the development of information society policies, we can only set out some hypotheses to be studied by later research work. We have seen how the Swedish model is the most Universalist, placing greater emphasis on Internet as a citizen right and on the issue of greater human development. In the United Kingdom, on the other hand, it is more orientated towards the provision of services, mainly of a commercial nature (e-business), along Liberal lines of business opportunity. This explains the distance between the massive use of Internet for online purchase while the use of e-government (both information and transaction) is reduced to a third of the Internet users. The German case is close to this model but with its own special features. Here again there is significant market orientation but linked, on the other hand, to employment and to opportunities in the work market. Germany, as a Corporatist model, is more concerned about the different groups affected by the digital gap and seeks to provide specific measures for them, but also however has low levels of e-government as regards the transactions between the citizens and the public sector. Finally, the Spanish case has strong investment in infrastructure with limited social projection, due – amongst other reasons – to their high cost (the most expensive broadband in Europe) (OECD 2010). In short, large investments for a very limited use (scarce) of the electronic public services and also of electronic commerce. Spain is an exponent of the residual model (Esping-Andersen 1990), leaving in the hands of the families a very significant weight (expense) of the possibility of accessing Internet.

We could therefore ask ourselves whether the European information society framework is focusing the attention on high impact issues (to justify the e-policies themselves?) aimed at issues like broadband, the online market, technological access (in other words, global divide, according to Norris (2001); while the *social divide* and the *democratic divide* is not only not being reduced but is in fact broadening on a daily basis (even exponentially), given that there are no specific policies aimed at these objectives.

4. Final assessment

The different statistics available on Internet use show that there is still a significant difference in the percentage of homes with Internet amongst the countries of the European Union. The digital gap continues being an issue which resides in the extension of Internet use amongst the population, but as a cyber-culture is introduced amongst the population, the access to the ICTs and their quality become more important when it comes to observing this digital gap particularly as digital inclusion provides the mechanisms for social inclusion in the information societies, and, in short, to acquire a full citizen status (Van de Donk 2000).

The analysis possibilities offered by a comparative perspective to analyse the digital divide and e-Strategies reside, amongst others, in the possibility of outlining certain profiles (analytical types) of said strategies which can be used for guidance to understand other cases. Hence, we have identified the Swedish model with a Universalist model aimed at digital citizenship (in our opinion the most advanced); the British case as exponent of a Liberal model aimed at e-business; the German Corporatist model, concerned about competitiveness, employment and the different social groups affected by the digital divide, and finally, the Spanish case as exponent of the Residual-Mediterranean model of strong investment in infrastructure but with limited development of the use and a strong burden in the cost of using Internet for the families.

If the issue of the digital divide is still important today despite the progress on the issue in Europe, the strategies to overcome it are also equally important. As we have seen in our analysis, the idea of a policy on e-inclusion and e-government is variable, as is the type of welfare regime used in each country object of analysis. The principle result from our comparative analysis is that the digital gap would be inversely related to the level of priorities of those e-strategies focused towards the development of infrastructure which allow the population to have universal access, in terms of availability and affordability, to broadband networks.

Our analysis opens new hypotheses and a line of research related to the comparative analysis between the e-inclusion policies and strategies, the welfare regimes and the new social rights in the knowledge society.

References

- Castaño Collado, Cecilia (2009) La brecha digital de género. Amantes y distantes, Universidad Complutense de Madrid, Madrid.
- Clement, A. and Shade, L. R. (2000) "The access rainbow: conceptualizing universal access to the information/communication infrastructure", in: Gurstein M. (ed.) Community Informatics: Enabling Communities with Information and Communication Technologies, Idea Group Publishing, Hershey, PA, pp. 32-51.
- Crandall, M. and Fisher, K. E. (ed.) (2009) Digital Inclusion. Measuring the Impact of Information and Community Technology, American Society for Information Science and Technology, Medford, New Jersey.
- Criado, J. I. (2009). "Europeanization of eGovernment Policy. Institutional Mechanisms and implications for Public Policy Innovation". Information Polity, Vol 14, No. 4, pp. 315-330.
- Esping-Andersen, G. (1990) The Three Worlds of Welfare Capitalism, Polity Press & Princeton University Press, Cambridge.
- Eurostat (2011) "Almost a quarter of persons aged 16-74 in the EU27 have never used the Internet" Newsrelease, 188/2011- 14 December, [online], epp.eurostat.ec.europa.eu/cache/ITY_PU/BLIC/4-14122011-BP/EN/4-14122011-BP-EN.PDF (accessed on 16/12/11).
- Federal Ministry of Economics and Technology (BMWi) (2006) "iD2010-Information Society Germany 2010. Action Programme by the Federal Government" [online], www.bmwi.de/English/Redaktion/Pdf/id2010,property=pdf,bereich=bmwi,sprache=en,rwb=true.pdf (accessed on 15/09/11).
- Ferguson, Martin (2005) "Local e-government in the United Kingdom", in Drüke, H. (ed): Local Electronic Government. A comparative study, Routledge, London.
- Fernández-Marín, X. (2011) "The impact of e-Government Promotion in Europe: Internet Dependence and Critical Mass" Policy & Internet, Vol 3, No 4, pp. 1-29.
- Government Offices of Sweden (2009) "Broadband strategy for Sweden", [online] www.sweden.gov.se/sb/d/574/a/134980 (accessed on 6/09/11).
- Harris, R. G. (2004) "Information and Communication Technologies for Poverty Alleviation" [online] www.apdip.net/publications/, Malaysia, Kuala Lumpur, UNDP-APDIP (accessed on 8/11/11).
- Marsall, Thomas H. (1998) [1950]: «Ciudadanía y clase social», en Thomas H. Marshall y Tom Bottomore: Ciudadanía y clase social, Madrid, Alianza editorial.
- Martínez Monje, P. M. and Mesa del Olmo, A. (2010) "Digital divide and digital citizenship. Adapting the social policies to promote e-Inclusion", Paper read at 10th European Conference on eGovernment, National Centre for Taxation Studies, University of Limerick, Ireland, June.
- Maxwell, C. (2000) "Global trends that will impact universal access to information resources". Submitted to UNESCO, July, 15.[online], www.isoc.org/isoc/unesco-paper.shtml (accessed on 15/12/11).
- Mossberger, K., Tolbert, C. J. and McNeal, R. S. (2008) Digital Citizenship. The Internet, Society, and participation. The MIT Press. Cambridge, Massachusetts:
- Norris, P. (2001) Digital Divide. Civic Engagement, Information Poverty; and the Internet Worldwide. Cambridge University Press, Cambridge.
- OECD (2001) "Bridging the "Digital Divide": Issues and Policies in OECD Countries". OECD.DSTI/ICCP(2001)9/FINAL [online] www.oecd.org/dataoecd/10/0/27128723.pdf (accessed on 15/06/07).
- OECD "Broadband statistics" [online], oecd.org/sti/ict/broadband, (accessed on 12/10/11).
- Prime Minister's Strategy Unit and Department of Trade and Industry (2005) "Connecting the UK: the Digital Strategy", [online], www.bis.gov.uk/files/file13434.pdf (accessed on 25/07/11).
- Robles Morales et al (2010) "La brecha digital. Un análisis de las desigualdades tecnológicas en España", Revista Sistema, núm. 218, 2010, p. 3-22.
- Secretaría de Estado de Telecomunicaciones y para la Sociedad de la Información. Gobierno de España (2010) "Estrategia 2011-2015, Plan Avanza2", [online], www.planavanza.es/informaciongenera/estrategia2011/Paginas/Estrategia2011_2015.aspx (accessed on 20/10/11).
- United Nations (2010) "E-Government Survey 2010", Economic & Social Affairs [online], unpan1.un.org/intradoc/groups/public/documents/un-dpadm/unpan038853.pdf (accessed on 10/09/11).
- UNDP (2011) "Access to information and e-Governance" [online] www.undp.org/governance/focus_access_information.shtml, (accessed on 10/05/11).
- UNDP (2010) "Access to information and communication technology., Appendix. 2010 Human Development Report". [online], hdr.undp.org/en/media/HDR_2010_EN_Tables_reprint.pdf (accessed on 24/10/11).
- Van de Donk, Wim (2000): "Infocracy or infopolis?", in Hoff, J.; Horrocks, I. and Tops, P. Democratic Governance and New Technology, Routledge, London, pp.138-154.

Transforming Government Through eParticipation: Challenges for eDemocracy

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Abstract: This paper argues that eGovernment holds much potential for transforming government activity, and, in respect to representative government specifically, it focuses upon the development of eParticipation and eDemocracy to enhance the responsiveness of the relationship between government and the governed. Recent upheavals across the Middle East - the 'Arab Spring' - have highlighted the importance of not only the citizens' voice but also their involvement in the democratic process. Declining voter turnout and membership of mainstream political parties over the last 50 years have both been cited as being central to the 'crisis in Western democracies' which is argued to have resulted in disengaged and disenfranchised electorates. Previous work highlights significant disenfranchisement of citizens within the democratic processes. How responsive are citizens to the prospect of expressing their views to their elected representatives via e-Democratic means? The paper examines this question primarily by drawing upon the findings of a survey of citizens' attitudes to actual and potential eDemocracy initiatives. The survey, which collected both quantitative and qualitative data, covered a number of themes including, disenfranchisement, e-Petitions, social media, single issues, influences upon elected representatives and the modernisation of current democratic processes. The results highlight both the extent to which citizens feel disenfranchised and the extent of an appetite for more transparent and empowering political processes via the use of e-Democratic tools. It is concluded that, in the light of scepticism, not only about traditional democratic systems, but also about the democratic credentials of current eParticipation tools such as e-Petitions, governments need to be more innovative in their facilitation of eDemocracy - by actually harnessing the flexibility of the Internet in a more creative manner; for instance by revisiting the design of the e-Petition. The paper concludes by probing the possibility that eDemocracy could facilitate the evolution of democracy into a more responsive system which actually improves on current systems rather than simply reproducing them in electronic form.

Keywords: eParticipation, eDemocracy, e-Petitions, disenfranchisement; democratic processes

1. Introduction

In the early days of the Information Age, the Internet was considered by many to be the start of a new world order, which embraced freedom and opened up the door to direct democracy in a manner that was anarchistic in nature (Barber, 2001/2002, p.2, van Dijk, 2006, p. 95). However, writers such as Poster (1995, p. 81) have suggested that the Internet has been constructed in the image of the world as it was known. In doing so, limitations have been placed on the potential to capitalise on the possibilities the Internet offers. Rather than referring to the processes of the pre-Internet paradigm and seeking simply to digitise them - even where there is an attempt to improve efficiency and quality of the experience - more emphasis should be given to creating new processes that explore an innovative approach to improving political engagement and parliamentary representation, thus seeking to address the issue of the disenfranchisement of citizens. Indeed, van Dijk (2006) concludes that the relatively modest achievement of eDemocracy to date is improved access and exchange of information between the state and citizen, which has the result of making the citizen more independent, in information terms, both from government and the mass media.

eGovernment allows the governments of countries around the world to provide their services more efficiently, for example, by reducing costs and providing existing services more quickly and comprehensively, but it also provides opportunity to re-conceptualize the very nature of government. This includes transforming relations with citizens, the private sector and other government agencies to promote citizens' empowerment, improve quality of service delivery, strengthen accountability and increase transparency. According to Silcock (2001), "For the first time since the creation of the modern welfare state, there is now a real opportunity to 'reinvent' government" (p. 88). The move towards eGovernment presents opportunities to rethink and redesign government processes and the interface between government and citizens, particularly as regards the actual political processes of

disseminating government information to citizens and of opening up *two-way* channels of communication between citizens and politicians. Governments are becoming increasingly adept at using a range of electronic media to disseminate information to citizens and many individual politicians also have their own blogs or Twitter sites. However, it is tools such as e-Petitions, e-Polling and e-Voting which offer the potential for *citizens* themselves to become more *actively* involved in an interactive manner which can inform the political agenda.

Previous research based on a survey undertaken in 2010 found that while 80% of respondents considered themselves politically aware, only 31% indicated they were politically active, which suggests that a real interest in politics exists but only a minority are actually engaging, thus calling into question the assertion that apathy per se is the key barrier to political engagement. This theory is further reinforced by the result that only 27% of participants indicated that they did *not* feel disenfranchised. Thus our conclusion was drawn: *disenfranchisement* is a far *greater* problem than political *apathy* (Murton et al, 2010).

2. Overview of current eDemocracy and eParticipation initiatives

There are a considerable number of initiatives and provisions to further eDemocracy in many countries. Indeed, in this research the survey sample went viral and was thus international. However, given the primary delivery channels, respondents of three nationalities predominated (UK, Australia and Slovakia). As such, given space limitations, this paper must necessarily limit its coverage to some very brief background regarding developments in two of these three countries (UK and Australia) regarding which there are already many informative studies (egs. Lindner & Riehm, 2009, and, Palmieri, 2007).

The UK: e-Petitions websites are the closest the UK has come to implementing any form of e-Democratic facility at the national level. These were first made available on the Downing Street website by Tony Blair's Labour government. In February 2007 an online petition against road pricing on this website attracted over 1.8 million e-signatures. This e-Petitions system was suspended in April 2010 and was replaced with a new HM Government-run facility in August 2011. It was pledged that any petition attracting at least 100,000 signatures would be considered for debate in Parliament.

Since this new website has been launched, the petition gathering the highest number of signatures reads: "Convicted London rioters should loose [sic] all benefits" with circa 250,000 signatures. Despite the apparent popularity of this petition, it has not been tabled for a debate in Parliament. It is reasonable to suppose that the brevity of the petition and the failure to set out a reasoned argument for the action, as well as the spelling mistake, belies the reactionary, ill-considered nature of this petition, which makes it easy for Parliament to dismiss its validity. A debate *has* been successfully triggered by an e-Petition requesting the full disclosure of documents relating to the Hillsborough Disaster, which resulted in full compliance with the motion of the petition. However, the most supported e-Petition (with 170,000 signatures) is currently that which urges the dropping of the contentious Health Bill; however, at the time of writing (early March, 2012), the government is still refusing to schedule a debate on the issue despite the Prime Minister pledging that such support would ensure one "whether we like it or not" (Chand, 2012). Incidentally, two of the authors of this paper submitted their own e-Petition to the site in May 2011 requesting that the site be redesigned in order to allow people to indicate whether they were 'for' or 'against' each petition. This was summarily rejected by the site's administrators who claimed that a similar petition existed, although they did not point towards it and it could not be found.

Australia: The Australian Bureau of Statistics' most recent report into Household Use of Information Technology (2011), found that nearly three-quarters of Australian households have broadband, and the apparent impediment to greater Australian eParticipation in eDemocracy was low income. The proportion of households in the highest income quintile with Internet access was 95 per cent, whereas in the lowest income quintile it is only 55 per cent. Furthermore, the proportion of people who access the Internet increased as educational attainment level increased; 95 per cent of those with a Bachelor degree or above accessed the Internet.

With this apparently privileged access to e-Connectivity it would be reasonable to assume Australian eDemocracy uptake would be considerably higher than most. Some successful examples of Australian not-for-profit eDemocracy uptake sites include, the National Forum, launched in 2005, a dedicated site for petitions to be presented to any Australian parliament; and Open Forum, which is

an independent collaborative think-tank built around an interactive discussion website, hosted and moderated by Global Access Partners (GAP). It provides a platform for focused dialogue on social, political, economic, ecological and cultural issues and challenges.

3. Methodology

A survey was designed to capture people's attitudes to, and, experiences and expectations of, e-Democratic tools. The survey consisted of 20 questions capturing both quantitative and qualitative data. The main themes covered include respondents' experiences and expectations of using e-Petitions, whether respondents had contacted their elected representatives, their views as to how politicians should take note of the results of e-Petitions, views on democracy and eDemocracy and the role and expected roles of technologies in democratic processes. Likert scale questions were widely used to capture greater granularity of views and an open question was used to enable respondents to put forward any other views on the topics covered in their own words.

Following a pilot exercise, the survey was primarily distributed via channels in three countries: the UK, Australia and Slovakia. Given our aim to ascertain the views across multiple political systems, it was deemed appropriate not to put any geographical boundaries on the sample. Consequently, the responses are not likely to be truly representative of any specific nationality, but they do provide a window into the views of a diverse set of citizens. However, although significant differences between the 3 primary national groups are not at this stage immediately apparent, the survey is still open and we plan to include a comparative analysis in a future paper.

4. Presentation and analysis of results

Out of 330 responses 263 fully completed the survey (81%) with the remaining missing some questions out (as indicated in the results figures below). There was a gender bias in the responses with 73% of the respondents being male. Background information included the occupations of respondents: these were mainly professional or students.

Overall, many of the results show the majority of respondents to feel disengaged, bypassed or disenfranchised, by current democratic processes. However, just over 50% of respondents had signed an e-Petition (Figure1)

Answer Options	Response Percent	Response Count
Yes	50.9%	168
No	45.5%	150
Don't Know	3.6%	12
<i>answered question</i>		330

Figure 1: Qu. 5: Have you ever signed an e-Petition (i.e. an online petition)

Qu.6: Answer Options	Response Percent	Response Count
I don't have ready access to the Internet	1.0%	1
I dislike giving out personal details to e-Petition websites	6.2%	6
I haven't come across one	56.7%	55
I haven't come across one that I felt strongly enough about to sign	36.1%	35
Other (please specify)		9
<i>answered question</i>		97

Figure 2: Qu. 6: If you answered 'No' to the previous question, please state the main reason why you have never signed an e-Petition

Of those who answered the follow-up question, 57% reported that they have simply not come across an e-Petition. However, this still means that only 17% of the entire sample (55/330) *had not* come across one which could indicate that e-Petitions already have a *substantive* profile on the Internet. Indeed, it is apparent that considerably more respondents had actually already signed an e-Petition (168) than have ever contacted their elected representative or MP (111): see Fig.5.

Answer Options	Response Percent	Response Count
Definitely agree	11.7%	31
Mostly agree	34.7%	92
Neutral	32.1%	85
Mostly disagree	13.2%	35
Definitely disagree	8.3%	22
<i>answered question</i>		265
<i>skipped question</i>		65

Figure 3: Qu.7: Petitions (including e-Petitions) are anti-democratic because they only ascertain the numbers FOR the motion of the petition, not those against. e-Voting, is therefore preferable

With 46.4% agreeing that current e-Petitions are 'anti-democratic' makes some case for e-Polls as a better alternative whilst only just over 20% (21.7%) actually disagreed, the results show a range of responses. This is some indication though that e-Petitions, particularly their current design (which simply reproduces the traditional version), are not seen by the electorate as being a particularly progressive vehicle with which to engage citizens in eDemocracy.

The results in Fig. 4 indicate that a fear of surveillance could be a limiting factor for eDemocracy, prompting questions of how the values of the secret ballot might be replicated in the digital world. Indeed, fears over the anonymity of online voting were expressed by a number of respondents, for instance: *"None [sic] can be sure that online data can be deleted or even transformed. Therefore, it is possible [for] an electronic vote to be corrupted or used against the voter. Moreover, there probably is not enough security online for such actions to occur. Lastly, it may harm your online profile long-term, if you comment or post something online."* However, there are encouraging indications that developments in software encryption techniques could address such concerns by simultaneously providing identity verification and privacy protection (see for example Diaz et al, 2008).

Answer Options	Response Percent	Response Count
Very likely	10.6%	28
Somewhat likely	24.2%	64
Don't know	5.3%	14
Somewhat unlikely	26.8%	71
Very unlikely	33.2%	88
<i>answered question</i>		265
<i>skipped question</i>		65

Figure 4: Qu.8: How likely are you be to express political views on social media such as Twitter and Facebook?

In contrast to Figure 5, it is interesting to note that more people have signed an e-Petition (Qu.5) in the relatively short time they have been available, than have ever contacted their political representative by whatever means.

Answer Options	Response Percent	Response Count
Yes, by letter or telephone	14.7%	39
Yes, by the Internet only	12.1%	32
Yes, by the Internet AND by letter or telephone or in person	15.1%	40
No	55.5%	147
Don't know	0.8%	2
Other (please specify - eg. in person/face-to-face only)	1.9%	5
<i>answered question</i>		265
<i>skipped question</i>		65

Figure 5: Qu.9: Have you ever contacted your national elected representative (e.g. your MP)

The Question (10) as to which of 10 different influences elected representatives take into account most when deciding how to vote in Parliament produced some very interesting results, especially when average rating is analysed. The strongest influence by a distinct margin was their party political leadership, with an average rating of 1.66). 'Their own views and beliefs' (2.47) and 'Business and corporate lobbyists' (2.52) were second and third. However, 'Single issue and campaign group lobbyists' came a close fourth (2.54).

Answer Options	1	2	3	4	Rating Average	Response Count
Their constituents	28	26	42	48	2.76	144
Their party political leadership	126	46	24	15	1.66	211
Their party's election manifesto	19	50	33	30	2.56	132
The mass media (principally the press and television)	10	55	45	32	2.70	142
Their own views and beliefs	42	35	48	34	2.47	159
The views of the public as expressed via Internet channels e.g. e-Petitions and social networks	7	13	19	24	2.95	63
Labour unions	3	14	19	16	2.92	52
Business and corporate lobbyists	25	41	36	28	2.52	130
Single issue and campaign group lobbyists	9	21	14	13	2.54	57
Mass street demonstrations	7	13	16	19	2.85	55
Other (please specify)						12
answered question						265
skipped question						65

Figure 6: Qu.10: Once they are elected, which of the following do you think elected representatives take into account most when deciding how to vote in parliament? Please rank your top four answers in order (1 being the most important to them)

Near to the bottom of the influences (in 7th position out of 10), with a rating just 2.76, came 'Their constituents' which again is an indication of disenfranchisement amongst the electorate in that, once elected, the very large majority of respondents clearly felt that their views had little import on their representative. Indeed, 80% of respondents did not think that constituents were the most important influence on elected representatives. Moreover, with views expressed on 'Internet channels' such as e-Petitions and social networks being rock bottom in last place in terms of influences, it may be concluded that eDemocracy has a long way to go in terms of being an important influence on elected representatives. However, as the next result (Fig. 8) demonstrates, there is a clear desire amongst respondents that their views as expressed via e-Democratic means should be taken a lot more seriously by those they elected to represent them. A number of the qualitative responses (Qu.20) voice this interpretation, with the following being not untypical:

"Government by representatives has grown too far from the 'will of the people', and the representatives have become responsive to money, power and to actions which will perpetuate the power. The people need more control. We need to re-think government completely to get closer to democratic ideals." and, "Governments only pay lip service to public participation using the internet. They like to be seen doing something but at the end of the day basically ignore what their constituents really want."

Question 11 asked whether, " If it could be established through e-Democratic means that more than 50% of the voters in a constituency wish their MP to vote in a certain way, MPs should be forced to do so, even if it means going against their party's leadership." Almost 64% agreed that MPs should be *forced* to vote as instructed by their constituents (even if this meant going against their Party leadership). This can be understood as a powerfully expressed message in support of a move towards a more direct democratic system, with only a little over 14% actually disagreeing with such compulsion.

In Oct 2007, David Cameron (now UK Prime Minister) stated that: "When we look at our democracy, we are still stuck in the dark ages." Only 16% disagreed with this statement (Qu.12) again underlining the appetite for change in our political system.

Figure 7 is also interesting in that it apparently indicates how attitudes to politics are changing with 63% of respondents stating that they were more interested in single issues than in being a member of a political party. Only 14% actually disagreed that single issues were not of greater interest to them.

Answer Options	Response Percent	Response Count
Definitely agree	25.9%	68
Mostly agree	37.3%	98
Neutral	22.4%	59
Mostly disagree	11.4%	30
Definitely disagree	3.0%	8
<i>answered question</i>		263
<i>skipped question</i>		67

Figure 7 Qu.13: I am more interested in supporting campaigns on 'single issues' (e.g. environmental issues, EU membership) than I am in being a member of a political party

A large majority (77%) agreed that the Internet has a central role to play in the modernisation of our democratic system, only less than 7% did not, thus indicating the huge latent potential of eDemocracy for increasing the engagement of the electorate in the political process? Indeed, 80% believed that the Internet had already given more people a political voice (Qu. 17.)

Answer Options	Response Percent	Response Count
Definitely agree	29.2%	77
Mostly agree	23.5%	62
Neutral	20.5%	54
Mostly disagree	9.8%	26
Definitely disagree	17.0%	45
<i>answered question</i>		264
<i>skipped question</i>		66

Figure 8: Qu.18: I would be more likely to vote if I could do it online (including via mobile phone)

As to the increased likelihood of voting if it could be done online including via mobile (Fig.8), although 53% agreed, 21% were neutral, 27% disagreed and thus the result represents a diverse range of opinions.

5. Discussion

The results clearly indicate an appetite for some substantive form of eDemocracy and it is clear that current initiatives are not delivering their full potential. For instance, the findings indicate that the respondents are unequivocal in believing that, once elected, the biggest influences on MP's voting behaviour are those of their party political leaders, business and corporate lobbyists and their own personal beliefs as opposed to the views of their own constituents including those expressed via Internet channels.

The findings also indicate that citizens are substantially more interested in being heard on 'single issues' than they are in being members of mainstream political parties (and thereby of accepting the 'all-in-one package' policies of traditional party politics).

Within the wider debate from the literature some of the issues identified in the survey responses also emerge. At a global and international level, Guibernau (2001) identifies the dilemma between global and political integration and the range of challenges of governance. Key to Guibernau's perspective is the need to manage the diversity of needs and for democratic participation from citizens. In similar vein, Dahl (2000) asserts that concepts of democracy are complex and that identifying what an 'ideal democracy is' is not an easy task.

Bellamy and Taylor (1998) explore issues of re-engineering the government machine and how new technologies stimulate organisational change. They also explore the changing relationship between governments and citizens, and the natural extension towards consumerism of political events and issues. 'Citizen consumers' want a voice and this is set to change the concept of citizenship and democracy in the information age. Citizens have more means than before to hold governments to account (1998, p91). Previously, holding governments to account was the domain of the press: "since few ordinary citizens have the knowledge, ability or time – or even the inclination – to go in pursuit of official information, whereas it is an important function of the press to do so on their behalf" (Wraith 1977, p49). Times have changed, and the ability of citizens to explore and scrutinise much government data online enables citizens to take on board the roles previously associated with the press in holding governments to account. There are vastly more citizens than members of the press. Indeed, we seem to be at a significant time in history for open systems of government (Lathrop and Ruma, 2010). Indeed, as one respondent asserted: *"The internet, facebook, twitter and other media have created a greater transparency of government as many events and situations cannot be "covered up" or ignored as these media have empowered the people/constituents."*

Peters (1986) identifies the key point of political agenda setting and who has the power to set the agenda: "Establishing an agenda for society...is a manifestly political activity, and control of the agenda gives substantial control over ultimate policy choices". Although agenda setting is complex where different arenas have different power groups, this paper argues that, even if the individual citizen is largely left out of the agenda setting loop, they could still have the ability via for instance *constituency e-Polls*, to indicate their preferences to their elected representative in an auditable and quasi-formal system.

In the light of scepticism, not only about the party political system, but also about the democratic credentials of current eParticipation tools such e-Petitions, governments need to be more *innovative* in their facilitation of eDemocracy - by actually *harnessing* the flexibility of the Internet in a more creative manner; for instance by revisiting the design of the e-Petition. Primarily, this could involve replacing them with e-Polls so that participants could indicate whether they are 'for' or 'against'. This change would thus serve the interests of both voters and politicians by utilising the flexibility of the Internet in order to *enhance* the democratic process (rather than merely gauging support for only one side of public opinion. In practice it is surely the quantitative gap *between* those 'for' and 'against' which should be of greater interest to government). Furthermore, the participative nature of e-Polls, could help to address the disengagement from the democratic process which has often been cited as a contributory cause of anti-social and criminal behaviour; for instance research into the English riots of 2011 found perceptions social and economic injustices, discrimination and lack of respect. (Reading the Riots, 2011). Finally, if the summary arguments for and against each e-Petition were to be found in one place then it is more likely that people will consider *both* sides of the argument before signing: thus e-Polls would be a far more democratic mechanism than mere e-Petitions (which inherently encourage people to only think about one side of the argument). Further, a link could then be added to a social networking site so that people can debate the issue and be exposed to those with differing opinions.

Ultimately the theme emerging repeatedly from the research is that it is the very *informality* of eDemocracy to date which is the key limiting factor. If it is to take its place in the modernisation of our democratic systems, it needs to become more formalised in the form of legally underpinned structures which cannot be ignored by elected representatives.

The qualitative responses from the survey clearly indicated scepticism about the current systems and thus arguably underline the need for e-Democratic processes to be given more formal influence. The following responses (Qu.20) are broadly representative:

"Unless and until the power processes that determine who stands for election and decides the party platforms are democratised then the internet will remain outside the process."

"E-petitions can be quite problematic, as they are quite passive and I think aren't taken very seriously by legislators or executive."

6. Conclusions

This paper concludes by making four main points:

Firstly, the main findings of this research indicate that there is a real appetite for change in our democratic processes. The respondents seem to welcome the prospect of informing political debate through eDemocracy. There is also expectation that the results of such participation should influence politicians in their decision making. However, it is clear that a sense of disenfranchisement from, and disengagement with, the current democratic system, is prevalent within the large majority of respondents.

Secondly, in the wider context of a year that has seen widespread civil unrest in both democratic and undemocratic countries, it is concluded that a more innovative focus upon the potential of eParticipation and eDemocracy to transform representative government must be pursued. Given that the electorate *does* have the motivation to participate more actively in the political process, the Internet should be seen not as a “technical fix”, but rather as a pivotal facilitator: As one respondent asserted: “*I see the use of Internet and technology as a tool not as an ultimate solution. More important is to change system: 1) we need to motivate people so they are more interested in politics 2) better feedback - if politicians broke the promises, lie, next time they don't get to parliament*”

Thirdly, there is plenty of scope to improve both the publics' and the politicians' confidence in the veracity of e-Petitions by developing more robust software to facilitate both identity verification and privacy protection (eg. Diaz et al, 2008). In short, eDemocracy is a profoundly *interdisciplinary socio-technical* endeavour upon which different disciplines (eg. social scientists and software engineers) could (and should?), collaborate much more closely than they have done to date.

Finally, the possibility that eDemocracy could facilitate the evolution of democracy into a more responsive system which actually *improves* on our current system rather than just reproducing it in electronic form, needs to be further explored. Ultimately, this would entail the design of a system which goes beyond current democratic practices and which attempts to build what might be termed ‘democracy-plus’. Central here, is the formalisation of the status of e-democratic tools such as e-Polls and e-Petitions. This is certainly not to suggest a crude direct democracy in which the results of these would be legally binding on politicians, but rather a formal expectation that they must be addressed by them in a coherent and transparent manner. Indeed, apart from a relatively small role for e-Petitions, it can be argued that it is the function of elected politicians to actually set the agenda per se, but critically only in a context in which they are demonstrably (and actively) listening to their constituents' views. For instance, a system could be put in place for each constituency as follows: each motion in parliament on which an MP votes is posted verbatim on their website (perhaps with explanatory/factual notes and resources as necessary); each constituent has verified access to the site and may express their view as to how their MP should vote on the motion. A threshold of say 20% of the constituents might be required? Critically, we are not suggesting that the MP need vote in the way indicated by the verified e-poll of their constituents, but that they should be required by law to provide a written statement on the site as to why they are not doing so. If an elected representative *repeatedly* ignores the views of their constituents over time, say 2 or 3 times over 2 years, then there may be a process assessing the democratic legitimacy of that MP which might ultimately result in their de-selection. It is by the *formalisation* of processes such as this, that the challenge of reducing the disenfranchisement of citizens might be met via the empowering transparency of the e-Democratic resources now increasingly available to *both* governments and citizens.

References

- Australian Bureau of Statistics. (2011). *Australian Bureau of Statistics Multipurpose Household Survey*, (Australian Bureau of Statistics Publishing). Retrieved January 12, 2012, from: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/8146.0>
- Barber, B. (2001/2002). *Which Technology for Which Democracy? Which Democracy for Which Technology?* *International Journal of Communications Law and Policy* (6).
- Bellamy, C. and Taylor, J.A. (1998). *Governing in the information age*. Open University Press: Buckingham.
- Cameron, D. (2007). *Cameron Speech in Full*. Retrieved 9/10/2011, 2011, from <http://news.bbc.co.uk/1/hi/7026435.stm>
- Dahl, R.A. (2000). *On Democracy*. New Haven: Yale University Press.
- Diaz, C., Kosta, E., Dekeyser, H., Kohlweiss, M. and G. Nigusse (2008), *Privacy preserving electronic petitions*, *Identity in the Information Society*, 1(1).
- Guibernau, M. (2001). *Governing European Diversity*. London: Sage Publications.
- Hutton, W. (2011, Nov 6th). *Is capitalism broken... and what is the world going to do to fix it?* Retrieved January 14, 2012, from: <http://www.guardian.co.uk/theobserver/2011/nov/06/is-capitalism-broken-occupy>
- Lathrop, D. and Ruma, L. (eds) (2010) *Open Government: Collaboration, Transparency, and Participation in Practice*. Cambridge: O'Reilly.

- Lindner, R. and U. Riehm (2009), *Electronic Petitions and Institutional Modernization: International Parliamentary E-Petition Systems in Comparative Perspective*, Journal of eDemocracy and Open Government.
- Murton, K. Adams, C. and Millard, P. (2010). *Is eDemocracy the democracy or an illusion of participation?* Paper presented at the mLife Conference on mGovernment
- OECD. (2011). *OECD Communications Outlook 2011*. (OECD Publishing). Retrieved January 12, 2012, from: http://dx.doi.org/10.1787/comms_outlook-2011-en
- Palmieri, S. (2007), *Petitions effectiveness: improving citizens' direct access to parliament*, presented at the ASPG Conference – Parliament's Accountability to the People, 23-25 August, Adelaide.
- Peters, B.G. (1986). *American public policy: Promise and performance*. London: Macmillan.
- Poster, M. (1995). *Postmodern Virtualities*. In Featherstone, M. & Burrows, R. *Cyberspace/Cyberbodies/Cyberpunk: cultures of technological embodiment* (pp. 79-96). London: Sage Publications Ltd.
- Reading the Riots: Investigating England's summer of disorder – full report*, (2011, Dec 14th) The Guardian and London School of Economics & Political Science. Retrieved March 3rd, 2012, from: <http://www.guardian.co.uk/uk/interactive/2011/dec/14/reading-the-riots-investigating-england-s-summer-of-disorder-full-report>
- Silcock, R. (2001). *What is EGovernment*. *Parliamentary Affairs*, 54 (1), 88-101.
- van Dijk, J. (2006). *The Network Society (Second Edition)*. London: Sage Publications Ltd.
- Chand, K. (2012, March 2nd) *Why won't the government debate the 'Drop the health bill' e-petition?*, The Guardian. Retrieved March 7th, 2012, from: <http://www.guardian.co.uk/commentisfree/2012/mar/02/government-debate-health-bill-e-petition>
- Wraith, R. (1977). *Open Government, The British Interpretation*. London: Royal Institute of Public Administration.

Identifying Citizen-Demanded eGovernment Services in Tanzania

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Abstract: Adoption is one of the key factors for the success of eGovernment initiatives. High adoption requires that adoptable eGovernment services are deployed to citizens. Accordingly, Governments need to be informed on eGovernment service requirements that their citizens want and expect. This is particularly important in developing countries context where eGovernment is still new to governments as well as to citizens. Understanding citizens' eGovernment services requirement will facilitate the processes of designing and deploying eGovernment initiatives that meet citizens' needs and expectations. This will enhance the possibility of the adoption of eGovernment initiatives. We present the results of an exploratory study concerning service requirements by citizens in Tanzania, a typical developing country. The study focused on identifying priority services that citizens wish to receive electronically from the Government of Tanzania. Results show that government services that citizens are prepared to receive electronically are 1) Education Services, 2) Government Certificates, 3) Government Information, 4) Healthcare services, 5) Passport Application, and 6) Tax Payment. The study also reveals that citizens are prepared to interact and transact with the Government electronically. These results provide useful insights to the Government of Tanzania and other similar developing countries. They also extend the debate concerning designing of eGovernment services elsewhere.

Keywords: eGovernment, eServices, ICT4D, Tanzania, developing countries

1. Introduction

Adoption is one of the key factors for the success of eGovernment initiatives (Yonazi, Sol & Boonstra, 2010). According to Margett (2006), high adoption increases the chance that eGovernment initiatives will facilitate social and economic benefits to citizens. In turn, this will contribute on gaining the return of investments committed on implementing the initiatives. Accordingly, government and developers need to be equipped with information on how to design and deploy eGovernment initiatives with high adoption potential by the citizens.

Various theories are available potential to inform the process of designing citizen adoptable eGovernment initiatives. Typical examples include Technology Acceptance Model (TAM) by Davis (1989), Diffusion of innovations (DOI) by Rogers (2003), and Theory of Planned Behaviour (TPB) by Ajzen (1991). The theories suggest a range of issues possible to explain the adoption of eGovernment at initiatives for citizens. Examples of such issues are user characteristics (e.g. relative familiarity with ICT); system properties (e.g. easy of use); social-cultural (e.g. preference for face-to-face contact); and organisational issues (e.g. lack of legal framework) (Carter & Belanger, 2005; Dimitrova & Chen, 2006; Ndou, 2004). Other studies have explored possible eGovernment services for citizens (e.g. Cap Gemini Ernst & Young, 2004; Kamal, 2006; Sabherwal, Jeyaraj, & Chowa, 2006; Shahzad & Sandhu, 2007). Examples of the services include application for visa, tax returns, renewals of driving licences, job and work permit applications.

The theories highlighted above provide useful insights potential to inform processes for designing adoptable eGovernment initiatives. However, the process of designing eGovernment services is not automatic. It requires a good understanding of contextual issues that may attract citizens' high adoption of the initiatives (Yonazi, 2010). Such issues are many, complex, and contextual. This is particularly so when the intended users are citizens and have freedom to accept or reject the initiatives. It also gets more complicated when designing eGovernment initiatives at different stages of evolution; i.e. publish, interact or transact (InfoDev, 2002). It is therefore imperative that designers of eGovernment initiatives gain an adequate understanding regarding adoption issues including types of services needed and expected by the citizens from their government.

Existing theories only provide information regarding antecedents of adoption; few identify specific citizen adoptable eGovernment services. They may therefore be deficient to adequately inform the process of designing citizen adoptable eGovernment initiatives. This is particularly so in the developing countries context. Limited knowledge is available on the types of eGovernment services and their stages of evolution that citizens are likely to adopt in that context. This situation is similar in Tanzania, a typical developing country. Currently, limited information is available regarding the type of adoptable eGovernment services for citizens in the country.

The situation we highlight above needs to be addressed. Otherwise, there is a high chance of developing initiatives with low adoption potential, thus high risk of failure of the eGovernment initiatives (Heeks, 2006). This is because governments in developing countries may continue implementing eGovernment initiatives with low adoption potential. This may have severe consequences such as loss of resources and trust to government electronic initiatives by citizens. Accordingly, in this study we seek to contribute in addressing this situation. Specifically, we aim at establishing types and evolution stage of eGovernment services that citizens in Tanzania wish to receive and adopt from the Government of Tanzania. Further we aim at mapping the identified services to the eGovernment evolution framework suggested by World Bank; publish, interact and transact (InfoDev, 2002). The resulting knowledge is useful to the Government of Tanzania, and other similar developing countries, practitioners and researchers globally. Further, the results contribute to the general debate concerning designing adoptable of eGovernment services initiatives in developing countries.

2. eGovernment in Tanzania

Tanzania is making some progress in the implementation of eGovernment (Table 1). According to the UN (2010) the country's eGovernment development index (0.2926) value remains below world average (0.4406) and slightly higher than the East African regional (0.2782) average. It is also below its neighbour Kenya (0.3338) and slightly above Uganda (0.2812). Regardless of the above, various eGovernment initiatives have been implemented and more are underway in the country. Examples of typical eGovernment initiatives include development of service portals, payment of utility bills using mobile phones, and establishment of back office systems in the government (Kiwango, 2009, Sawe, 2007, Yonazi, Sol & Boonstra, 2008).

Table 1: Tanzania's position in sub region and world ranking

Country	EGovernment development index value		World eGovernment development ranking	
	2010	2008	2010	2008
Mauritius	0.4645	0.5086	77	63
Kenya	0.3338	0.3474	124	122
United Republic of Tanzania	0.2926	0.2929	137	143
Uganda	0.2812	0.3133	142	133
Rwanda	0.2749	0.2941	148	141
Burundi	0.2014	0.1788	174	174
Sub-regional average	0.2782	0.2879		
World average	0.4406	0.4514		

Source: UN, 2010

Investments and efforts made by the Government of Tanzania on eGovernment need to be guided. The guidance should be in the types of eGovernment services that are likely to attract high adoption by citizens in the country. Otherwise, little benefits will be gained out of the investments committed. This study contributes into addressing this issue.

3. Approach

The nature of this study influenced our decision regarding the appropriate approach to apply. We considered that eGovernment is still new in Tanzania. Accordingly, most of our respondents may have little experience and knowledge on interacting with the Government through electronic means. Yet, our study aimed at establishing their wishes on obtaining Government services electronically. This situation may lead us into recording only some guess work. Accordingly, we decided to approach our

study more inductively. This approach allowed us interact with citizens interpret their inferred meanings until we reached data saturation.

We observed that data relevant to our enquiry could be obtained mainly from ordinary citizens (non ICT practitioners). However, we complemented the collected information with insights from government reports, plans and experiences of ICT experts (practitioners) in the country. While ordinary citizens provided their opinions and wishes on eServices they would prefer from the government, ICT experts contributed their observations and experiences gained from managing and developing government digital services. Table 2 below summarises the key data sources and respondents or our study.

Table 2: Profiles of respondents

Category	Number	Instrument	Respondents
Ordinary citizens	49	Questionnaire	Government employees, Students (university and secondary school), parents
	24	FGD	Randomly selected participants
ICT Experts	12	Interview	ICT Managers, Developers, Webmasters, Systems administrators, Cybercafés operators
	24	FDG	
Total	109		

An open-ended questionnaire was used to collect information from the citizens while an interview guide was used for the experts. 49 Citizens responded to our questionnaire while 24 participated in Focus Group Discussions (FGD). We further interviewed 12 experts and invited 24 for FGD. For each FGD, participants were first introduced to the topic and objective of the study. They were then divided into groups and given about 30 minutes for discussion. Each group was then requested to present a summary of their findings in a plenary session. The average time for each focus FGD was 2:15 hours. At the end of each session, a report was prepared and used for analysis.

A qualitative data analysis approach was used to guide data analysis (Straus and Corbin, 1998). Data from the interviews, questionnaires, and FGDs were fully transcribed. A qualitative analysis software (Atlas.ti) was used for data management and analysis. Open coding, followed by focused coding was conducted. Further interpretation of each emerging category was done. We provide the summarised list of selected codes in Appendix 1.

4. Results

Six main categories of eGovernment services emerged from our analysis (Figure 1). They are 1) Education Services, 2) Government Certificates, 3) Government Information, 4) Healthcare services, 5) Passport Application, and 6) Tax Payment.

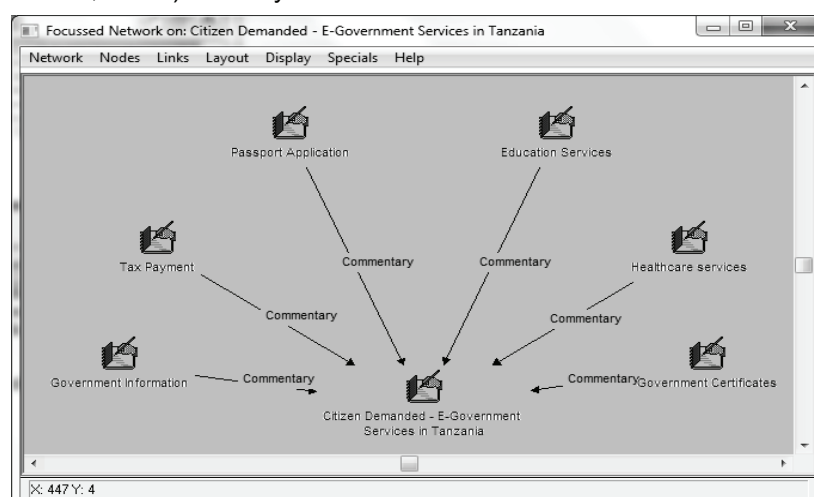


Figure 1: Emerged eGovernment services (Atlas.ti)

4.1 Education services

This category indicates the need for citizens to receive education related services from the government. Specific services identified include application for admission into education institutions

(e.g. universities and colleges), education loans, and receiving of examination results particularly from the National Examination Council of Tanzania (Table 3).

Table 3: Education services category

Specific services	Code	Evolution Stage
Application to Education Institutions	EAP	Interact
Education Loan Application	EL	
Receiving National Examination Results	ER	

In Tanzania, the completion of these services is not instant. Respondent understand that one have to lodge an application and wait for a respective institution to respond. Accordingly, these kinds of services can be positioned in the *interact stage* of eGovernment evolution.

4.2 Government certificates

This category relates to need by the citizens to obtain some general certifications from the government; examples of such certifications include certificates related to birth, marriage and death (Table 4). Currently, these certificates are provided by the Registration Insolvency and Trusteeship Agency (RITA). Although such certificates have to be collected physically from the organizations, respondents observed that there is a need of automating the process. A particular call was made on the need for electronic application and notification of birth and death certificates.

Table 4: Government certificates

Specific Service	Code	Evolution Stage
Birth Certificates	CB	Interact
Death Certificates	CD	
Marriage Certificates - Certified	CM	

Services indicated in this category are also not instant. With current laws and regulations in Tanzania it may be possible to apply for these services electronically. However, the applicant will still need to collect the certificate physically from RITA offices. It is therefore relevant to position this category of services at the *interaction* stage of eGovernment evolution.

4.3 Government Information

This category reveals citizens' willingness to obtain government information electronically. Typical services that fall under this category include reports and information regarding procurement and job vacancies (Table 5). Traditionally, in Tanzania, information from the government has been through newspapers. However, in recent years, the government started to use websites to provide information regarding vacancies. Examples of such websites are www.utumishi.go.tz and www.ppra.go.tz.

Table 5: Government information services

Specific Service	Code	Evolution Stage
Government information - Procurement	PRC	Publish
Job Information	JOB	
Reports	REP	

Provision of government information such as job vacancies, procurement notices, and reports is mainly unidirectional. Limited level of interaction is expected in such kind of services. Accordingly, such services can be categorizes in the *publish stage* of eGovernment evolution.

4.4 Healthcare services

Key issues identified to relate to this category were medical appointments and advises (Table 6). Respondents observed that it would be appropriate to be able to make appointments with medical personnel electronically. They also wished to receive healthcare advises regarding the use of medicines, side effects, and protection against infectious diseases.

Table 6: Healthcare services

Specific Service	Code	Evolution Stage
Medical Appointments	HAPP	Transact
Medical Advise	HADV	

Requests regarding healthcare were observed to be sensitive. Patients wish to be responded to instantly. This is particularly so when one is requesting for advice regarding side effects resulting from the use of new drugs. Accordingly, we perceive that the nature of such services point to the need for *transact stage* eGovernment services.

4.5 Passport application

Requirement for electronic passport application was expected in this study (Table 7). This is because, although the government have simplified the application procedures, the process is still time consuming and cumbersome. It was established therefore that, citizens would wish to have the possibility to electronically lodge their passport applications and receive notification on the progress of their requests.

Table 7: Passport application

Specific Service	Code	Evolution Stage
Passport Application	PRC	Interact

Because of the requirement and processes involved in the process of issuing a passport, this service can not be completed without the visit to the Immigration Department Offices. This is because processes such as recording of finger prints require one's physical presence. However, electronic notifications on the receipt and status of the application can be provided. Therefore this service fits in the *interact stage* of eGovernment evolution.

4.6 Tax payments

This category refers to services related to financial payments to the government (Table 8). These services are handled by different government ministries, departments and agencies. However, citizens perceive them as *sources of revenue* of the government. We therefore decided to group them together. They include payments for company registration, business licences, residence permit,

Table 8: Tax payment services

Specific Service	Code	Evolution Stage
Company Registration	COMR	Transact
Business Licenses	BUSL	
Residence permit	RESP	
Vehicle Registration	VHCR	
Work Permits	WRKP	
Driving license	DRVL	

Services under this category require that citizens make payments, the government receives the payment and issues a legal receipt, and the citizen receives the receipt. The nature of this activity points to the citizens' demand for fully *transactional stage* eGovernment services.

5. Discussion

The results of this study are supported by the literature (e.g. Kamal, 2006; Sabherwal, Jeyaraj, & Chowa, 2006; Shahzad & Sandhu, 2007). They present an interesting new revelation from eGovernment adoption in Tanzania. That is, the difference between the levels of eGovernment progress of the country, and citizens willingness to engage and transact with the government electronically. It indicates that, regardless of the stage of eGovernment progress, citizens may demand more sophisticated services. In this case, although Tanzania is still in its nascent stages of implementing eGovernment initiatives (Yonazi, 2010), the preparedness of the citizens have significantly advanced towards transact stage of eGovernment evolution. This may have been influenced by the increasing penetration of mobile phones and related services- e.g. M-PESA – provided by the private sector in the country (GSMA, 2010, TCRA, 2011). Currently, citizens are willing and demand to engage the Government in business activities such as paying taxes and applications for loans are typical evidences.

The results provide an interesting theoretical insight. The fact that citizens indicated that they want more sophisticated services show that usefulness is a strong factor in eGovernment adoption theories. As predicted in TAM (Davis, 1989), adoption will happen when citizens perceive that eGovernment services are useful to them. In this study we observed that useful eGovernment services are those with interact and transact features. Otherwise, the services are less useful, thus

may attract low adoption. This is a valuable insight in the designing of adoptable eGovernment initiatives in Tanzania. That is, citizen adoptable eGovernment initiatives in Tanzania will be those with services that allow citizens to reliably interact and transact with the government. Accordingly the government needs to deploy eGovernment services with such features. This will enhance the citizens' adoption of eGovernment initiatives in the country.

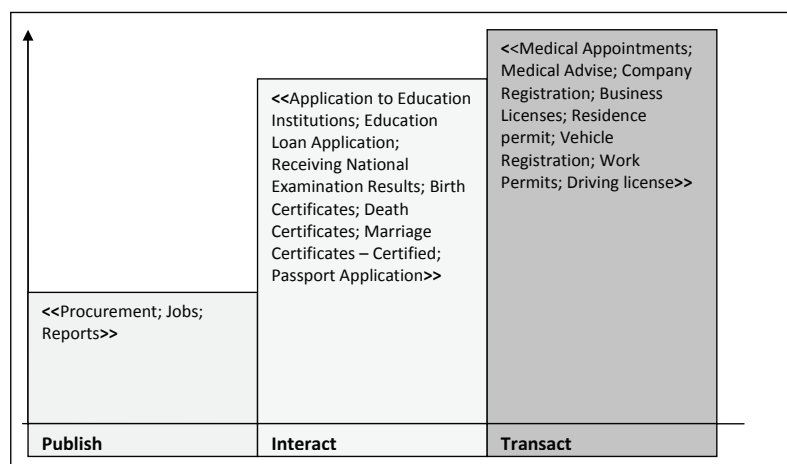


Figure 2: Mapping of citizen demanded e-Government services on stages of evolution in Tanzania (adopted from InfoDev, 2002)

6. Conclusion

In this study we argue that the designing of adoptable eGovernment initiatives is determined by the extent to which the initiatives accommodate the requirements of the Citizens. We therefore aimed at identifying types and stages of eGovernment services that citizens in Tanzania want. Our results show that citizens in Tanzania wish to receive eGovernment services related to 1) Education Services, 2) Government Certificates, 3) Government Information, 4) Healthcare services, 5) Passport Application, and 6) Tax Payment. The services should focus more on developing services at interact and transact stages of eGovernment evolution. Although our results are from Tanzania, they may be relevant to other developing countries. However, further research is recommended to test the results in other contexts.

Appendix 1: Summary of selected codes

Code	Open Coding	Focused Coding
EAP	Application to Education Institutions	Education Services
EL	Education Loan Application	
ER	Receiving National Examination Results	
CB	Birth Certificates	Government Certificates
CD	Death Certificates	
CM	Marriage Certificates - Certified	
PRC	Government information - Procurement	Government Information
JOB	Job Information	
REP	Reports	
HAPP	Medical Appointments	Healthcare services
HADV	Medical Advise	
PASSP	Passport Application	Passport Application
COMR	Company Registration	Tax Payment
BUSL	Business Licenses	
RESP	Residence permit	
VHCR	Vehicle Registration	
WRKP	Work Permits	

References

- Ajzen, I. (1991), 'Theory of planned behavior', *Organizational Behavior and Human Decision Processes*, Vol. 50 , pp.179-211
- Cap Gemini Ernst & Young. 2004, 'Online availability of Public Services: How is Europe Progressing?' Web based Survey on Electronic Public Services. Report of the Fourth Measurement, European Commission.

- Accessed on December, 2010, from:
http://ec.europa.eu/information_society/eeurope/i2010/docs/benchmarking/online_availability_2006.pdf
- Carter, L & Belanger, F 2005, 'The Utilization of EGovernment Services: Citizen Trust, innovation and Acceptance factors', *Information Systems Journal*, Vol. 15 (1), pp. 2-25
- Cook, M. 2002, What Citizens Want From eGovernment. CTG EGovernment Publications. Center for Technology in Government, University at Albany, SUNY Accessed on 20 Oct, 2010, from: Available at www.ctg.albany.edu/publications/what_citizens_want.htm (accessed on June 15, 2009).
- Davis, F. D. 1989, 'Perceived usefulness, perceived ease of use, and user acceptance of information technology', *MIS Quarterly*, Vol. 13(3), pp 319–340
- Rogers, E.M. (2003), *Diffusion of Innovations*, 5th Ed. The Free Press, New York, NY
- Dimitrova D.V., & Chen, Y. 2006, 'Profiling the Adopters of EGovernment Information Services: The influence of Psychological Characteristics, Civic Mindedness, and Information Channels', *Social Science Computer Review*, Vol. 24, pp. 172-188.
- GSMA 2010. What Makes a Successful Mobile Money Implementation? Learnings from M-PESA in Kenya and Tanzania. Accessed on 20th November, 2011, from: http://www.gsmworld.com/documents/m-pesa_case_study.pdf
- InfoDev. 2002, The EGovernment Handbook for Developing Countries: A project for InfoDev and The centre for Democracy and Technology, Retrieved October 2, 2009 from <http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan007462.pdf>.
- Kamal, M.M. (2006) 'IT innovation adoption in the government sector: identifying the critical success factors'. *Journal of Enterprise Information Management*, Vol. 19 (2), pp.192 - 222
- Kiwango, P., 2009, Serikali Mtandao: Semina ya Wabunge 25 April 2009. United Republic of Tanzania. Dar es Salaam, Tanzania
- Margetts, H., 2006, 'EGovernment in Britain—A Decade On', *Parliamentary Affairs* Vol. 59 (2) , 250–265
- Mutagayhwa, B., Kinyeki, C., & Ulanga, J., 2007, A Review of EGovernment Related Interventions in PSRP Phase I and Advice on a Strategy Framework Towards PSRP Phase II, POPSM.
- Ndou, V. 2004, 'EGovernment for Developing Countries: Opportunities and Challenges', *The Electronic Journal on Information Systems in Developing Countries*, Vol. 12 (1), pp. 1-24.
- Sabherwal, R., Jeyaraj, A., & Chowa, C., 2006, 'Information System Success: Individual and Organizational Determinants', *Management Science*, Vol. 52 (12) , pp. 1849–1864
- Shackleton, P., Fisher, J., & Dawson, L. 2006, EGovernment services in the local government context: an Australian case study, *Business Process Management Journal*, Vol. 12 (1) , pp.88 - 100
- Shahzad, H. & Sandhu, W, Y. 2007, eGovernment Services in Pakistan. Masters thesis, Lulea University of Technology, Sweden.
- Straus, L. A., & Corbin, M. J., 1998, *Basics of qualitative research: techniques and procedures for developing grounded theory*. Sage Publication
- TCRA, 2011. Quarterly Telecom Statistics. Accessed on 28 September, 2011, From. <http://tcra.go.tz/publications/telecomStatsMarch11.pdf>
- UN. 2010, *EGovernment Survey 2010: Leveraging eGovernment at a time of financial and economic crisis*. United Nations, New York.
- URT. 2008, *Tanzania eGovernment Strategy*, Dar es salaam, Tanzania.
- Yonazi, J.J. 2010, *Enhancing the Adoption of eGovernment Initiatives in Tanzania*. PhD Thesis, University of Groningen.
- Yonazi, J, Sol, H and & Boonstra, A., 2010, Exploring Issues Underlying Citizen Adoption of eGovernment Initiatives in Developing Countries: The Case of Tanzania. *Electronic Journal of eGovernment* Vol 8 (2) 2010, pp. 176-188
- Yonazi, J., Sol, H.& Boonstra, A. 2008, Developing a framework for assessing adoptability of citizen-focused eGovernment initiatives in developing countries: the case of Tanzania; Exploratory phase results. Proceedings of the 8th European Conference on eGovernment, Lausanne, Switzerland July, 2008.

eReadiness and eGovernment With Respect To Citizens' Participation and Involvement: Towards a Citizens' Inclusive eReadiness Assessment Model

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Abstract: The advancements in the ICT and internet technologies challenge governments to engage in the electronic transformation of public services and information provision to citizens. The capability to reach citizens in the physical world via eGovernment platform and render a citizen-centric public sector has increasingly become vital. Thus, spending more resources to promote and ensure that all members of society are included in the entire spectrum of information society and more actively access government online is a critical aspect in establishing a successful eGovernment project. Hence, involving and engaging the citizens at the initial stage of eGovernment process starting with the eReadiness assessment is a high priority to ensure eGovernment reaches all the citizens regardless of geographic dispensations, economic, social and political status, age, language, or access to the Internet. People with low income, women, youth, disabled, disadvantaged and those living in rural areas should systematically benefits from newer technologies. Therefore, when pursuing eGovernment, it is imperative to conduct a comprehensive eReadiness assessment with a greater focus on direct citizens' participation and involvement, as citizens are primarily a key player for eGovernment projects success and mostly the key main constituents for whom the eGovernment projects are undertaken by governments. Although many eReadiness tools have been developed by various agencies and individual researchers, these tools fall short of addressing citizens stakeholders participation and involvement as a critical component of the eReadiness equation. This paper therefore looks at how eReadiness has been defined over the years, presents and discusses the eReadiness and eGovernment interlinked relationship, reviews the existing eReadiness tools and applies the case study to present eReadiness model incorporating the citizens' engagement, participation and involvement dimension.

Keywords: eGovernment; eCommerce; eReadiness; ICTs and internet

1. Defining eReadiness

Existing literature reveals that the first efforts in defining eReadiness were undertaken in 1998 by the Computer Systems Policy Project (CSPP) (Mutula & Van Brakel, 2006) when they developed the eReadiness assessment tool known as Readiness Guide for Living in the Networked World, where eReadiness is defined with respect to a community that had high-speed access in a competitive market; with constant access and application of information and communications technologies (ICTs) in schools, government offices, businesses, healthcare facilities and homes; user privacy and online security; and government policies which are favourable to promote connectedness and use of the network (CSPP, 1998). Consequent to the first eReadiness definition, Centre for International Development (CID) at Harvard (2000) with the support of International Business Machines (IBM) (CID, 2000) and World Bank and World Economic Forum (Kirkman, Osorio, & Sachs, 2002) came up with the same definition as CSPP 1998. In the year 2000 as a stand out against the measures that focus on community's readiness for participating in the networked world, Asian Pacific Economic Cooperation (APEC, 2000), McConnell International (MI) (Popova et al., 2005) and Association of Southeast Asian Nations (ASEAN, 2001) developed a similar, but diverge definition by defining eReadiness as the degree to which an economy or community is prepared to participate in the digital economic world. Subsequently, several eReadiness definitions have emerged through efforts of development agencies, research organizations and individuals; such as (International Telecommunication Union (ITU), 2003; Southern African Development Community (SADC), 2002; Nchoucri et al, 2003; Docktor, 2002; Corrocher and Ordanini, 2002; Haan, 2004; Chen and Wellman, 2003; Hüsing and Selhofer, 2004; Losh, 2004; Vehovar, et al, 2006; Vaezi et al, 2007). These authors in summary define eReadiness as the ability to pursue value creation opportunities facilitated by the use of the Internet and information communication technologies (ICTs). The definitions of eReadiness generally exhibit the degree to which a society is prepared to participate in the digital economy with the underlying concept that the digital and knowledge economy can help to build a better society. Regardless of a country's level of development, readiness is assessed by determining the relative standing of its society and its economy in the areas that are most critical for its participation to the

networked world. However, eReadiness can be a relative concept and it could be defined differently depending on each country's priorities and perspective (InfoDev, 2002).

Measuring eReadiness is a complex and multi-faceted phenomenon and there is no objective test of eReadiness, (Tsoetsi, 2009). Nonetheless, specially designed assessment tools based on an accessible and manageable set of socio-economic variables are useful in deriving the state of eReadiness. Numerous assessment tools that gauge how ready a society or economy is to benefit from ICTs are available world wide. They differ in their goals, strategies and results, For example, The Global Information Technology Report uses the Networked Readiness Index (NRI) as the main assessment tool. The instrument covers a total of 115 economies which are compared based on the three component indices which covers, (a) the market environment, infrastructure, political and regulatory environment for ICT offered by a given country or community; (b) the readiness of the community's key stakeholders - individuals, business and governments; and (c) the usage of ICT among these stakeholders. EReadiness assessment is a pre requisite to the implementation of eGovernment and is necessary to serve as a useful indication to developing countries for planning ahead, the success of eGovernment largely depends on how well the eReadiness assessment has been conducted.

2. The impact of eReadiness on eGovernment

The globalisation of the world economic affairs is driven by a revolution in ICTs which presents greater opportunities for governments world wide to improve public sector efficiencies and service delivery to all stakeholders of eGovernment, manage and use resources prudently, reduce corruption, increase transparency, empower citizens through access to information, strengthen democratic institutions and local communities, achieve press freedom and address other development difficulties. Whilst, effective deployment of ICTs across a wider society and economic spectrum is necessary for eGovernment implementation, successful eGovernment projects cannot be realised without a prior and comprehensive eReadiness assessment (Moatshe et al, 2010), which assessment citizens are an important stakeholder.

The main goal of eGovernment is to improve citizen access to government information and participation and in the governance process. In this respect, eReadiness assessment is crucial in identifying, outlining and understanding the key and relevant factors for eGovernment development (e.g. infrastructure, accessibility, legal and regulatory framework, collaborations, determining vision, strategy, and priorities), this enables governments to pursue achievable milestones for eGovernment, (Docktor, 2002). Therefore eReadiness assessment is pre-requisite to pursuing eGovernment hence eGovernment has a dependency relationship to eReadiness as exhibited in Figure 1 below.

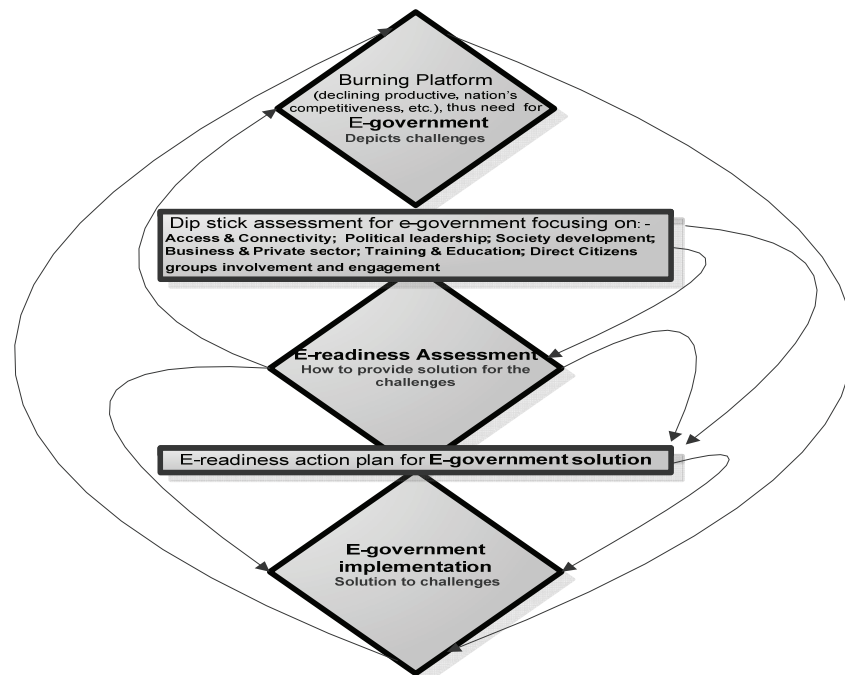


Figure 1: Model for success dependency on eReadiness assessment

The model highlights that prior to implementing eGovernment, there would be a burning platform in the nation, as in the case of Botswana; declining rankings in global competitiveness, labour market and public sector inefficiencies, escalating unemployment and crime, declining quality of life and reduced trust in government. These challenges coupled with advancement in ICTs and Internet globally, invariably compel governments to initiate eGovernment as transformative reform. In this pursuit, a government would firstly have to conduct a dip stick eReadiness assessment to facilitate strategy formulation, preparation of action plan and implementation of the action plan towards an eGovernment solution (Moatshe and Mahmood, 2011; Moatshe et al, 2010). The overriding objective of the readiness assessment process is to determine how best a country can leverage on ICTs to serve its citizens and maximise its participation in the global digital economy and efficiently meet its economic and social progress and growth.

eReadiness enables effective implementation of eGovernment and it lays the foundation to determine the eGovernment level the nation is read for, hence, inappropriately conducted eReadiness will hamper eGovernment project's success. The model shows how both eReadiness and eGovernment are interlinked and that it would be inappropriate to implement eGovernment without adequately conducting an eReadiness assessment.

The next section presents the review of existing eReadiness tools.

3. Review of existing eReadiness tools

For the past two decade there has been a massive explosion of research on eReadiness by many agencies, research organisations and individuals, which studies led to development of various eReadiness models. These research bodies and individuals are: (APEC, 2000; CSPP, 1998; IDC, 2000; 2001; ITU, 2003; 2006; SIBIS, 2003; UNCTAD, 2000; 2003; SIDA, 2001; CIDCM, 2001; Bridges.org, 2001; 2005; EIU, 2000; 2003; The Mosaic Group , 1998; McConnell-WITSA, 2000;2001; Info Dev, 1990;2010;; ASEAN, 2001; UNESCO, 2006; UNDP, 2001; OECD,1999;2005, United Nations, 2003; 2005b; OECD, 1999; 2005; KAM, 2002; SADC, 2002; Choucri et al, 2003; Vaezi and Bimar, 2007; Mutula and van Brakel, 2006; Esselaar et al, 2001;Docktor, 2004; Chen and Dahlman, 2003; Kirkman et al, 2002; Robinson and Crenshaw, 2002; Bui et al, 2003; Archibugi and Coco, 2004; Barua et al,1999; Corrocher and Ordanini, 2002; Moatshe et al 2010)

Although a number of studies have conducted a review of the existing eReadiness tools (Hourali et al, 2008; Choucri et al, 2003; Menou and Taylor, 2006; Vaezi and Bimar, 2009), Bridges.org conducted a broader review on major and widely used tools namely; CSPP, CID, APEC, WITSA, Mc Connell CIDCM and MOSAIC. The review classified these eReadiness tools and models into two main category perspectives of; e-society and e-economy, and further identified that the main measurements used in these studies are; (a) questionnaires; (b) statistical methods; (c) industry best practices; and (d) historically based analysis, (Bridges.org, 2001: 2005). On a boarder scale the eReadiness tools measure the following five factors;

Physical infrastructure and access;—the telecommunications infrastructure, including teledensity and Internet access, number of ISPs; bandwidth, pricing, and reliability;

ICT usage—levels of usage throughout the society, including homes, businesses, schools, and government; Internet activities undertaken by individuals in the last 12months, preference of public online services for citizens;

Human capacity—education and literacy, ICT skill levels, and vocational training, percentage of schools with website, connected to the internet and learners computer ration;

Policy environment—the legal and regulatory environment affecting ICT sector and ICT usage, including telecommunications policy, trade policy, e-commerce taxation, universal service provisions, consumer protection, and privacy; and

ICT economy—the size of ICT sector, Gross National Income (GNI) per capita (US\$), expenditures for research and development (R&D) (% of GDP) and population.

A further comparison of eReadiness assessment models, (Bridges.org 2001:2005; eReadiness Guide, 2002) developed a composite eReadiness framework divided into the following focus areas:

- Access and Connectivity
- Training and Education
- Public Administration and Political leadership
- Business and Private Sector Initiatives
- Society Development

A full picture of major eReadiness tools and what they measure is given in table 1 below:

Table 1: eReadiness assessment models and tools by agencies and individuals

Model /Tool	Descriptions and Details	Model Measurements
UNESCO	United Nations Education and Scientific Cultural Organisation (UNESCO, 2006)	Education, that is, schools with website, internet connectivity and learners/ students computer ratio.
APEC	The Asian Pacific Economic Cooperation (APEC, 2000)	E-commerce Readiness
UNDP	United Nations Development Programme (UNDP,2000:2001)	Infrastructure and access
CSPP	Computer Systems Policy Project (CSPP, 1998:2004)	Existing Infrastructure
SIDA	Swedish International Development Cooperation Agency (SIDA,	Mainly SWOT analysis of a nation
ITU	International Telecommunications Union's Internet Country Case studies (ITU, 2003:2006)	Telecommunications
CID	The Centre for International Development at Harvard University (CID, 2004)	Infrastructure, E-society, Policies, Digital Economy, Education and government
SADC	Southern African Development Community (SADC, 2002)	Pervasive information infrastructures that leverage on ICT applications.
McConnell International	McConnell International in collaboration with World Information Technology and Services Alliance (WITSA, 2000:2001)	Infrastructure, Digital Economy, Education and government
EIU	The Economist Intelligence Unit (EIU, 2003:2006)	E-business Readiness Connectivity, IT infrastructure, Legal and regulatory environment, social and cultural infrastructure
MQ	Mosaic Group-global diffusion of Internet project (MQ, 1998)	Internet growth and usage
USAID	United States Agency for International Development (USAID)	Access, Government and people
International Survey on E-commerce	World Information Technology and Services Alliance (WITSA, 2000)	Market readiness for E-commerce , economic factors and regulatory environment
IDC	World Times / IDC 's Information Society (IDC, 2000)	Infrastructure pillars, Internet, Computer use and E-commerce
SIBIS	Statistical Indicators Benchmarking The Information Society (SIBIS, 2003)	Telecommunication, access, security and Trust, education, work, employment and skill. E-health and transport
KAM	World Bank, Knowledge Assessment Methodology (KAM, 2002)	Educated and skilled population efficient, innovative systems, research centres, universities and consultants
United Nations	United Nations (2003:2005)	Basic enabling indicators; eGovernment; infrastructure and access; use of ICT by households and individuals; education and eGovernment

Info Dev	InfoDev and Pyramid Research's Information Infrastructure Indicators (InfoDev, 2002)	Infrastructure world wide with emphasis on developing countries
Model /Tool	Descriptions and Details	Model Measurements
UNCTAD	United Nations Conference on Trade and Development (UNCTAD, 2001:2005)	Infrastructure, Internet, ICT connectivity, access and usage, policy, expenditure relative to Basic enabling indicators (GDP, R&D, GNI, population)
ASEAN	and Association of Southeast Asian Nations (ASEAN, 2001)	E-society
OECD	Organisation for Economic Cooperation and Development (OECD, 2000:2005)	Infrastructure, ICT use and access, E-business and basic indicators
C AND R	Crenshaw and Robinson's Cyber-space and Post-Industrial Transformations: a Cross National Analysis of internet Development (C AND R, 2002)	ICT development, political openness, mass education, presence of sizable services sector, teledensity, , inequality and population density
Choucri et al, 2003	Focuses on eReadiness domains and cluster	Access, capacity and opportunities
Mutula and van Brakel, 2006	Emphasises on information readinesss and e-business	Enterprise, human resource, ICT,external environment and information access
Docktor, 2004	Focuses on e-business	Connectivity, e-leadership, information security, human capital and e-business climate
Bui et al, 2003	Connectivity and e-business	Infrastructure and access, e-business development
Vehovar et al, 2006	Focuses on enablers	Basic enabling indicators
Esselaar et al, 2001	Education and business	Education and e-business development
Kirkman et al 2002; Haan,2004;	Connectivity, use and e-services	Infrastructure, access to and use of ICT by households, individuals and schools; eGovernment
Chen & Dahlam, 2003	Connectivity, e-services and enablers	Infrastructure and access; eGovernment and basic enabling indicators

Whilst the Bridges.org framework covers key eReadiness issues derived from the detailed analysis of major existing and widely used tools as mentioned above, The framework similarly with the other major tools which gave rise it, fail to incorporate the "*citizens involvement, engagement and participation*" in the eReadiness assessment equation. Thus create a knowledge gap which this study aims to fill.

4. Empirical study

Empirical study was conducted in Botswana, where the survey questionnaire was used as the main method of data collection ((Vos et al, 2007; Daun et al, 2002; Miles and Huberman, 1994; Ramsden and Bennet, 2005) to establish if eReadiness assessment conducted by Botswana government recognised and involved citizens in conducting eReadiness assessment and how the engagement of citizens or lack of has impacted on the ongoing eGovernment implementation in as far as citizens' adoption of eGovernment is concerned.

4.1 Sampling of target participants

The sample was drawn from the following various locations; (a) Gaborone and Francistown (cities); (b) Selebi-phikwe and Lobatse (town); (c) Serowe, Palapye, Mahalapye, Maun, Molepolole, Ramotswa, Tlokweng and Mogoditshane (urban villages); (d) Mmathubudukwane, Mabalane, Sikwane and Mmanoko (sub villages). The criterion for selecting the areas was influenced by

population densities, where it is reported that over 50% of the population lives within a 100KM radius of Gaborone, (Central Statistics Office, 2011). Other areas outside the given radius were considered for their sizable population numbers.

The Botswana district administrative structures were relied upon to target respondents with opinion leadership gained through societal settings, economic, political, social structures and/or employment established relationship with ordinary citizens. These comprised of the following persons and representatives; welfare officers, Police, customs, immigration, district councils staff, district land boards staff and members, health staff, church denominations, politician across party lines, business community, industrial and trading, primary, secondary school teachers as well as senior secondary students, vocational, colleges, universities' staff and students, sporting bodies, tribal administration staff, including chiefs and headmen, village development committees (VDCs), village extension teams; district development committees, operators of information centres and reading rooms, village health workers, including home based care health service providers, various government ministries and departments, farmers groups, non governmental organisations (e.g. sports, youth, women). Individual citizens whose opinion is valued by societies and communities they live within, examples are; Intellectuals, professionals, retired civil servants, sports legends, retired politicians; former members of land board members and village development committees were also targeted.

4.2 Survey results and discussions

A total of 700 hundred questionnaires were issued out to the target respondents and 621 people responded giving a response rate of 89%. The questionnaire required respondents to rate variables investigated on a scale of 1 to 5, 1 being "strongly disagree" and 5 being "strongly agree". Interviews were conducted with 9 key government and eGovernment project officials, and private stakeholders. Further investigations were held with other opinion leaders to highlight the citizens' readiness and perceptions, attitudes, preparedness and expectations of the eGovernment innovation. The below table gives a statistical representation of eReadiness and eGovernment parameters probed.

Table 2: Perceived eReadiness factors that impact on eGovernment adoption by citizens

EReadiness and EGovernment variables investigated	Combined scores					
	1 and 2		3		4 and 5	
	No.	%	No.	%	No.	%
Factors highlighting citizens Involvement and engagement on eReadiness and eGovernment						
Citizens' engagement on eReadiness assessment achieved	401	65	98	16	122	20
Sufficient stakeholder consultation on eReadiness and eGovernment.	428	69	72	12	121	19
Citizens specific needs solicited and incorporated on eReadiness action plan for eGovernment solution	531	86	11	2	79	13
Use of opinion leaders and other representative structures on eGovernment change programmes	380	61	201	32	40	6
Identification of citizens groups and tailored information	483	78	107	17	31	5
Targeted Citizens awareness and education on eGovernment	324	52	198	32	99	16
Availability of citizens' media channels on eGovernment	148	24	82	13	391	63
Citizens continuously updated on eGovernment progress	399	64	133	21	89	14
There is adequate citizens awareness on the benefits and importance of eGovernment	453	73	102	16	66	11
Factors influencing and/ or impeding Citizens alignment with eGovernment						
Adequacy of citizens engagement level on eGovernment and eReadiness	99	16	124	20	398	64
Full knowledge of eGovernment creates better understanding to embrace eGovernment	185	30	140	23	296	48
Citizens' misconception about eGovernment (e.g.	97	16	335	54	189	30

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believe that eGovernment is just an IT project							
Perception amongst government employees that eGovernment will lead to staff retrenchment	221	36	182	29	218	35	
Engagement of citizens representative structure on eReadiness better informs citizen centre eGovernment action plans	136	22	83	13	402	65	
EReadiness and EGovernment variables investigated	Combined scores						
	1 and 2		3		4 and 5		
	No.	%	No.	%	No.	%	
Factors highlighting citizens Involvement and engagement on eReadiness and eGovernment							
EGovernment awareness especially in the villages	166	27	96	15	359	58	
Change agents and opinion leaders awareness on eGovernment	207	33	103	17	311	50	
Those who have heard about eGovernment but lack full information	193	31	114	18	314	51	
Factors impacting on citizens' propensity to innovate the eGovernment solution							
Inadequate citizens' involvement and engagement on eReadiness and eGovernment have resulted in negative attitudes on eGovernment project	77	12	5	1	539	87	
Lack of citizens engagement has impacted their lack of knowledge on the need for eGovernment benefits thereto	154	25	68	11	399	64	
Opinion leaders' ability to inform eReadiness assessment and publicise eGovernment to citizenry not exploited	100	16	88	14	433	70	
There is no widely shared information on eGovernment via social structures and citizens centred media channels	86	14	42	7	503	80	
Citizens trust their opinion leaders and easily follow them	72	12	175	28	374	60	
Citizens value for engagement and participation	45	7	6	1	570	92	
Citizens' reluctance to engage due to lack of consultation and engagement on both eReadiness and eGovernment processes	85	14	43	7	493	79	
Involvement of communities enables information sharing and flow	52	8	139	22	430	69	

The study (65% of participants) revealed that citizens were not engaged and involved in the eReadiness assessment and hence did not inform the action plan for eGovernment implementation, similarly when conducting eReadiness the broader stakeholder had not been sufficiently engaged save for a smaller of 19%. This resulted in lack of awareness by implementers on citizens specific needs, e.g. provision for assistive technology for the physically challenges persons and currently there is re no public training and awareness campaigns running parallel with the ongoing eGovernment implementation, this is notwithstanding the availability of media channels and communicative and consultative for a such as district and village committees, elected representatives, tribal authority, educators and other opinion leadership structures, and as well as citizens accessible media like radio, television, Botswana daily news and other private newspapers

Significant majority (73%) of participants lacked awareness on benefits and importance of implementing eGovernment. The highly inadequate citizens' engagement has deprived citizens' full knowledge on eGovernment benefits which would otherwise have created better understanding to embrace eGovernment. Hence, the misconception and perception that eGovernment is just an Information Technology project and is a way by government to retrench staff.

The outcomes reveal predominantly the lack of adequate citizens involvement, engagement and participation in both the eReadiness assessment and the on going eGovernment project in Botswana and broader stakeholder consultation not sufficiently achieved. These have led to citizens' negativity about eGovernment, with lack on knowledge on eGovernment constituting 64% and neutral cases

11%, whilst citizens' opinion leaders have been consulted, the study reveals that their capability and capacity to inform eReadiness and publicize eGovernment is at 70%. Worth noting is the opinion leaders relate very closely to citizens as mentioned in section 3.1 above, thus citizens trust and could more easily follow their views and decisions. A significant percentage (92%) shows that citizens value engagement and participation on issues that affect them. The main conclusion from the study (70%) is that lack of citizens' consultation and involvement on eReadiness and continuously in implementing eGovernment has yielded reluctance to engage and align with eGovernment. Failure to involve citizens in eReadiness assessment and eGovernment is inherently risky as government may implement a project based on what they think citizens want.

5. Importance of citizens involvement and participation in eReadiness and eGovernment

Citizens' involvement and engagement in eGovernment and eReadiness assessment creates awareness, knowledge and provide opportunities for citizens to understand alternative methods and available options, and say what they want. This ensures that as eReadiness and eGovernment initiatives are undertaken and new delivery channels rolled out, needs citizens are closely addressed. Primarily eGovernment exists to serve the citizens, therefore a platform that adequately encompasses citizens' voice through awareness, active participation and engagement is an important component of eReadiness. Policy statements and laws in themselves may not be sufficient to bring about the change that is sometimes necessary to transform business practices for the greatest possible diffusion of ICTs needed to usher eGovernment (UNDP-APDIP, 2005; Labelle, 2005).

Governments must first understand variables that influence citizens' adoption of eGovernment in order to take them into account when delivering services online (Moatshe et al, 2010; Ranerup, 2007; Mofleh and Wanous, 2008) and revealed in the case study, citizens highly value engagement. While government sets policies, people need to be involved to inform these policies, and eReadiness assessments, can be helpful to provide sources of information for visioning eGovernment, especially if more focused on people instead of only on documenting hard evidence of technical diffusion. On the basis of the outcome of the case study and argument raised above that a new eReadiness model incorporating citizens' involvement is introduced and discussed below.

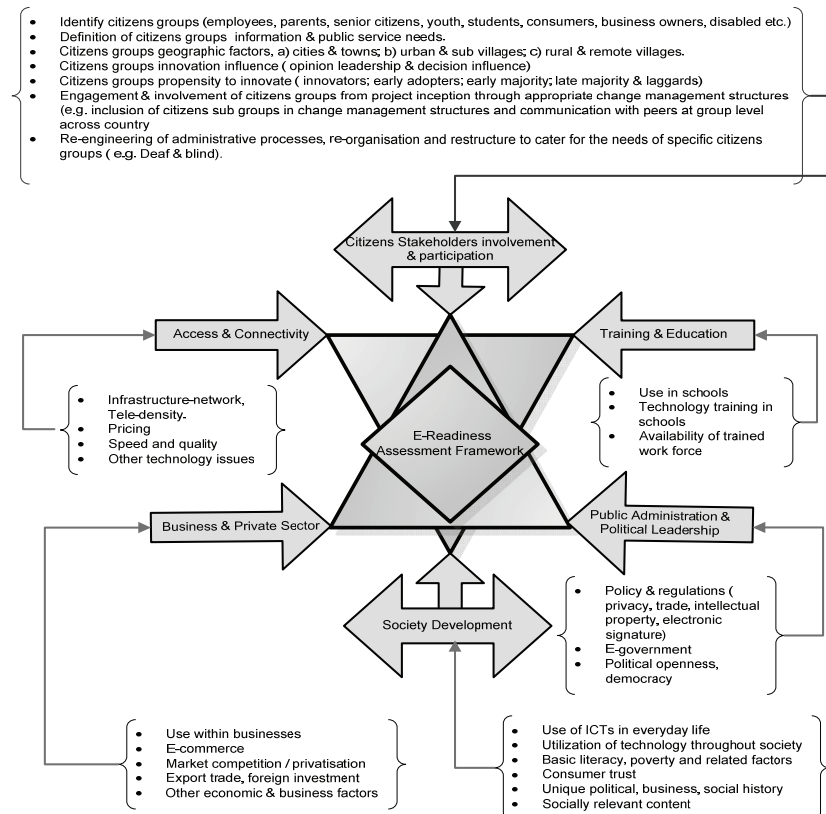


Figure 2: Integrated eReadiness assessment model {Citizens Involvement and Participation Inclusion}

Focus of the new model is that inclusion, involvement and participation of citizens in the eReadiness assessment is fundamental to a successful eGovernment implementation as all citizens participants have a view of what they would like themselves, their children and their communities to have in the future, citizens' inclusive eReadiness assessment enables government to;

- Prioritise citizens awareness as a critical component of the change model, notably so with eGovernment through eReadiness assessment that focuses on citizens
- Provide information and education for citizens to make evaluation of the eGovernment change process.
- Identify, define and classify citizens' segments groups information needs and prioritise accordingly;
- Identify and effectively use the communication media within the population social networks
- Appropriately gauge citizens' capacity and propensity to accept an innovation and maximise the use of opinion leaders, change agents and other citizen organs likely to be effective in disseminating information across a wider societies and communities.

The greater awareness amongst consumers and users creates understanding, trust and accelerates adoption, (Carter and Belangor, 2005; Choudries and Dwivedi, 2004; Rogers, (1996:2006)). The integrated disposition study of trust has revealed that lack of trust hinders citizen's adoption of eGovernment services. This is so, as technology continues to become ingrained in society. Citizens' perceptions of the accuracy and reliability of e-services will increase exponentially in importance (Belangor and Carter, 2008), hence the introduction of the new model.

6. Conclusion

Successful eGovernment projects not only attract citizens who are already connected to the internet, but must equally be able to move people online who are not already there. An eGovernment system is useful to the extent to which citizens actually use the service; hence, the critical issue is to bridge the gap between what is offered and what is used. Since eGovernment provision is for every citizen, to bridge the gap and maximise the value of eGovernment to citizens, nations undertaking eGovernment should allow citizens to partake in deciding the eGovernment solution they are ready for and the eReadiness assessment has to achieve this milestone right from the initial assessment and planning process and continuously so with eGovernment implementation. Consequently, citizens' involvement becomes a critical component of both eReadiness and eGovernment programmes. Then way forward is to recognise and capture citizens' involvement and engagement amongst the important pillars of eReadiness assessment. On this basis, the study herewith presents a new integrated eReadiness assessment model incorporating the "*Citizens Stakeholders Involvement and Participation*" as the sixth pillar in addition to the existing pillars, namely; (1) *Access and Connectivity*; (2) *Public Administration and Political Leadership*; (3) *Business and Private Sector*; (4) *Training and Education*; and (5) *Social Development*. This is necessary to ensure eReadiness for eGovernment makes citizens active partakers and avoids providing eGovernment amiss.

References

- Archibugi, D., & Coco, A. (2004). A new indicator of technological capabilities for developed and developing countries. *World Development*, 32(4), 629–654.
- Asian Pacific Economic Corporation (APEC). (2000). *E-commerce readiness assessment guide* [Online]. Hong Kong, China. Available at: <http://www.Ecommerce.gov/apec> [Accessed March 2010].
- Association of Southeast Asian Nations (ASEAN). (2001). *E-ASEAN Readiness Assessment* Bridges.org. (2001). *Comparison of eReadiness assessment models* [Online]. Available at: <http://www.bridges.org/eredainess/tools.html> [Accessed May 2010].
- Centre for International Development (CID), Harvard University. Losh, S. C. (2004). Gender, educational, and occupational digital gaps. *Social Science Computer Review*, 22(2), 152–166.
- Computer Systems Policy Project (CSPP). (1998). *Readiness Guide for Living in the Networked World* [Online]. Available at: <http://www.cspp.org> [Accessed October 2009].
- Consulting and Audit Canada. (2004). *Transformation for the digital age: The development of Botswana's National ICT policy. Preliminary report for consultancy for the formation of a national information and communication technology policy technical bid* (pp. 1–81). Toronto: Government of Canada.
- Corrocher, N., and Ordanini, A. (2002). Measuring the digital divide: A framework for the analysis of cross-country differences. *Journal of Information Technology*, 17, 9–19.
- Docktor, R. (2002). *EReadiness in 2002: Defining and achieving your e-fitness goals* [Online]. Available at: <http://www.ip3.org/pub/docktor.htm> [April 2010].

- Economist Intelligence Unit Limited. (2001). *The economist intelligence unit/pyramid research eReadiness rankings* [Online]. Available at: <http://www.ebusinessforum.com/index.asp> [Accessed March 2010].
- International Data Corporation (IDC). (2000). *World Times Information Society Index*. Framlingham, MA [Online]. Available at: <http://www.idc.com> [Accessed November 2009].
- International Telecommunication Union (ITU). (June 2005). *Measuring digital opportunity*. Paper presented at the WSIS Thematic Meeting on Multi-Stakeholder Partnerships for Bridging the Digital Divide, Seoul, Republic of Korea.
- Moatshe, R. M., Mahmood. Z. (2011): Strategies for eGovernment implementation in developing countries: the case study of Botswana government. 11th European Conference on eGovernment (ECEG) 2011, 16-17 June Ljubljani, Slovenia.
- Moatshe, R. M., Mahmood. Z. and Antonopoulos, N. (2010): SDEAT; A Six Dimensional Framework for Assessing EReadiness for EGovernment Projects. Proceedings of the 15th IBIMA Conference Cairo, Egypt.
- Mofleh, S, Wanous, M, Strachan, P (2008) Developing Countries and ICT initiatives; lessons learnt from Jordan's Experience; EJISDC (2008) 34, 15-1-17.
- Mosaic Group. (1998). *The Global Diffusion of the Internet Project: An Initial Inductive Study* [Online]. Available at: <http://www.mosaic.unomaha.edu> [Accessed April 2010].
- Mutula, S. M, and van Brakel, P. (2006). An evaluation of eReadiness assessment tools with respect to information access: Towards an integrated information rich tool. *International Journal of Information Management*, 26, 212–223.
- Organization for Economic Co-operation and Development (OECD). (2003). *A proposal for a core list of indicators for ICT measurement*. Paris: OECD [Online]. Available at: <http://www.oecd.org>.
- Robison, K. K., and Crenshaw, E. M. (2002). Post-industrial transformations and cyberspace: A cross national analysis of internet development. *Social Science Research*, 31, 334–363.
- Statistical Indicators Benchmarking the Information Society (SIBIS). (2003a). *Benchmarking eGovernment in Europe and the US*. European Commission [Online]. Available at: <http://www.sibis-eu.org> [Accessed May 2010].
- United Nations Conference on Trade and Development (UNCTAD). (2003). *Information and Communication Technology Development Indices*. New York & Geneva: United Nations [Online]. Available at: <http://measuring-ict.unctad.org> [Accessed May 2010].
- United Nations Development Program (UNDP). (2001). *Human development report 2001*. New York: Oxford University Press [Online]. Available at: <http://hdr.undp.org/reports/global/2001/en/pdf/techindex.pdf> [Accessed May 2010].
- United Nations, (2003). *UNGlobal EGovernment Survey 2003*. New York: UN [Online]. Available at: <http://www.un.org> [Accessed April 2010].
- United Nations. (2005b). *Measuring ICT: The global status of ICT indicators, Partnership on Measuring ICT for Development*. New York: UN [Online]. Available at: <http://www.un.org> [Accessed April 2010].
- United Nations Development Programme-Asia Pacific Development Information Programme (UNDP-APDIP) – 2005; ICT Policy Formulation and e-Strategy Development; Elsevier a Division of Reed Elsevier India Private Limited Website
- Vehovar, V., Sicherl, P., Hüsing, T., and Dolnicar, V. (2006). Methodological challenges of digital divide measurements. *The Information Society: An International Journal*, 22(5), 279–290.
- World Information Technology and Services Alliance (WITSA). (2000). *International Survey of E-Commerce* [Online]. Available at: <http://www.witsa.org/papers/EcomSurv.pdf>

Implementing eGovernment Projects: Challenges Facing Developing Countries

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Abstract: Globalisation of world societies, cultures, politics and economies is compelling countries world over to initiate and reinvent government systems to deliver efficient and effective services to citizens, businesses and other agencies. This transformation and reform in the way governments operate presents significant challenges and issues that developing countries need to fully take into account when implementing eGovernment projects. Governments in developing countries face challenges different from those in developed countries, challenges include amongst others; limited resources with competing national priority needs; lack of interoperability standards for build up of eGovernment systems; and limited and weak telecommunication platforms resulting into inaccessibility and poor internet connections speed and efficiency. The potential for eGovernment in developing countries remains largely unexploited despite that information and telecommunication technologies (ICTs) offers considerable potential for sustainable development of eGovernment. Developing countries in comparison to developed countries lack in (1) history and culture; (2) technical capabilities; (3) Infrastructure; (4) e-citizen development and (5) public service focus. There is digital divide between developed and developing countries, not withstanding that the world is in reality a one globally competitive market. Hence a need for eGovernment research specifically focused on developing countries. This paper takes both the theoretical and empirical approaches to address the study, a theoretical approach is used to explore and discuss the general challenges faced by developing countries with a view to create adequate awareness of the challenges to give focus and enable developing countries to capture in their plans effective strategies to tackle these challenges when formulating implementation programmes. Whereas the empirical approach applies a case study based research conducted in Botswana mainly not to provide the solution at this point, but rather to highlight that though there are generic challenges facing developing countries, there is however, no one size fits all solution as some challenges are peculiar and specific to countries and would need differentiated approaches and strategies. Further the paper discusses the present benefits of eGovernment to developing countries in three broader categories of; political and public sector administration benefits; economic benefits; and social and cultural benefits. Presentation of how developing countries can benefit from implementing eGovernment projects coupled with awareness of what challenges to address and specification of challenges per each country is expected to assist developing countries to set appropriate goals for pursuing eGovernment, define and set clear vision, mission and priorities for eGovernment as well as determine the eGovernment their nations may be ready for.

Keywords: eGovernment, e-citizens, ICTS, internet

1. Introduction

This paper discusses eGovernment challenges and barriers facing developing countries and establishes the need for eGovernment research with a focus in developing countries. The paper then presents specific challenges facing eGovernment implementation in Botswana, then makes a comparison of developing and developed countries and finally looks at how developing countries can benefit from eGovernment projects.

2. Barriers and challenges facing developing countries

eGovernment in developing countries encounters a number of challenges and barriers that can impede its success and deprive implementing nations the benefits, opportunities and good economic and development prospects that came along with the initiative. A number of authors have outlined the barriers and challenges facing eGovernment implementation in developing countries, such authors include inter alia; ((Schwere and Deane, 2003; Ebrahim and Irani, 2005; Raman et al, 2007; Wagner et al, 2003; Ndou, 2004; Molla and Licker, 2004; Reffat, 2006; Schuppan, 2008; Chen et al, 2006; Heeks, 2003; Jennex and Amoroso, 2002; InfoDev, 2002; Ramon, Garcia and Pardo, 2005; Al-Busaidy & Weerakkody, 2009; Sharifi and Zarei, 2004; and Akman et al, 2005))

The review of the literature on the above authors has enabled us to outline, refocus and state the key challenges and barriers that developing nations in implementing eGovernment must be aware of and take them into account when planning for eGovernment initiatives. These barriers and challenges are:

Inadequate ICT infrastructure development

This covers;

- Basic infrastructure to reap benefits that come with newer technologies and communication tools.
- Unreliable and inadequate bandwidth, internet network capacity and communication networks.
- Inadequate access channels and remote access such as satellite receivers and other ICT access points.
- Weak and inefficient IT infrastructures, architecture policies, definitions in systems documentation, lack of integrated systems capabilities owing to incompatibility and complex legacy systems, software and applications.

Lack of supportive legislation and policy environment

This covers;

- lack of simplified regulations and procedures, e.g. electronic e-filing with other government agencies, lack of e-procurement
- Lack of laws and policies to outline publications of government information.
- Lack of cyber laws, electronic signatures and authentication laws limit and stifle the eGovernment initiative.

Security and protection of privacy

- Lack of protection of information systems assets and control of access to information.
- Lack of information privacy protection laws, rules and policies
- Lack of privacy and confidentiality values when creating and maintaining websites, personal data privacy is crucial to eGovernment security.
- Lack of security of governments' hardware and software infrastructures, and are mostly prone to threats from intruders, viruses, hackers, unrestricted physical access to computer rooms giving unauthorised access to systems and information.
- Security solutions and applications come at a higher cost and are characterised by inadequate risk management and security programmes

Organisational, managerial and inadequate technical skills

- Inability to manage the project size
- Lack of appreciation of the complexity of the public sector and lack of linking organisational goals and multiple, complex and conflicting goals
- Lack of effective change management programmes
- Lack of education and marketing strategies.
- Limited IT and technical skills and inadequate training programmes.
- Lack of adequate strategies, vision and management strategies.

Information and data challenges

- Inability of government to exchange required information across various arms of government through the use of eGovernment services.
- Sometimes the information and data quality is deficient.
- Lack of established knowledge management protocol processes and tools to ensure storage, usage, easy retrieval of strategic information used in the decision making process

Digital divide

- The digital gap between developing and developed countries and lack of appropriate tailored strategies to bridge the gap within available resources.
- Lack of understanding the urban and rural digital divide within countries and mapping of appropriate strategies to bridge the gap.

- Lack of alternative solutions for digital government development e.g. kiosks and multi-channel access.

Lack of effective partnerships and collaborations

- Private sector lacking confidence, trust and credibility in government.
- No effective partnership models

Inadequate funding

- Lack of adequate resources.
- High operational cost e.g. IT costs are high in developing countries, systems development, installation, operation and maintenance costs.
- Lack of funding partnership with private sector.

Whilst barriers and challenges of eGovernment to developing countries have been outlined in detail, research in the case of eGovernment implementation for Botswana has revealed that though eGovernment challenges are generic, but they differ in degree of complexity from one country to another given different levels of readiness and in some cases some challenges are unique to countries thus, require a differently tailored approach. In the next section the outcome of the Botswana study are presented.

3. Challenges facing eGovernment implementation in Botswana

A study has been being carried in Botswana in December 2009 to January 2010 and further data collection done from July – October 2011 in Botswana. This covered perusal of eGovernment related data records and reports on policy and strategy; conducting semi structured interviews with relevant stakeholders and carrying out a population based questionnaire surveys (Vehovar and Lesjak, 2007; MaCgregor, 2004; Teo and Ranganathan, 2004; Pokharel, 2005) amongst citizens in Botswana across the following locations: Gaborone and Francistown; Lobatse; Serowe; Palapye; Mahalapye; Maun; Molepolole; Ramotswa; Kanye; Mochudi, Mahalapye; Mogoditshane; Artesia; Mmathubudukwane; Mabalane; Sikwane; Mmanoko. The choice of these locations was guided by higher population densities and they represent cities, towns, urban villages, sub urban villages and small and less developed areas (Botswana population census, 1981; 1991; 2001; 2006; 2011). The interviews and focused discussions were done with representatives of the Botswana Telecommunications Authority (BTA); Botswana Telecommunications Corporation (BTC); Botswana Post; District Councils Chairpersons; Ministry of Transport and Communication, responsible for eGovernment projects; The eGovernment project team; Public Service Performance Coordination office, private sector representatives and other relevant stakeholders. The findings are outlined in table 1 below;

Table 1: eGovernment challenges in Botswana

Nature of the challenge	Characteristics of the challenges
Assistive Technology Inclusion	Lack of coherent policies to include people with disability into the main stream of eGovernment that is, lack of assistive technology interventions for the disabled e.g. visually impaired, hearing, dexterity and mobility, language and communication or learning difficulties.
Shortage of electricity	There are areas in Botswana which do not have electricity to power households ICTs connectivity, where available connection fees are not affordable. Electricity is in short supply and is imported from South Africa. These consequently hinder the supply and uptake of eGovernment services.
Vastness of the population	The population is vastly scattered across the country making it expensive to provide eGovernment services. Population numbers in some areas are uneconomical to justify provision costs, thus constraints equitable eGovernment access to all citizens.
Citizens apprehensiveness to technology	Whilst literacy levels are between 80% –90%, this is inconsistent with ICTs literacy and uptake across the population, e.g. internet penetration stands at 6% , broadband at 1%, PC penetration 3% in 2009 and 2010. Most survey and interview participants d in the survey opted to complete the questionnaires manually than electronically. Highlighting familiarity with the manual process. Of the 1000 questionnaires, over 350 were distributed electronically and only 55 responses were obtained electronically. Mostly even people with tertiary qualifications preferred manual questionnaire completion.

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	Also where free access to ICT is offered e.g. Sesigo offering computers and internet in public libraries and reading rooms in selected villages across Botswana do not use internet. I-partnership scheme set by government for employees to obtain advances to buy computers, did not bear much fruit, only 20 computers have been bought through the scheme to date.
Nature of the challenge	Characteristics of the challenges
Inability to meet deadlines	The below listed legislations were targeted for enactment in 2005/06, it is hoped some will be presented to parliament in June 2012. data protection electronic signature e-commerce freedom of information act/access privacy Other examples outside eGovernment are Science University (BIUST) construction, Oodi College of Applied Art (OCAAT), and other projects not completed on time resulting in costs overruns. BIUST project completion was early 2011, but will only be completed in 2013.
Botswana's economic structure	Highly dependent on diamonds, (40% of GDP). Since recession started in 2007 to date, Botswana operated on deficit as USA and Europe could no longer sufficiently buy Botswana diamonds. Major projects (BIUST) were scaled down and major development put on hold. This even constrains the financing of eGovernment.
Improper co-ordination of eGovernment projects	eGovernment falls under the Ministry of Transport and Communication (MTC) it has a project team, but change management programs are handled by public service performance coordination office in the Ministry of State. Legislation projects are handled by the Attorney General Chambers. Security and data protection issues are vested in the permanent secretary in the MTC. Software, hardware accusation and integration issues are a responsibility of Department of Information and Technology (DIT). This setup creates cumbersome structure with unclear reporting lines resulting in lack of poor co-ordination and ineffective execution and delivery of eGovernment initiatives.
eGovernment team lacks autonomy and control	Depend on government official to expedite policies necessary to enable the team to drive eGovernment agenda objectively. The project team does not control funding; they depend on ministries as there is no centralised budget.
Improper eGovernment Budget and rationalizing of resources	Ministries and departments are still developing own portal. Budgeting for eGovernment is currently done through individual ministry votes. Whilst the government has established that P506 million (£55 million) is needed to finance eGovernment, it is unclear as to what will be the source of funds as there is no central budgeting for eGovernment currently. Whilst significant milestone has been achieved to provide international connectivity for undersea cables, EASSy (East Africa Submarine Cable System) and South Atlantic-3/West African Submarine Cable (SAT-3/WASC), which provides a band wave for the country, millions of pula are needed to provide for the last mile connectivity. Some officials interviewed commented that funding may have to come from ministries budget savings, which is unsustainable given the current budget deficit. In areas where public access centres exists management structure are a challenge e.g. Nteletsa Projects haphazardly managed by Village development committees (VDCs)
Management of public access projects (Nteletsa)	The management of these centres is vested on the VDCs with ineffective management structures to sustain the centres These VDCs are elected through the Kgotla (public) forum per each village every 1 to 2 years with no basic skill or experience capability required to run the office. Across constituencies VDCs are known for poor structures and most participants have revealed that VDCs are deficient.
Citizens readiness	Citizens were involved and did not participate on e-readiness assessment and are not ready for eGovernment. No reports available to show participation of citizens and other stakeholders such as ISPs, Local IT companies, government employees. A very few select private public actors have been consulted. Broadly private

	sector is not sufficiently engaged to be active driver of eGovernment. Existing communicative and consultative citizens' access platforms have not been utilised. Change management programs have not been initiated despite that other eGovernment functions are already operational, hence there is; No information shared widely with citizens , thus low awareness. Most citizens in the village especially do not have access to government website Citizens inability to appreciate the value of eGovernment (socio, economic and political) EGovernment is threatened by citizens' resistance.
Nature of the challenge	Characteristics of the challenges
Political ownership and law to establish eGovernment	Other than executive political leadership, politicians are not engaging in eGovernment. Politicians are a critical and influential link between citizens and government so their actions exacerbate citizens' scepticism and hampers eGovernment adoption. Establishment of legislation to implement eGovernment will help enable statutory ownership and future certainty for the funding and maintenance of the initiative.
Unfavourable Comparative cost and pricing.	Compared with South Africa, Botswana's significant trade partner (where 70% of the consumables in Botswana are imported from South Africa). EGovernment indices with regards to e-participation, e-decision making, e-consultation, and e-information, Botswana ranks very low with mostly all accept e-information being virtually non existent Botswana has got the highest mobile data plan rate on prepaid services compared to its neighbouring countries (e.g. Namibia- 0.50/MB; Zambia- 1.30/MB; Zimbabwe- 1.30/MB; South Africa- 1.40/MB; Botswana- 1.50/MB which is the highest from the list) Affordability levels for ISPs fees in Mauritius, Namibia and South Africa are very high compared to Botswana.
Government data network (GDN)	Frequent down time of GDN Insufficient band waves of government data network led the slow roll out of boarder control system
Inappropriate targeting and projections.	Botswana targets for service oriented government (client centre service delivery) offering vertically integrated online transactions and information access to citizens by 2010, and fully transformed and seamless government providing a horizontal service delivery by 2016. In 2012 not even availing all government information has been achieved. In spite of the 31st December 2010 target.

4. Need for eGovernment research and focus on developing countries

According to Akman, et al (2005) during the last decade a revolution in information and communication technologies (ICTs) is prevalent and is not only changing the daily lives of people but equally changing the characteristics of the interaction between governments and their citizens. These changes, in turn, are rapidly being transformed into new forms of government, namely eGovernment. The various services that different governments are using to reach their users electronically depending on the level or stage of eGovernment development and the users' needs, also creates an expectation as the adoption of ICTs and related practices in the commercial sectors, such as e-commerce and the diffusion of the internet among the general population have led to rising levels of comfort and familiarity with the technologies in many contexts, for example, (communicating with people, electronic marketing and academic activities). This increased expectations of citizens that the public sector organisation will provide services similar to those in the commercial sector with the same level of agility, effectiveness and efficiency, Ebrahim and Iran (2005) The current era of technological advancements that are taking place world over, introduces a new rationalization in the public sector through the use of modern information and communications technologies (ICTs) and the increasing use of ICT tools and applications is leading to transformation shifts in public policy, processes and functions (United Nation EGovernment Survey, 2008)). In developed countries, the services are offered in a self service mode through internet portals that become a single point of interaction for the citizens to receive services from a larger number of departments, (Bhatnagar, 2003). For example, countries such as Canada, Singapore and New Zealand are among the top twenty eGovernment leading countries. In Singapore, citizens can pay parking tickets, job seekers can search for

employment and public trustees can file an application for estate administration using opportunities provided by eGovernment, (Ngulubane, 2007) However, the case is different in developing countries, online services counter may operate in a department offering services related only to that department as opposed to a single point of interaction through internet portal, (Bhatnagar, 2003). Businesses in developing countries face challenges different from those in developed countries, (Molla and Licker, 2005). The potential for eGovernment in developing countries remains largely unexploited despite that ICTs offers considerable potential for sustainable development of eGovernment. Developing countries in comparison to developed countries lack in (1) history and culture; (2) technical capabilities; (3) Infrastructure; (4) e-citizen development; (5) public service focus, (Ndou, 2004; Chen, et al, 2006). There is digital divide between developed and developing countries, notwithstanding that the world is in reality a one globally competitive market. These developments present the need for continuous research into eGovernment to continually present new and innovative approaches to address traditional problems of government services utilizing the internet and World Wide Web, (Reffat, 2006). Accordingly, government leaders and officials are increasingly aware of the potential of eGovernment to improve the performance of government organisations and provide potential benefits to their citizens and business partners, (Ebrahim and Iran, 2005). This therefore requires developing countries to re-think their systems and seek to improve competitiveness globally and eGovernment is the direction to go. In a nutshell, developing countries need eGovernment to address their challenges. The main differences between developed and developing countries are detailed in the below table 2: Developed and Developing Countries Comparisons;

Table 2: Developed and developing countries comparisons

	DEVELOPED COUNTRIES	DEVELOPING COUNTRIES
History, Culture and Democracy	Mature public service and economy developed early, immediately after independence. Economies growing at constant rate, efficiency and productivity increasing, high standard of living. Long history of sustainable culture and democracy, sound and transparent governance structure, policy and rule	Economy not well developed and government not usually specifically defined. Static economic growth, inefficiencies and declining productivity, low standard of living. History, culture and democracy not very strong and sound. Less transparent policy and rule.
Technical and Proficient Personnel	Have technical capability and ability, however needs to continually enhance by hiring younger professionals. Adequate abilities and financial resource to outsource, current staff have the proficiency and technical skills to define requirements for development.	Do not have staff and/ or have very limited in-house staff with technical capability and ability. Have limited abilities and constrained financial resources to outsource. Current staff may not have the proficiency and skills to well defined specific requirements.
ICT Infrastructure and Development	Sufficient infrastructural development High levels of internet access and related information and communication technologies (ICTs)	Insufficient and bad current infrastructure development. Very low levels of internet access and related ICTs.
Citizen Focus	High computer literacy coupled with high internet access. Though privacy issues and digital divide exist, but the levels are very low and relatively insignificant. Active citizens participation in governmental policy-making process, facilitated by strong history and democratic culture created overtime	High computer illiteracy with low internet access. Very few citizens know how to operate computers. Citizens are reluctant to trust online services, privacy issues and digital divide existing levels are highly significant. Non-existent or less citizens' participation in policy making process. Relatively, less experienced democratic system with undesirable history and culture.
Public Service Human Resource Perspective	Transformed, client-centric public service Decent computer literacy and dedicated resources. EGovernment has become part of the day to day public service delivery facilitation process and is highly placed and as an on-going priority.	Public service less or not client- centric and transformed Low computer literacy and dedication of resources. EGovernment not embraced and acknowledged as a high priority due to lack of knowledge on the issue.

Constructed and Modified using (Ndou, 2004; Chen, et al, 2006)

5. How eGovernment can Benefit Developing Countries

eGovernment research is necessary and developing countries can benefit from implementing eGovernment projects. These benefits modelled in figure 1 below, classified and presented and classified into three main categories, namely, 1) Political and public administration, 2) Economic benefits, and, 3) Social and cultural benefits

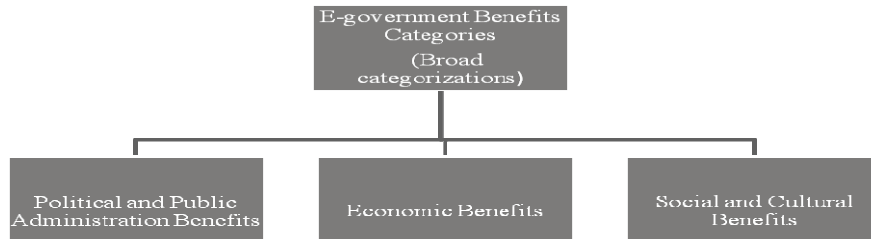


Figure 1: eGovernment conceptualized benefits model

Political and public administration benefits

- Increased citizens' mindshare and engagement in the political and administrative processes, through delivery of clear and useful information online in a vibrant and interesting manner, as well as attract participation in online public consultations and feedback, (Infocomm, 2006).
- EGovernment facilitates and builds participatory democracy, (Clift, 2004) and helps build trust between government and citizens which is fundamental to good governance. ICTs can help build trust by enabling citizens' engagement in the policy process, promoting open and accountable government.
- Enhances and strengthens democracy and equality for all citizens irrespective of their geographic locality, political, social and economic classes, this is achieved through reach and equitable access, effective representation in decision making process, transparency, interaction and engagement. Example are; e-voting, e-participation and e-consultation.
- Enhances capacity and synergy in governance processes, as well as enabling public sector competency development. Here, synergies are created through shared data, processes and systems; enrichment of public officers work experience through innovative use of existing eGovernment structures and technology platforms, which foster innovative exploitation of ICTs and internet in the public service, (Infocomm, 2006).
- EGovernment can develop the strategic connections between public sector organisations and their departments, and make communication effective between government levels, i.e. central, city and local. This connection and communication improve cooperation, facilitates the provision and implementation of government strategies, transactions and policies. Further this will better the use and running of government processes, information and resources, (Ebrahim and Irani, 2003; Cabinet Office, 2000; Heeks, 2001).

Economic Benefits

- EGovernment enhances national competitive advantage by enabling economic competitiveness through sectoral transformation, (Infocomm, 2006).
- EGovernment reduces and helps to prevent corruption, as it enables better policy outcomes, effective and efficient management of the public sector, (Bhatnagar, 2003). Many governments have chosen to go online in departments such as customs, income tax, sales tax/ VAT and property tax which have a large interface with citizens or businesses and are perceived to be more corrupt.
- It enhances centralisation of data management which can be used for improving audit and analysis hence makes decisions traceable.
- Improves efficiency in country resources management, utilization and lead to cost savings. ICTs enables efficiency improvement in mass processing tasks, thus saves on time and resources; Also internet based applications can generate savings on data collection and transmission, provision of information and communication with customers.

- The savings generated by the appropriate use of eGovernment could lead to much efficiency. The potential savings in terms of citizen and government employee time would lead to improved productivity in other areas, (Yen and Evans, 2005), Social and Cultural Benefits
- Network and community creation, which promotes culture of openness, greater accountability and through this, helps advance democracy.
- EGovernment diminishes geographic distance and place communication barrier through equitable access to information and bridges local urban digital divide within the nation, as well as regional and international digital divide between across societies, communities, nationalities and nations.
- EGovernment creates an e-society; An e-society is a globally competitive, knowledge and information based society where communication and interaction is unlimited and takes place across nationalities and societies irrespective of ethnicity, beliefs and cultures. This is made possible through the use of ICTs and the internet, (Wesso et al, 2004).

6. Conclusion

eGovernment is necessary for developing countries to strengthen the performance of government, public sector administration and facilitate efficient and effective state administration and governance. It is a necessary pre-requisite for economic, social and political development of nations. Developing countries are increasingly investing heavily in eGovernment implementation initiatives, whilst their efforts are supported to bring them closer to developed countries, it must equally be appreciated that the implementation programmes will become more significant and rewarding if the eGovernment barriers, challenges, issues and opportunities facing developing nations are understood, diagnosed and successfully factored in the vision, mission and strategies. Hence knowledge and awareness of these barriers and challenges is of greater significance. Further more, it must be noted that developing countries have peculiar issues different from developed countries, which issues have great impact in the success of eGovernment projects.

References

- Akman, I., Yazici, A., Mishra, A., and Arifoglu, A. (2005) EGovernment: A Global view and an empirical evaluation of some attributes of citizens; *Government Information Quarterly* 22 (2005) 239-257
- Al-Busaidy, M. and Weerakkody, V. (2009); EGovernment diffusion in Oman; a public sector employees perspective. *Transforming Government; People, Process and Policy*, Vol 3, No 4, 2009, pp 375- 393.
- Almarabeh, T. and AbuAli, A. (2010); A General Framework for EGovernment; Definition Maturity Challenges, Opportunities, and Successes; *European Journal of Scientific Research* ISSN 1450-216X, Vol 39, No 1 (2010), pp 29-42
- Bhatnagar, S. (2003): Transparency and Corruption; Does EGovernment help? *Indian Institution of Management*.
- Chen, Y.N., Chen, H.M., Huang, W. and Ching, R.K.H. (2006) EGovernment strategies in Developed and Developing Countries: An Implementation Framework and Case study. *Journal of Global Information Management*, 14 (1), 23-46, January-March 2006, 23
- Ebrahim, Z. and Irani, Z. (2005) EGovernment Adoption, Architecture and barriers; *Business Process Management Journal*, Vol 11, number 5, 2005, pp 589-611
- European Commission (2006) Breaking Barriers to EGovernment: Case Study Report; Overcoming Obstacles to Improving European Public Services; Deliverable 2
- Heeks, R. (2003); Most eGovernment-for-developing projects fail: how can risks be reduced? *Institute for development Policy and Management*
- Hwang, M.S., Tali, C., Shen, J.J. and Chu, Y.P. (2004); Information and Security. *International Journal*, Vol 15, No 1, 2004, 9-20.
- Infocomm Development Authority of Singapore (2006): Singapore: *A world class eGovernment*
- Molla, A. and Licker, P.S. (2005) E-Commerce Adoption in Developing Countries: A Model and Instrument; *Information and Management* 42 (2005) 877-899
- Ndou, V. (2004) EGovernment for Developing Countries: Opportunities and Challenges; *Electronic Journal of Information Systems in Developing Countries*. EJISDC (2004) 18, 1, 1-24
- Ngulubane, P. (2007) The Nature and Accessibility of EGovernment in Sub Saharan Africa; IRIE; *International Review of Information Ethics*, Vol 7 (09/2007)
- OECD (2005); EGovernment for Better Government ISBN 92-64-01833-6-OECD.
- Ramon, J, Garcia, G and Pardo, T.A (2005); EGovernment success factors: Mapping practical tools to theoretical foundations. *Government Information Quarterly* 22 (2005) 187- 216.
- Reffat, M (2006) Developing a Successful EGovernment: University of Sydney, NSW 2006, Australia
- Schuppan, T. (2009) EGovernment in developing countries; experiences from sub-saharan Africa. *Government Information Quarterly* 26 (2009) 118- 127.
- Schware, R. and Deane, A. (2003) Deploying eGovernment programs; the strategic importance of "I" before "E" *MCB VP limited. Info* 5, 4 2003, pp 10- 19.
- Seifert, J.W and McLoughlin (2008) ; State eGovernment Strategies; Identifying Best Practices and Applications

- Sharifi, H. and Zarei B (2004): An adaptive approach for implementing eGovernment in I.R. Iran: *Journal of Government Information* 30 (2004) 600-619
- Sign, S.H (2003) Governments in the Digital Era and Human Factors in EGovernment
- Signore, O., Chise, F., and Pallotti, M. (2005) EGovernment Challenges and Opportunities: *CMG Italy- XIX Annual Conference* 7-9 June 2005
- Spremic, M., Simurina, J., Jakovic, B. and Ivanov, M. (2009) EGovernment in Transition Economies: World Academy of Science, *Engineering and Technology* 53, 2009
- The Working Group on EGovernment in the Developing World (2002) Roadmap for EGovernment in the Developing World (10 Questions EGovernment Leaders Should Ask themselves): *Pacific Council on International Policy*.
- UN (2005). UN Global EGovernment Readiness Report 2005 from EGovernment to E-inclusion.: United Nations Department of Economic and Social Affairs, Division of Public Administration and Development Management. New York
- UNPAN Portal Project (2009) Modernising Botswana Government in the Digital Era: Botswana Experience, CPS/ UNPAN Workshop Johannesburg, South Africa
- UN- EGovernment Survey (2008): from eGovernment to connected governance
- Wagner, C., Cheung, K., Lee, F., and Rachael, P. (2003); Enhancing eGovernment in developing countries; managing knowledge through virtual communities; *The Electronic Journal of Information Systems in Developing Countries* (2003) 14, 4, 1- 20.
- Wesso, H., Naidoo, R. and Neville, M. (2004) Technology EGovernment and Economic Development: A Background Paper to Inform the Strategy of the Centre for E-innovation
- Wong, K., Fearon, C., and Philip, G. (2007) *Understanding eGovernment and e-governance: stakeholders, partnerships and CSR*

A new Population Targeted Survey Based Sampling Method (NPTSBS- Model)

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Abstract: Methodology is a cornerstone of research as it looks at how the researcher constructs knowledge in his/her works that is, how the research is conducted. Within the broader research methodology framework, research is mostly conducted to collect data on any particular phenomenon and critical to gathering data is the sample selection. Therefore sampling becomes the most critical part of any population survey based research. This is because when conducting 'research study', in most surveys, access to the entire population is impossible, therefore applying the right sample using appropriate sampling technique gives confident results that reflect extremely closely to those that would have been obtained had the entire population provided the data. Given that selecting a sample is a crucial step in any research project as is rarely practical, efficient or ethical to study the whole population as aforementioned. This paper looks at the various literatures and techniques applied, arguments raised for preferring a particular approach as opposed to other and how various researches have approached the issue of what constitutes an appropriate sample size. The literature reveals different divergent views on sampling selection and sample size and this position has prompted this paper to investigate further the sampling selection approaches and ultimately develop and present a new population targeted survey based sampling model (NPTSBS- Model), which model is based on the methods, approaches and techniques employed by the researcher when carrying out data collection for a PhD programme on eGovernment implementation for Botswana government. The NPTSBS model is a hybrid of probability and non probability models; it comprises cluster, stratified random and purposive sampling techniques. The fundamental question being addressed in the model is that given the various characteristics of a population, *"How can the research ensure a balanced representative or most inclusion of the various composite characteristics of the population within the envisaged sample selection."* Although the new model is developed based on an eGovernment research survey, it is however broadly flexible, adaptive and applicable in any survey based research irrespective of the discipline, though minor adjustments or variations may be necessary as the case may be.

Keywords: eGovernment, methodology, sample selection, techniques and methods

1. Introduction

In today's globally competitive environment there is a high demand to obtain relevant and accurate information to support strategies, plans and decisions to transform both private and public organisations. Increasingly research data has become crucial to achieving these important aspects. This paper therefore is an offshoot of the methodology process followed in the ongoing doctoral research on eGovernment implementation for Botswana government. This paper therefore critically reviews the existing literature on sampling selection and sample size, and detail out the sampling process and approach followed in the eGovernment survey research for the Botswana case study, then finally introduces and discusses the New Population Targeted Survey Based Sampling Model (NPTSBS-Model). This is done to highlight the steps that are necessary to follow to ensure that a chosen sample is representative of the entire population which steps provide an empirical substantiation and validation for the NPTSBS- Model proposed. However, the paper does not discuss the outcome of the research; it is limited to applying the case study to support the methodology process, sampling decisions and selection in practical terms.

2. Literature review on sampling

Sampling is the act, process or technique of selecting a representative part of a population. Simply put, it is the process of selecting a sample from a population using a special sampling technique called Sampling. When conducting a research study, in most surveys, access to the entire population is impossible, (Marshall, 1996; Punch 1998; Mason 2010). Sampling can be probability and non probability. Probability methods include; random sampling, systematic sampling, stratified sampling and cluster sampling, Whereas non probability methods includes convenience sampling, judgemental sampling, quota sampling and snowball sampling (Blaxter et al, 2003; Blaikie, 2009)

The review of various literatures on sampling is more into explaining the various types of probability and non probability sampling techniques and their suitability for a given case (Barreiro and Albandoz,

2001; Bryman, 2008; Blaikie, 2009; Blaxter et al, 2003; Saunders et al, 2008; Punch, 1998). The literature does not shed much light into how both probability and non probability sampling can be combined to enhance sampling quality, and where an attempt is made the practical process and application of same is non-existent. For instance (OECD/ Dumais, 2008) suggests that when preparing any large scale survey, it is desirable to do a feasibility study, as this will help to establish what survey step works well and what steps need improvement. Align to OECD is (Maxwell, 2008) that sampling should be guided by the rest of the research design and should not be made in isolation and that the feasible sampling decisions often require considerable knowledge of the setting studied and decision should be based on what works best. The key emphasis is that the researcher must make decisions as to which variables should be incorporated in the sample and establish the level as a basis for sample size (Bartlett II, et al, 2001).

In an attempt to guide sampling (Statistics Canada, 2003) allude that the main characteristics of a high quality sampling frame must be based on; relevance, accuracy, timeliness and cost aspect, whilst (Churchill and Iacobucci, 2002; Wilson 2006) presented a five step procedure for drawing a sample as; (a) define the target population; (b) Identify the sampling frame; (c) select a sampling method (d) determine the sample size and; (e) collect data from the sample. On the other hand (Doherty, 1994; Pentti, 2007) emphasize the aspect of location targeting, arguing that in some instances, geographical areas might first be selected, then dwellings within these areas, finally, people might be selected inside the dwellings. This subscribes to earlier position by (Watters and Biernacki, 1989) who posited that location sampling is the best known form of targeted sampling suitable when the target population is geographically concentrated. Here, the researcher ethnographically mapping the target population and conduct the study at the site identified.

Whilst, the above highlight literature helps to provide an emphasis guide sampling, the literature is inadequate by this study, on the combined use of probability and non probability sampling techniques in one case and the practical application thereto, hence a knowledge gap that this paper intends to fill. There is no existing survey that matches exactly the ideal picture of probability based sampling purported in the textbooks (Sarndal et al, 1992) and similarly so could be argued with the non probability. The reality is that there are inherent problems, which can be addressed by assuming some kind of a model, which model this paper posits that could be addressed through a hybrid model of probability and non probability sampling techniques.

3. Sample selection and sample size

Selecting a survey sample is a crucial step in any research project as is rarely practical, efficient or ethical to study the whole population as explained above, The decision about a sample size is not simple and straight forward, it depends on a number of factors and there is no one definitive answer to that, (Bryman, 2008; Blaikie, 2009). Mostly sample decisions are affected by factors of time and cost. Other literature suggest that sample size and sampling especially in qualitative research do not matter which view is refuted by (Onwuegbuzie and Leech, 2005) arguing that sample size and sampling scheme represent an active process of reflection.

Sampling in qualitative studies are generally much smaller than those in quantitative studies and there is a point of diminishing return to a qualitative sample and while there are other factors that affect sample size in qualitative study, researchers generally use saturation as a guiding principle during their data collection, (Mason, 2010). However, there is agreement by most researchers and writers that, quantitative researchers use complex mathematical formulae to make sample size is considerations and further that the sample is determined by the optimum number necessary to enable valid inferences to be made about the population, (Onwuegbuzie and Leech 2005; Marshall 1996; Mason 2010; Bryman 2008; Blaikie 2009; Punch 1998).

Some researches base the sample size on the margin of error that can be tolerated and in general there is a proposition that sample size decision must be made on a case by case basis. The argument is that, consideration should be based on a variety of goals to be achieved by a given study and other aspects of the research design and further that the basic characteristics of the population is ultimate in coming up with sample size (Bartlett II, et al, 2001; Maxwell, 2008; Churchill and Iacobucci, 2002).

These different divergent views on sample selection and sample size coupled with limitations of existing literature highlighted above prompted this paper to look at factors that are crucial to determine a population based sample and consequently a new sampling model for a population

targeted survey based sampling being introduced. The new model presented herein is a practical and empirically applied methodology based on the on going doctoral research on the eGovernment implementation for Botswana government. The model looks at and assesses the general population of Botswana from which a survey sample has been drawn. It has been found mainly that the population consists of various characteristics of groups of people with different socio-economic and political background, differing authority, independence and dependency levels, priorities, lifestyles, education, exposure and access to technology, these people are dispersed across a wider geographic spectrum of the country. Administratively, Botswana is demarcated into 28 regions classified as cities, towns, districts and sub districts where districts and sub districts comprise of main villages, sub villages, small villages and even the very remote areas (Botswana Central Statistics Office, 1981; 1991; 2001 and 2006).

4. Empirical study: Botswana case study

Nations in pursuit of eGovernment should aim to improve government processes and integrate the disadvantaged communities into the main stream of the socio, economic, political and global world. Fundamentally, eGovernment should reach all the people who need government services regardless of their location, age, status, language, or access to the Internet. The doctoral research investigates and facilitates understanding of key elements that can support or impede citizens' acceptance of an eGovernment innovation, and the challenges and barriers facing eGovernment establishment in developing countries, using the Botswana case study. The doctoral research intends to propose criteria to address these issues and develop new approaches and / or strategies to achieve successful implementation of the eGovernment project. Amongst the key focus areas of the broader study is gathering empirical data to understand the eGovernment barriers and challenges facing Botswana government, level of government preparedness and citizens' readiness for change.

Botswana is a middle income country whose population is dispersed across administrative districts as shown in *Table 1: Botswana population census by administrative divisions* and over 50% of the population lives within 100 km of Gaborone city (Botswana Central Statistics Office 2001: 2011) and approximately 70% of Botswana is a desert.

5. Sampling factors considered in the case study of Botswana

As aforementioned, the fundamental question being addressed using the Botswana population to model the new approach, that is given the various characteristics of a population, *"How can this research ensure a balanced representative or most inclusion of the various composite characteristics of the population within the envisaged sample selection."*

In pursuit of a representative sample, in addition to the population profiles identified as per Table 2, the study further examined more closely the geographic divisions and administrative structures of Botswana. Significantly high population numbers are concentrated around the following major capital areas which also have surrounding sub areas; Gaborone, Francistown, Molepolole, Mogoditshane, Maun, Selebi-Phikwe, Serowe, Kanye, Mahalapye, Mochudi, Bobonong, Orapa, Tutume, Masunga, Boteti and Ramotswa (*refer to table 2*).

It has also been observed that the Botswana district administrative divisions fall under local government district administration authority headed by District Commissioners per each of the 28 regions with specialised broad arms of authority. The three arms of district administration authority are the Tribal Administration, District Councils and Land Board Administration. A number of sub agencies are falling under each of these three arms of authority, refer to *Figure 1: Abridged District Administration Structure in Botswana, (Central Statistics Office, 2001)*.

Figure 1 shows the various authority levels and relationship chain of select people who represent ordinary citizens in the districts (at village levels) and whom citizens depend on daily for public services, interactions, guidance, mentoring and opinions. The following elements have been noted about the structure:

- These representative authority and subordinate structures are of various work / industry sectors, and other backgrounds, examples are; social workers, land board employees, educators, agricultural administrators, youth organisations and other sectors.

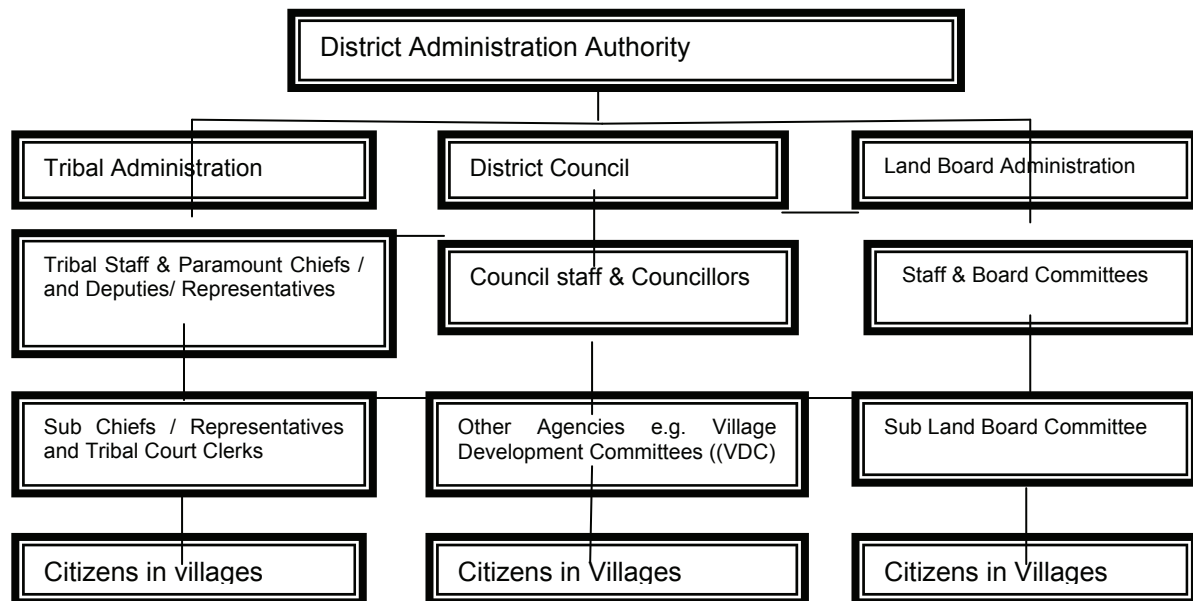


Figure 1: Abridged District Local Government Administrative Structures in Botswana

- Some of them, for example, members of Village Development Committees (VDCs), Sub land board committees in each district (main and sub villages) and Councillors are directly elected by citizens to represent them over a given term of every 2-5 years on a range of day to day matters that affect their life and well being.
- The chiefs (paramount and representative, at both district and sub districts levels), are perceived closer to the citizens as they interact with them more often and because chieftaincy is hereditary, knowledge and familiarity between the chiefs and people are established over a long period of time.
- As a result the relationships and representations necessitated by the administrative structure arrangement facilitates better understanding of citizens' behaviour trends, attitudes, expectations, fears, interest, needs, abilities and priorities. This enabled citizens to trust on their representatives, leaders and mentors and value their judgement and opinions.
- The structures are therefore considered by this study as appropriate to articulate closely the experiences and responses of the citizens in the respective districts (main and sub villages) on the eGovernment innovation and other broader issues, thus deemed appropriate for a representative sampling.

However, the administration structures, in the cities (Gaborone and Francistown and other towns) are different from the district structures. Therefore, it was necessary for the study to target the participants by industry sectors to ensure inclusion across economic and political setups.

In view of the above discussions on the population densities, district administration structures and industry sectorisation in the cities of Gaborone and Francistown, location based sampling decisions were made using both probability and non probability methods. This entails the use of statistical random number generator presented below.

6. Randomiser statistical tool

A table of 15 random numbers (figure 2 below) was produced using the statistical randomisation tool, according to the specifications (table 1) of a total of 30 areas selected using judgemental and /or purposive approach where cities, towns, urban villages, main villages, sub, small and rural villages were selected to have a balanced representation, high population numbers and the proximity (100KM radius of Gaborone) were also used a selection basis. The 100KM radius is in the south eastern part of Botswana where over 50% of the population is concentrated (Botswana Central Statistics Office, 1991; 2001; 2011). It worth noting, that more than three quarters (about 70%) of the Botswana is covered by the Kalahari desert (AfBD/OECD, 2008). Hence, the reason for highest population densities in the south eastern part of the country. These chosen locations were assigned unique numbering within a range of 16 to 45 to enable statistical random number generation and selection of

15 areas for drawing up the final sample. Numbers were randomly selected from within the range and duplicate numbers were not allowed. (<http://stattrek.com/Tables/Random.aspx#calculator>).

Table 1: Random number generator specifications

Name of Location	Unique Number Assigned	Description and Criteria for Selecting an Area
Gaborone	44	City with Largest population
Francistown	43	City with High population
Maun	45	Urban village and high population
Molepolole	18	Urban village, high and 100KM radius of Gaborone***
Mogoditshane	19	Urban village, high and 100KM radius of Gaborone***
Selebi-phikwe	22	Town with high population and outside Gaborone radius
Serowe	21	Urban village, outside 100KM radius of Gaborone
Kanye	27	Urban village, high and 100KM radius of Gaborone***
Mochudi	23	Urban village, high and 100KM radius of Gaborone***
Mahalapye	37	Urban village, outside 100KM radius of Gaborone
Palapye	25	Urban village, outside 100KM radius of Gaborone
Masunga	17	Urban village, outside 100KM radius of Gaborone
Tutume	16	Main village, outside 100KM radius of Gaborone
Orapa	42	Town with high population and outside Gaborone radius
Bobonong	24	Main village, outside 100KM radius of Gaborone
Ramotswa	36	Main village, outside 100KM radius of Gaborone
Boteti	28	Main village, outside 100KM radius of Gaborone
Lobatse	31	Town, high and 100KM radius of Gaborone***
Modipane	33	Sub village, 100KM radius of Gaborone***
Sikwane	40	Small village, 100KM radius of Gaborone***
Mabalane	20	Small village, 100KM radius of Gaborone***
Artesia	26	Rural area, 100KM radius of Gaborone***
Tonota	30	Main village outside 100KM radius of Gaborone
Moshupa	35	Main village, high and 100KM radius of Gaborone***
Mmanoko	28	Rural area, 100KM radius of Gaborone***
Gabane	29	Sub village, 100KM radius of Gaborone***
Kumakwane	38	Small village, 100KM radius of Gaborone***
Mmathubudukwane	34	Sub village, 100KM radius of Gaborone***
Malotwane	39	Rural area, 100KM radius of Gaborone***
Botatle	41	Small village, 100KM radius of Gaborone***

*** Note: over 50% of the Botswana population falls within the 100km radius of Gaborone.***

Figure 2 below presents computation parameters, random numbers results generated.

How many random numbers?	15
Minimum value	16
Maximum value	45
Allow duplicate entries	☐ False
Seed (optional)	
Calculate	

Random Computations generated 15 random numbers below

45 19 23 33 18 27 21 37 36 26 31 25 20 28 34

Random numbers above represent 15 locations selected by the randomiser

Figure 2: Random number computations and random number table

It worth noting that the randomiser excluded the cities of Gaborone and Francistown and given their significantly higher population structure and composition of various segment of the population and that most participants with decision making concerning eGovernment implementation reside in these cities, they were purposively included to the randomly generated sampling locations resulting in increase from 15 to 17 areas. The demographics presented in the next section constituted the final sampling localities.

7. Sample demographics

The research sample was drawn from the following cities****, towns***, urban villages**, sub and small villages*:

Gaborone and Francistown;**** (b) Lobatse***; (c) Serowe, Palapye, Mahalapye, Maun, Molepolole, Ramotswa, Kanye, Mochudi, Mahalapye and Mogoditshane** (d) Artesia, Mmathubudukwane, Mabalane, Sikwane and Mmanoko*. The main selected localities are positioned as reflected in Figures 3 below.



Source: The World Fact book 2007

Figure 3: Geographic position of main areas in Botswana considered for sampling.

As mentioned above, table 2 below provides the justification for selecting high population areas, as well as those within a 100KM radius of Gaborone for sampling randomisation.

Table 2: Botswana census results by administrative units

District	Capital	area (sq.km.)	population 1991-08-21 census	population 2001-08-17 census	population 2011-08-09 census
Gaborone Township	Gaborone	169	133,468	186,007	227,333
Francistown Township	Francistown	79	65,244	83,023	100,079
Lobatse Township	Lobatse	42	26,052	29,689	29,032
Selebi Phikwe Township	Selebi phikwe	50	39,772	49,849	49,724
	-	17	8,827	9,151	9,544
Jwaneng Township	-	100	11,188	15,179	18,063
Sowa Township	-	159	2,228	2,879	3,599
Southern District	Kanye	28,470	128,989	113,704	129,462
Orapa Township	Orapa		18,400	47,477	55,103
Ngwaketse West District				10,471	13,697
South East District	Ramotswa	1,780	43,584	60,623	92,843
Kweneng South District	Molepolole	31,100	170,437	189,773	256,833
Kweneng West District				40,562	47,841
Kgatleng District	Mochudi	7,960	57,770	73,507	92,247
Central Serowe/Palapye District	Serowe	31,381	128,471	153,035	188,174
Central Mahalapye District	Mahalapye	16,507	95,433	109,811	117,492
Central Bobonong District	Bobonong	14,242	53,558	66,964	70,806
Central Boteti District	Boteti	33,806	35,459	48,057	56,209

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Central Tutume District	Tutume	46,140	100,049	123,514	144,895
District	Capital	area (sq.km.)	population 1991-08-21 census	population 2001-08-17 census	population 2011-08-09 census
North East District	Masunga	5,120	43,354	49,399	59,829
Ngamiland East District	Maun	86,400	57,811	75,070	96,356
Ngamiland West District		22,730	36,723	49,642	61,748
Chobe District	Kasane	20,800	14,126	18,258	23,449
Ghanzi District	Ghanzi	117,910	24,719	33,170	43,370
Kgalagadi South District	Tshabong	32,800	19,794	25,938	30,016
Kgalagadi North District		72,400	11,340	16,111	20,484
Total		581,730	1,326,796	1,680,863	2,038,228

Source: Botswana Central Statistics Office: Note: 2011 Preliminary Census results.

The final sample from the 17 demographics locations presented above comprised of opinion leaders, ordinary citizens and citizens representatives in government, public and private sector as shown in Figure 3 below. The final sample covered;

- Representatives of the Village Development Committees(VDCs)
- Village Chiefs and Chief representatives
- Politicians from all parties, including councillors and un-elected politicians
- Teachers; primary and secondary schools, as well as vocational and tertiary teachers/ lecturers
- Students representatives in senior secondary, colleges and universities
- District government officers (Councils; district administration, land board and tribal administration; Police structures, health workers; Immigrations and customs; operators of reading rooms and libraries)
- Representatives of Districts Multi Sectoral Committees (DMSC)
- Representatives of Non government organizations (NGOs), Sports, churches; business community, industry, trading and others bodies).

Targeted sectorisation in the cities and towns was important to ensure that most sectors of the economy are covered to achieve a realistic representative sample. Hence, a sample of citizens' participants in the cities and towns were drawn from these sectors (a) Manufacturing and Processing, (b) Banking and Financial Services Institutions (c) Health and Medical sector, (d) Security and Armed Forces, (e) Universities, Tertiary / Vocational Institutions, Primary and Secondary Education, (f) Telecommunications Sector (g) Other commerce and service. A pictorial composition of the sample is presented below.

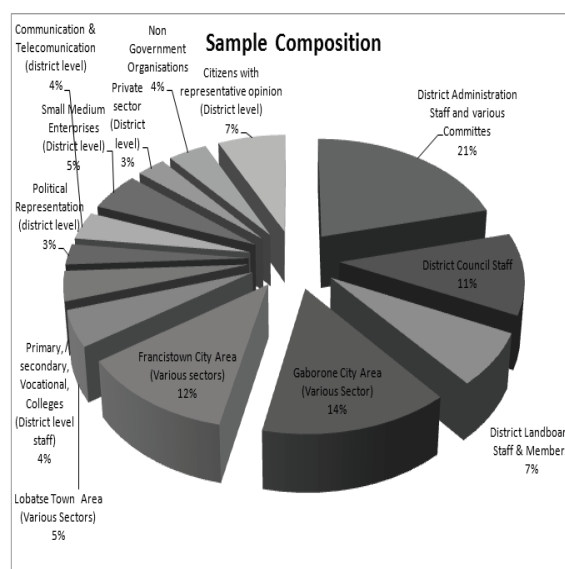


Figure 3: Sample composition (opinion leaders, district and citizens representatives)

Guided by the principle of selecting a representative sample as elaborated above, the empirically applied sampling process and methods followed in the case of Botswana enabled this paper to develop a New Population Targeted Sample Survey Model (NPTSBS-Model) presented below and discussed in the next section.

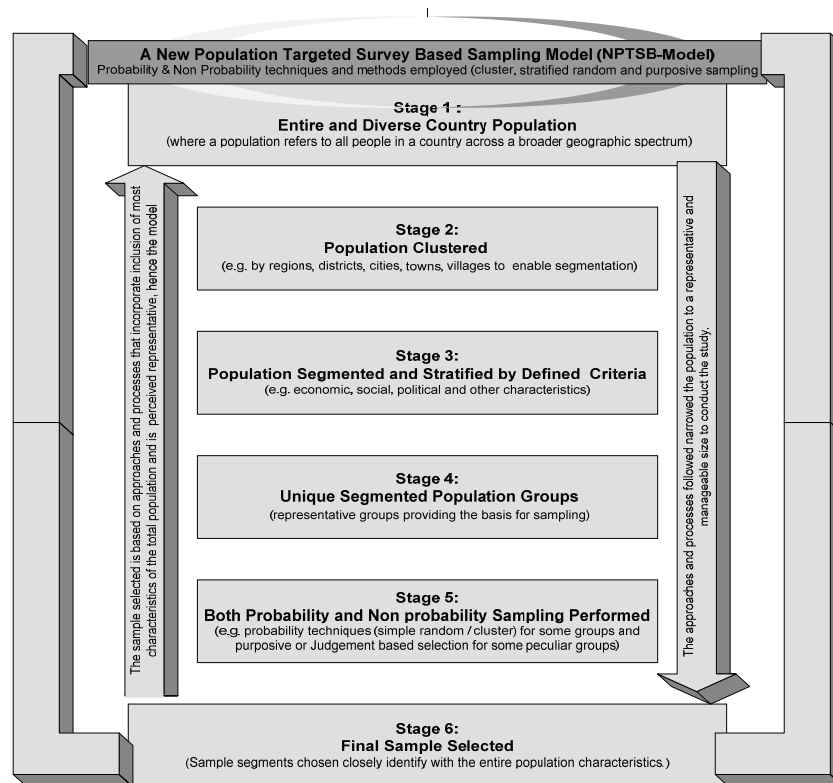


Figure 4: A new population targeted survey based sampling model (NPTSBS-Model)

8. New population targeted sample survey model

This model is a hybrid probability and non probability models that combines cluster, stratified, random (disproportionate) and purpose sampling techniques. The model goes beyond just defining probability and non probability sampling techniques, and further beyond just providing a generalised theory based emphasis on what to consider and how perform sampling, but rather offers a comprehensive framework of approaches and processes for a population based sampling and use the case study to demonstrated tangible application of the model, thereby, advancing beyond work of (Watters and Biernacki, 1989; Churchill and Iacobucci, 2002; Wilson 2006; OECD, 2008; Statistics Canada, 2003), by providing a tangible, tried and tested empirical application evidence. Fundamental to the model is a demonstrable methodological process and approach on how to select a representative sample, which is a very critical element in social research to enable reasonable generalisation of the results. In a nutshell, the model fills the gaps identified in the work of (Doherty, 1994; Bartlett II, et al, 2001; Maxwell, 2008; Barreiro and Albandoz, 2001; Mason, 2010; Sarndal and Swenson, 1992; Blaikie, 2009). The new model follows a six step process approach;

Stage 1 Understanding and gaining full knowledge of the entire and diverse country population, to observe the unique characteristics and special features to take into account when sampling.

Stage 2 narrows the population into regions or blocks and subsequently categorize into clusters and / or segments example examples are: (a) cities and towns, (b) urban villages and (c) small villages.

Stages 3 at this level the population is segmented and stratified by defined sets of characteristics. Here a wide range criterion can be employed and examples include;

- Resources (affluent, mass affluent and less affluent)
- Position influence and decision making (Including opinion leadership)
- ICTs access, awareness and usage

- Social, administrative and political structures
- Geographic dispensation, population numbers, urban and non urban areas

Stage 4, after segmenting the population as mentioned in stages 3, unique population groups are identified as a fundamental basis to selecting the final sample.

Stage 5, based on the unique groups identified in stage 4, which comprises of different composite characteristics of the entire population, both probability and non probability sampling can be used to select the final sample from strata and clusters that comprise of most population characteristics given the process followed in the Botswana case study. This will give comfort to the research findings that they realistically reflect views that would have been obtained had the entire population been probed. Here both methods can be used to compliment the short coming in the use of one. Example is where in the case study Gaborone and Francistown cities were purposively included in the sample when the random sampling did not pick them, but given their impact to the study judgement was applied to include them.

Stage 6, The final sample selected is representative of the most individual/groups characteristics within a population and consequently gives validity and reliability to a generalised results derived from the survey sample. Here, the view is that a representative sample is not best expressed by the sample size but rather the sampling process leading to actual sample selection.

9. Conclusion

Research has predominately become necessary to aid critical decisions by organisations and governments. As research design is, sampling justifications have to be part of the technical decisions at the initial stages of planning for a research project. It is necessary to ensure sampling achieves include all participants (people) in the wider population phenomenon; such could include ethnic minority groups, elderly, youth, disabled, homeless and other groups. Failure to select appropriate sample often result in poor generalisability of the research outcome which is highly dependent on targeted population groups. Consequently, where surveys are conducted and conclusions are generalised to the whole country, participants should be drawn from different areas (urban, semi-urban and rural) across the broader geographies. Therefore selection of a representative sample presented in this Botswana case study needed to fully recognise various population clusters, segments and stratum across the country, targeted for eGovernment implementation, which in this case is the whole population. It is imperative therefore that sampling decision and methods across board must ensure that the actual sample is representative of these various characteristics of population clusters, segments and groups. This can be achieved through a process that extends more than just selecting a number and/or population based percentage, whether sampling approach is quantitative or qualitative or both. Hence, the NPTSBS- Model concepts and approaches provide a practical guide in achieving population based sample representation and the model is suitable for use in variable social research cases where people based samples are selected across broader geographic locations of the entire population.

References

- Blaikie, N (2009); *Designing Social Research*, 2nd edition, *Policy Press, Cambridge* CB2 LOR, UK.
- Blaxter, L, Hughes, C, and Tight, M (2003); *How to Research*, 2nd edition, *Open University Press* Maiden head, Philadelphia
- Barreiro, P.L., and Albandoz, J.P.,(2001); *Population and Sample. Sampling Techniques, Management Mathematics for European Schools MaMaEusch (994342-CP-1-2001-1-DECOMENIUS-C21*.
- Bartlett II, J.C., Kotrlik, J.W., and Higgins, C.C., (2001); *Organisational Research: Determining Appropriate Sample Size in Survey Research Schematic. Information Technology, Learning and Performance Journal*, vol. 19, No.1.
- Bryman, A. (2008); *Social Research Methods*, 3rd Edition, *Oxford University Press Inc*, New York.
- Central Statistics Office (1991), Republic of Botswana *Population Census report*
- Central Statistics Office (2011), Republic of Botswana *Population Census Report*
- Central Statistics Office (2011), Republic of Botswana *Population Census Report*
- Churchill, G. A., and Iacobucci, D., (2002); *Marketing Research: Methodological Foundations*. 8th ed. *Orlando ; Harcourt College Publisher*
- Dumais, J., (2008); *Organisation for Economic Cooperation and Development; Higher Education Institutions: Sampling Issues OCED, AHELO GNE Paris, 2008*
- Doherty, M. (1994) *Probability versus Non-Probability Sampling in Sample Surveys, The New Zealand Statistics Review* March 1994 issue, pp 21-28.

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- Johnson, R.B and Onwuegbuzie, A.J (2004): Mixed Methods Research; A Research Paradigm Whose Time Has Come; *Educational Researcher*, 33 (7), 14- 26.
- Kallet, R.H (2004): How to Write the Methods Section of a Research Paper: *Respiratory Care*, October 2004, Vol. 49, No 10.
- Kamar, H and Ongo'ndo, M (2007) Impact of EGovernment on Management and Use of Government Information in Kenya; World Literary and Information Congress; 73rd IFLA *General Conference and Council* 19-23 August 2007, Durban, South Africa
- Marshall, M.M (1996) Sampling for Qualitative Research; *Family Practice at Oxford University Press* 1996, Vol. 13, No 6.
- Maxwell, T. A., (2008): Chapter 7: Designing a Qualitative Study; *Applied Research Deigns 07 Bickman-45636:07*.
- Mason, M (2010); Sample Size and Saturation in PhD Studies Using Qualitative Interviews; *Forum Qualitative Social Research (FQS)*, Vol. 11, No 3, Art 8 September 2010.
- Miles, M and Huberman, A (1994) *Qualitative Data Analysis* (2nd edition) Thousands Oaks, Sage.
- Onwuegbuzie, A.J and Leech, N.L (2005); The Role of Sampling in Qualitative Research, *Academic Exchange Quarterly*, Fall (2005)
- Onwuegbuzie, A.J and Leech, N.L (2006); Linking Research Questions to Mixed Methods Data Analysis Procedures; *The Qualitative Report Volume* 11, No 3 September 2006, 474- 498.
- Punch, K.F (1998); Introduction to Social Research, *Qualitative and Quantitative Approaches*, London; Sage.
- Penti. R. (2007): Analysis- Nucleus of Research project; Penti.routio@laposte.net
- Sarndal, C, E., Swensson B, and Wretman J (1992), "Model Assisted Survey Sampling", *Springer-Verlag*, New York
- Statistics Canada, (2003); Survey Methods and practices, *catalogue number 12-587-XPE*, Ottawa
- Watters, J.K, and Biernacki, P. (1989); Targeted Sampling; Options for the study of hidden populations. " *Social problems* 36, 416-430."
- Wilson, A. (2006). *Marketing research: An integrated approach*. 2nd ed. Gosport: Prentice Hall

Innovative Business Models for Smart Cities: Overview of Recent Trends

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Abstract: Several projects have been developed in Europe addressing the ‘Smartness’ of Cities. This concept is normally associated with sustainable economic development and high quality of life, being made possible by the use of advanced information and communication technologies (ICT) and Future Internet infrastructures. This paper takes on the perspective of digitalisation of public administration, to focus on the creation of a new eGovernment stage, where citizen’s experience of public service – being considered as an intrinsic quality of the latter – is enhanced by the contribution of ICT and Future Internet technologies. This in turn drives proactive mass behavioural transformation (‘Smart Citizenship’) and helps define innovative forms and channels of shared value production between governments (‘empowered’ policy makers or public sector employees), citizens (‘intelligent’ customers or service users/beneficiaries), and market players (technology vendors or developers). According to this perspective, the four key questions become: How does user experience manifest itself with a superior value across co-produced (rather than simply delivered) services? What would be a viable pricing model for these co-produced services? Who are the ‘right’ business partners to public administration and what kind of partnership arrangements would be more appropriate? And, finally Who should own and/or operate the underlying ICT (Future Internet) infrastructure? The paper offers some preliminary answers to the above questions, based on a market analysis that was recently performed in the context of a EU-funded project (PERIPHÈRIA) belonging to the CIP Smart Cities and IoT (Internet of Things) clusters. Drawn implications possibly affect well-known (and sometimes abused) terms such as sustainability, quality and impact of public service in the Future Internet era, calling for additional research on the relationship between personal/collective experience of a Smart Service and the proactive transformation of individual and group behaviours.

Keywords: eGovernment, public service, smart cities, business models, future internet

1. Introduction

Nowadays, it is increasingly being argued that Cities and City governments will be the key drivers of the next socio-economic and cultural development of the European Union (EU). From a merely legal viewpoint, Table 1 shows the extent to which government responsibilities are being held at the City level in five areas of utmost relevance for constituencies (i.e. Planning and Economic Development, Housing, Transport, Education and Training, and the Labour Market). From a demographic viewpoint, statistical evidence shows that approximately four fifths of Europe’s population now live in non-rural environments. However, the European settlement pattern and structure is quite unique, in that it includes only a few very large cities and agglomerations as seen from a global perspective. According to Eurostat’s Urban Audit data, only 18 European core cities or 56 city regions (larger urban zones) have more than one million inhabitants. At the same time, 72% of the EU27+ population (EU countries plus Norway and Switzerland) reside in cities with less than 100,000 inhabitants, named Small & Medium Sized Towns (SMESTO). Moreover, these figures are not even distributed uniformly across Member States and thus the density and character of urban and rural areas differ widely (see Figure 1).

Recently, the ‘Smart Cities’ project (2007) has provided a benchmarking of 70 European SMESTO, selected by the following characteristics: population below 500,000 (to exclude large-sized cities), at least one university (to focus on cities with a strong knowledge basis), and a catchment area of less than 1,500,000 (to ignore cities which are dominated by a bigger city). These were ranked according to their ‘Smartness’ in terms of economy, population, governance, mobility, environment and living standards. The results highlighted the importance of 31 factors, determined by 74 indicators, which are to be taken into account to improve positioning in the future. Such an approach closely resembles ISO’s (2005) IWA 4 guidelines for the application of ISO 9001:2000 in local government.

These relate ‘reliability’ of local government performance (and measurement thereof) to a number of key dimensions (actually 39) distributed in four major categories: Institutional Development for Good Government, Sustainable Economic Development, Inclusive Social Development and Sustainable Environmental Development, being part of the same self-assessment framework. Thus, both concepts of Smartness and reliability are associated with City development and ultimately better quality of life. It is understood that the use of advanced ICT infrastructures can be instrumental to reaching both aims.

Table 1: Legal competences of EU Cities in key policy domains (from ECOTEC 2007)

Thematic Area	Activity	AT	BE	BU	CY	CZ	DE	DK	EE	ES	FI	FR	GR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK
Planning and Economic Development	Developing and managing strategic regeneration plans for the City	4	3	3	1	3	3	3	3	2	4	2	2	2	2	3	2	2	3	1	3	3	2	2	4	3	2	3
	Taking planning decisions for development and granting planning permission	2	3	2	1	3	4	4	4	3	4	3	3	4	2	4	4	4	4	1	3	4	4	3	4	4	4	3
	Providing direct support for inward investors	1	1	1	1	2	2	3	1	2	2	1	0	1	0	3	0	1	2	0	3	2	2	0	2	2	1	2
	Providing direct support for small businesses / entrepreneurs	1	1	1	1	2	2	4	1	2	2	1	2	2	0	2	0	1	1	0	2	1	3	0	2	2	3	2
Labour Market	Developing and overseeing employment strategy	1	1	1	0	0	0	2	0	0	2	2	0	2	1	2	0	0	2	0	2	2	2	1	1	1	0	1
	Managing public employment service	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
	Managing active labour market schemes	1	0	1	0	0	0	2	0	2	0	2	0	2	0	2	0	0	1	0	2	2	2	1	1	1	0	1
Education and Training	Strategic management of nursery schools / childcare provision	4	3	2	0	4	4	4	4	2	4	3	4	4	0	4	3	2	4	1	3	4	2	3	4	3	1	3
	Strategic management of primary schools	4	3	2	0	4	2	4	3	2	4	2	2	3	0	3	3	3	3	1	3	4	2	3	4	3	0	3
	Strategic management of secondary schools (10/11-16)	2	2	2	0	0	0	4	3	2	4	0	2	3	0	3	3	0	3	1	3	3	0	1	4	1	0	3
	Strategic management of institutions for 16-19 education	2	2	2	0	0	2	0	3	2	3	0	2	3	1	0	3	0	3	1	3	0	0	1	3	1	0	3
	Strategic management of adult education	4	2	2	0	0	4	0	3	2	3	0	2	4	1	3	0	0	2	1	3	2	2	1	3	3	0	3
	Strategic management of Higher Education Institutions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Transport	Developing and overseeing local transport strategy	4	1	3	0	2	3	2	3	0	3	2	2	3	0	3	3	2	3	2	2	3	2	1	2	3	2	3
	Direct role in operating local public transport	4	1	3	0	4	3	2	2	2	2	2	1	3	0	4	3	1	3	3	2	2	2	2	2	3	2	2
	Direct role in procuring local public transport	3	1	3	0	4	3	2	2	2	2	2	1	3	0	4	3	1	3	3	2	2	2	2	2	3	2	3
	Planning and financing new local transport infrastructure	2	1	2	0	4	3	2	2	2	2	1	1	2	0	2	3	1	3	2	3	2	2	1	2	3	2	3
Housing	Developing and managing housing strategy	4	3	2	1	4	3	4	3	0	4	3	2	3	2	3	3	2	3	1	3	3	3	3	3	3	3	3
	Planning and financing construction of social housing	2	3	3	0	0	2	3	3	2	4	2	2	3	1	3	3	1	3	1	2	3	3	2	3	3	3	2
	Ownership of social housing	2	3	3	0	0	2	2	3	2	4	1	2	3	2	2	3	1	4	0	1	2	3	3	3	2	3	3

Legend

- 0 - no involvement
- 1 - limited responsibility / involvement (for example, a consultative role)
- 2 - partial or shared responsibility (other levels of government also have significant involvement)
- 3 - lead responsibility (other levels of government have much more limited involvement)
- 4 - sole responsibility

Source: ECOTEC, Country Profiles

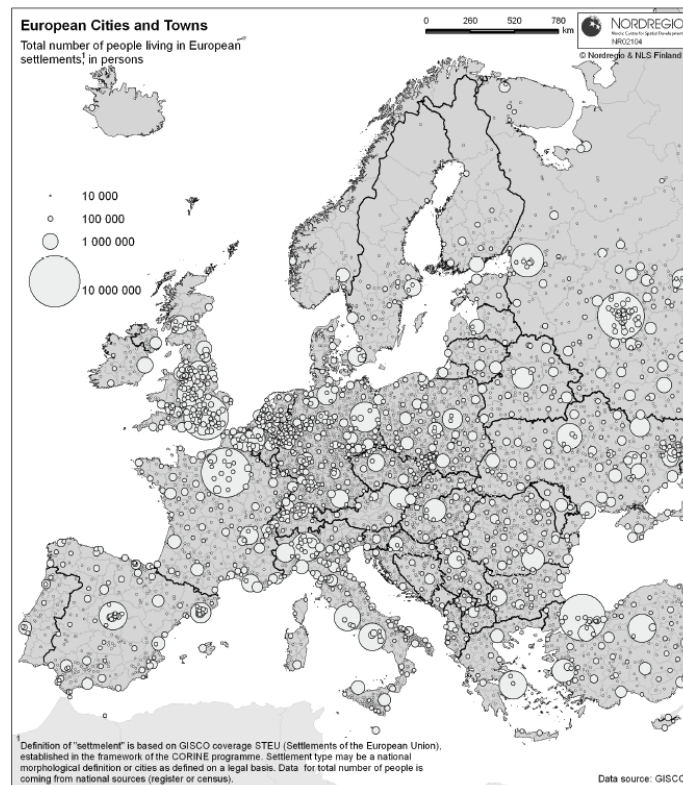


Figure 1: Spatial structure of Europe (from Damsgaard et al. 2009)

With Internet of the Future (Cave 2010) becoming pervasive and ubiquitous, SMESTO are growingly called to ensure seamless and simultaneous satisfaction of the information, communication and interaction needs of their constituencies, for both leisure and work purposes, as the following picture highlights:

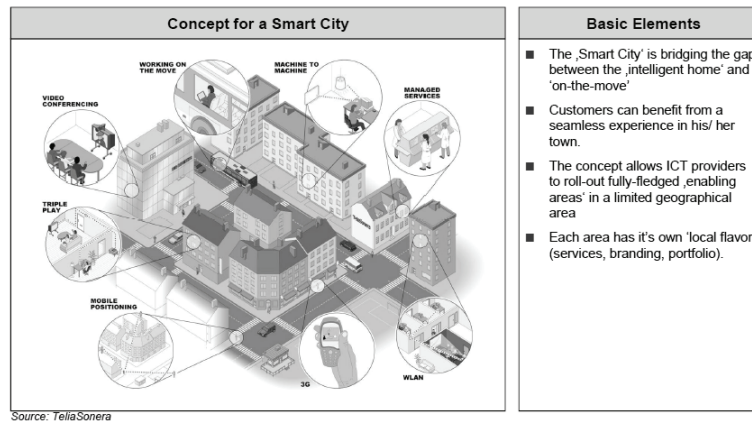


Figure 2: Ubiquitous ICT concept in a Smart City (from Figge 2009)

This paper takes the perspective of public service delivery, trying to figure out the possible impacts of the 'Smartness' concept on the pathway of digitalisation of EU local government. Undoubtedly, ICT deployment has demonstrated an enormous power over the years, in determining the configuration and evolution of public administration role, structure and presence in society. For instance, a recent (2009-2010) survey done by IPTS - one of the seven Institutes of the Commission's Joint Research Centre (<http://ipts.jrc.ec.europa.eu>) - in collaboration with EURO-CITIES, on a total of 66 European Cities across 29 countries, including all EU27 Member States, in an attempt to capture the changes in government and decision-making and the effectiveness of ICT in promoting or supporting them, has identified service delivery as the governance function that respondents recognise as being most affected by ICT (Misuraca 2011).

This effort cuts across the actual dimension of local governments. As shown by Andrea Caragliu et al. (2009), who used Urban Audit datasets to rank European Cities in terms of service digitalisation, this indicator is practically orthogonal to the level of per capita GDP. The situation does not change much if we normalise that eGovernment measure by the population or labour force (although this operation slightly modifies the relative ranking of cities in the sample). Thus, it can be concluded that *"although cities with a high level of per capita GDP also tend to devote more attention to 'smart' e-government solutions, ... some noticeable exceptions characterize ... cities in peripheral countries ... [who] have devised a wide set of forms that citizens can submit online, thus reducing travel and commuting costs, as well as the costs associated with the management of multi-task public administration bodies"*.

The PERIPHERIA project (www.peripharia.eu), funded by the European Union under the CIP (ICT-PSP) Programme in 2010-2012, points at a specific vocation for Smartness of EU peripheral cities, based on local cultural resources together with a "need to network" driven by the risk of marginalisation. The combination of these elements constitutes an ideal baseline for the development of new eGovernment services that are based on a marriage of technological and social innovation, through a discovery-driven (rather than functionalities-driven) centripetal aggregation of the three main paradigms through which Future Internet is instantiated, maximizing collective intelligence and added value for each user by informal and dynamic information sharing and knowledge creation (Boniface 2011):

- The *Internet of Things (IoT)*, showing a plethora of connected objects that may include anything from household appliances to shoes, components of a car, letters or even banknotes. The technology of ubiquitously linking everyday objects through identifying and communicating devices can not only help semantically contextualize or localize each and every one of these objects but also enable people to track, trace, monitor, trigger events, and perform actions or reactions in any possible business context, including public service delivery or co-production.
- The *Internet of Services (IoS)*, meaning a new, global, trusted, user-driven ecosystem of service providers, brokers, regulators, intermediaries and consumers who are now growingly being enabled to buy, sell, create, redesign, and assemble a wide variety of Internet-based services for a varied set of needs and desires, also resulting in new ways of organizing the interaction between stakeholders and the co-development of services between consumers/citizens and providers. Moreover, new technical solutions such as widgets and mash-ups empower users to leverage resources available via the Web on several different levels, thus seamlessly integrating user-interface content and functionality from loosely-coupled sources to create new services.

- The *Internet of People (IoP)*, now being built by the generalized use of social networks in Web 2.0 environments, emerged in the last decade to provide people with innovative communication and coordination tools that were adopted in unparalleled short time and scale. Thousands, and soon millions, of social network services (consisting of a representation of each person, often a profile, of his/her social links, and a variety of additional utilities) will allow users the sharing of ideas, activities, events and experiences within their own individual networks or communities of practice, interests and proximity.

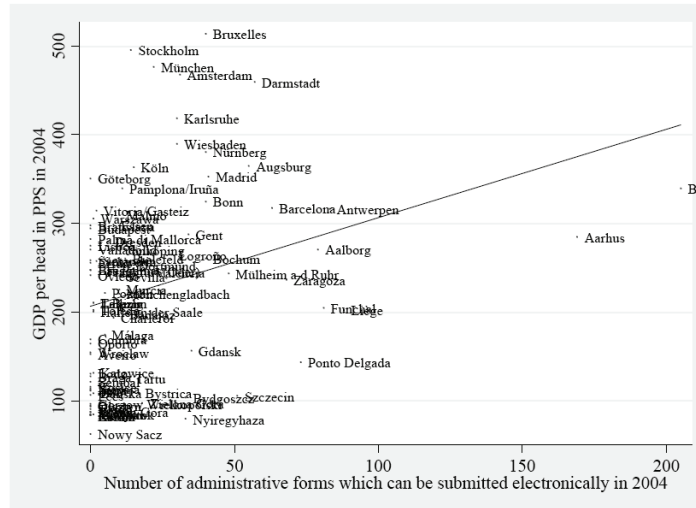


Figure 3: Lack of correlation between Government digitalisation and territorial income (from Caragliu et al. 2009)

The remainder of this paper goes on as follows: section 2 locates the Smart City concept within the broader framework of ICT-driven public service evolution; section 3 introduces a number of additional challenges that European Cities are forced to meet, which require a new generation of public services able to enhance personal experience and to ignite behavioural change as well as massive imitation, multiplication and networking effects; Section 4 discusses the implications of this scenario for future research on “the business model of (local) government”.

2. Background

As a result of rapidly changing and increasingly binding external constraints, government’s role, autonomy and strategy has evolved considerably over the last twenty to thirty years, and the support given by ICT to this modernization has also changed in parallel. After an initial focus on back-office (and later front-office) automation, digitalisation programs of EU public service have undergone four consecutive (and partly overlapping) phases of maturity, as shown in the Figure below.

As we know, the first step ahead was *Multichannel Delivery of Services* (i.e. over the counter, by mail and telephone, on the Internet, via text and television, etc.), based on the known evidence that - due to the digital divide, age and skill factors, and the biased distribution of individual preferences towards the more ‘traditional’ means of delivery - there can be no single way of fruition for any government service that satisfies the universal requirements of all prospective customers (Gagnon et al. 2010).

The second step was that of *Citizen centric electronic Government*, underlining the implication that ICT has to transform the public service to serve the needs of constituents, not vice versa; though it may be reasonably argued that very few governments to date – if any at all – have managed to implement an integrated citizen service information system successfully (Chen 2010).

The third step has been the provision of integrated/seamless/ubiquitous electronic Services to citizens and businesses, aiming to overcome the fragmentation of public agencies through *interoperability and semantic integration*: here the keywords were (and still are) ‘One Stop Shop’ portals, ‘Life Events’, ‘Cross-Border’ interoperability, ‘Service Oriented Architectures’, etc. (Deloitte 2010, ISA 2011).

The fourth step is now public *service co-production* by and with the citizens, a concept grown up in the non-ICT context (Governance International 2011) and later extended to the eGovernment domain,

leveraging ICT-enabled engagement of people – Web 2.0, ‘prosumerist’ aspects (Tapscott 1997), etc.
– to address the cost/benefit dilemma in an innovative way.

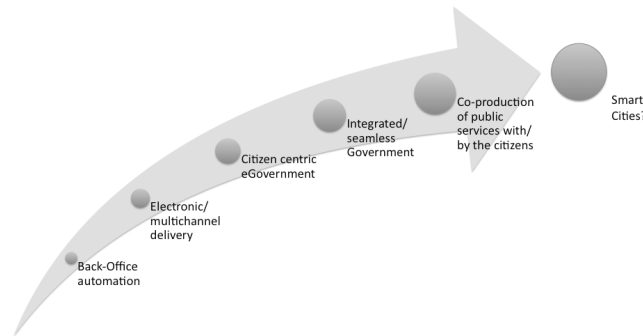


Figure 4: Pathway of digitalisation of Public Service delivery (adapted from “The PERIPHÈRIA Manifesto”, 2010)

Key aspects of this evolution – which we resist the temptation of associating to better defined time profiles or ‘capability maturity levels’ (Iribarren et al. 2008), being more interested as we are in the conceptual than the operational links between the different stages of an ideal process – are possibly fourfold:

- The gradual shift from a focus on singularity (i.e. the departmental ‘silo’, or the specific ‘service’ provided, whether electronically or not, etc.) to a focus on *multiplicity and differentiation* (i.e. the ‘constituency’, the ‘community’, the ‘market’, etc., with their own respective internal clusters and segmentations) as targets for public sector improvement, which is nevertheless still measured in terms of efficiency, efficacy, and quality of service;
- The parallel, if not linked, move towards increased customisation and personalisation of the public service(s), being delivered to the user(s) from a perspective that we might call of ‘*extended subsidiarity*’, as it is somehow generalising the implementation of Community Law’s subsidiarity principle (Toth 1992) from the administrative to the service domain, imposing the additional requirement that service providers should reside and act as close as possible to the ultimate beneficiaries – be they households, businesses, or third sector associations;
- The inevitably resulting transition from point-to-point, ex-post communication (as it happens in the management of individual complaints) to *multi-point, ex-ante communication* (e.g. for consultation or ‘concertation’ purposes) as the primary model of collaborative interaction between (particularly local) government and its stakeholders, including private and semi-private agencies that work as service intermediaries (Klieving and Jahnssen 2008);
- And the growing *technical sophistication* of the established ways of cooperation between service providers, intermediaries and beneficiaries, leading to innovative mechanisms of co-design, co-testing and co-production – pushed by the new social and technological trends emerging on the Internet, notably the “Web 2.0” revolution – which are now in focus for their potentially high impact on governmental policies and actions (Punie et al. 2009, Antiroikko 2010).

Like the figure above shows, we see the emergent Smart City movement in Europe as the ‘next step’ of this (supposedly evolutionary) process. Those Cities that are now working to create differentiated, personalised, multi-point, technologically advanced access networks and distribution systems, are the most likely to evolve into integrated Future Internet infrastructures and intelligent (‘smart’) service environments, as displayed by the next diagram.

While the above statements may look convincing, and despite the channelling of dedicated funds from the European Commission and other public entities to Smart City projects in Europe and abroad, still the level of adoption of specific solutions and the transformational impact of related ICT investments remain remarkably low. This outcome may be related to the complexity of government procurement cycles, as far as innovation is concerned, and, at least in part, to a heterogeneous level of maturity of the underlying technologies (Gartner 2011), which makes the selection process overly difficult and prone to high risk of failure, particularly in times of severe budget restriction. From our side, we prefer to raise the attention on the lack of adequate business models, enabling governments to appreciate and appropriate the creation of value (both economic and social, not to speak of other dimensions like

the environmental and the political) that derives from the successful implementation of Future Internet enabled services.

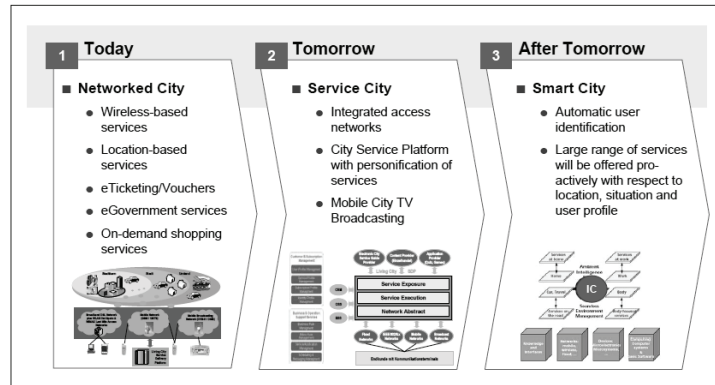


Figure 5: Smart City service maturity model (from DETECON 2009)

3. Improving the experience of public service

In fact, most challenges that City governments face nowadays – demographic, environmental, socio-economic, etc. – largely exceed the range of mere service providing infrastructures. Fast paced and enormously impacting transformations are taking place in a wide variety of domains that are relevant for community life, including: public security, climate change, water and energy, healthcare, mobility, and education. The ability here should be to turn the threats into opportunities, the weaknesses into strengths. Yet, in times of financial crisis and tight public budget constraints, this agenda is rendered overly difficult by the additional requirement for governments to “make more with less”. Although the economic crisis may result into lower public budgets, user expectations are growing fast and policies are required that fit to the very local purpose of tightening social cohesion in spite of continuing life-style changes and external strains (e.g. immigration flows). Responding effectively to such challenges requires that (local) governments:

- Deliver services which are transformational rather than merely responsive, and
- Focus more on transforming the whole relationship between the public sector and the users.

This attitude has been recently structured into the Transformational Government Framework (OASIS 2011), a set of practical, ‘how to’ guidelines and standards for the design and implementation of effective programs of technology-enabled change, at national, state or local government level. If the above challenges must be tackled in a creative way, in order to sustain the growing financial pressure on public budgets, then ‘smarter’ eGovernment services can possibly be a solution.

Moreover, this new generation of service infrastructures is so hugely expensive and/or ambitious in its goals that it cannot be successfully delivered without a proactive involvement of the beneficiaries themselves. For instance, it is widely known that even small changes in our daily behaviour (like choosing a different mix of transport means, or wasting a little less gas and electricity at home) could do a lot to prevent greenhouse gas emissions or reduce air pollution without affecting, if not by improving at all, the quality of our lives and the conditions of our health. According to World Bank estimates, only cutting water leakages by 10% in developing countries would generate money savings that equal the whole annual funding available for the purposes of international cooperation. Or if photovoltaic plants could be installed in the desert of Sahara, just a few percentage points of that capacity would be enough to satisfy the needs of the entire worldwide community. Thus, in order to successfully survive the piloting phase and move towards permanent deployment, a number of key service features should apply, among which, three seem particularly relevant:

- They should generate some degree of *permanent behavioural change* in the people involved in technology adoption, service fruition and/or co-delivery: namely, the various forms of micro-level interaction (human-to-human, human-to-thing, human-to-machine and application) implied by the take-up of Future Internet technologies must have a long lasting social impact and make people’s attitudes and lifestyles more proactive, not only during each service session, but even afterwards;
- They should activate (mass) *imitation, networking or multiplication* effects, meaning that their final outcome in terms of innovation, collective action and quality of life is more than simply the sum of individual behavioural changes, because it is self-reinforced by the initial positive achievements

and propagated to a far broader audience than the one that has contributed to shaping and launching the service;

- They must be *sustainable* – not only financially, which would also be good *per se*, but also from a societal and institutional viewpoint. Here, sustainability might also be interpreted in its original meaning, since most Smart City services, such as those related to energy, mobility and transport, are also strictly connected with the (natural and urban) environment – and sustainability thereof.

In relation to these known facts (or wishes), some governments around the world have started to ask themselves whether and how they could use or leverage the experience of public service, in order to “trigger” the required (positive, proactive) response in the “right” sample (or universe) of citizens. For instance, the UK Department of Transport commissioned (in 2009) a study on “Individual Behavioural Change” in transport and public health, and the way public policies could bring it about in the desired way(s), also taking into account the consequences of other interventions having different objectives but also unavoidable impacts. In the study, change was seen as the outcome of a dynamic process that takes place over time, at personal or family level, thus recognising the importance of habits, contexts, attitudes, unintended effects, and substantial variations between individual circumstances and responses. Recommendations for governmental action included making recourse to legislation acts (such as drinking or smoking bans in public places), pricing incentives (e.g. in relation to the consumption of alcohol, tobacco, and junk food), persuasion methods (like advertising campaigns and training sessions) and the use of ‘grassroots driven’ approaches (such as group discussions in local networks), the latter recognising the importance of social influence, peer pressure, habit, and ethical or moral influence in making policy interventions more successful as well as less intrusive.

From the above one can learn that public understanding, trust, and involvement in social programmes are helpful, and perhaps necessary, conditions for acceptability and compliance. In addition to that, a certain degree of correlation can be established between the experience of public service fruition (or delivery) and the proactive behaviour of the people (users or beneficiaries) involved in the co-creation process. As a matter of fact, there is evidence in the User Experience literature (Hassenzahl 2003), that people tend to be satisfied not only with the pragmatic attributes of a product/service, but also with other immaterial, “hedonic” values - such as emotional pleasure and social reward – that can be either intended or even unintended targets of the original design activity. Furthermore, the way people “perceive” products or services during usage and the psychological consequences activated can be very situation-dependent, as the following picture shows. For the sake of business modelling, the main interest should go to the feedback loop identified by the red, dotted arrows, namely from the contingent ‘situation’ created by the interaction of the human being with the technology, to the impact that this interaction has on the personal attitude and behaviour of the specific user under inspection.

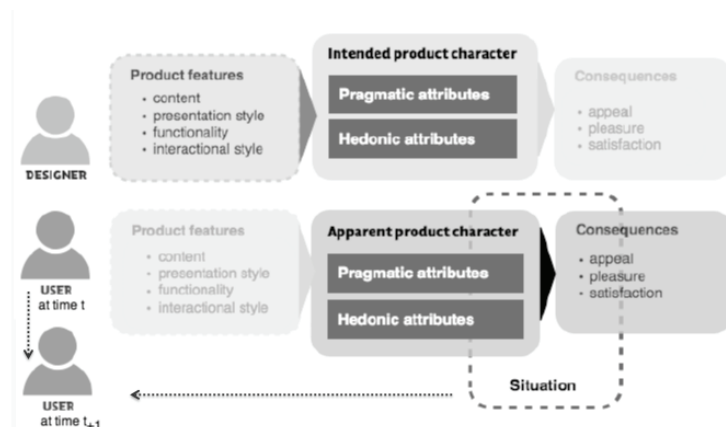


Figure 6: Hassenzahl's model of product/service experience (adapted from Peedu, 2011)

4. Implications for future business research

According to this perspective, four key questions are:

- How does user experience manifest itself with a superior value across co-produced (rather than simply delivered) services?
- What would be a viable pricing model for co-produced services?

- Who would be the business partners to public administration and what kind of partnership arrangements would be appropriate? And, finally
- Who would (should) own and/or operate the underlying ICT (Future Internet) infrastructure?

To start answering the first question, we plot in the following graph what we may call an ideal pathway to sustainability of public service. In a huge number of cases, what happens when a (traditional) new eGovernment service is deployed, is that the cumulative costs per served user largely exceed the benefits (be they financial revenues or social/environmental rewards) and this lasts for a very long period of time before the relation is reversed (if ever so). Within this scheme, the likely impact from service co-production can be said to be twofold: on the one hand, the average cost of delivery per user may become significantly lower, particularly in the early stages of development; on the other hand, socio-economic and possibly also financial benefits can derive from the massive engagement of users, and the actual behaviour changes implied by this active participation.

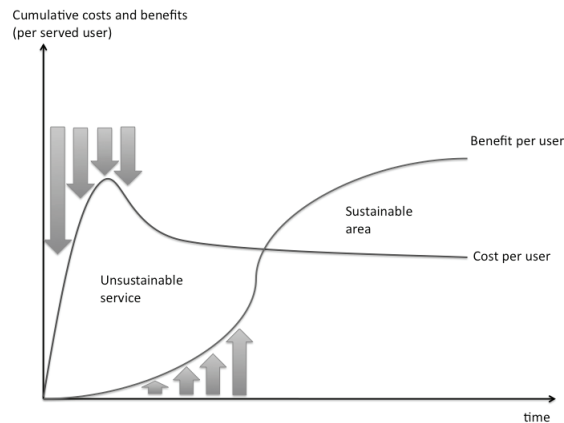


Figure 7: Value creation scheme from co-produced services and behavioural change

How to quantify and take proper account of these extra (or delta) revenues accruing to governments and society as a whole is the first big issue surrounding the Smart City business model, given the high initial cost of the eGovernment infrastructure, the difficulty of attributing a ‘fair’ price to a largely immaterial process of value creation, and the complex and largely unpredictable dynamics that are surrounding it, as explained above. In a recent (2010) market research study, AT Kearney made the point that at least in principle, four alternative options exist to realign the cost and pricing of broadband infrastructure while keeping it at the same level of openness, accessibility and performance. We believe that this discussion holds several degrees of similarity with the case of shared value generation in future eGovernment. The four options identified by AT Kearney (which may also be partly overlapping) are the following:

- Raise the average revenue per user by charging them – de facto – for services that used to be free in the past;
- Introduce a traffic-related fee to the major infrastructure users and beneficiaries (be they service or technology providers) based on the total volume or peak traffic they generate;
- Deduct a commission fee from the revenues of the service providers acting on that infrastructure, with a price premium based on delivered quality and the notion of quality of service being set by “objective” means;
- Collect commissions on the number (or value) of the technology items sold on the infrastructure, with the notion of price premium and quality of service being set this time on the basis of bilateral agreements with the respective providers.

In this new business environment, governments no longer assume the role of service providers, but shift it to “service enablers”, i.e., organizations that make it possible for other providers to reach new competitive arenas that otherwise would be inaccessible. From a governmental perspective, the vast majority of the efforts are still geared towards infrastructure deployments, but the aforesaid degrees of uncertainty are transferred to specific business actors who must be held accountable for the inherent risks and outcomes of their subsequent endeavours. The related market approach effectively breaks up the stalemate caused by the old Government’s monopoly in eServices provision, thus contributing to stimulate private sector entities in taking part to a new public-private virtuous ecosystem.

In such ecosystem, the focus of attention is turned to the provision of shared value deriving from new and innovative ICT enabled forms and channels of service co-production, grounded in interoperable complex environments that connect the end users (citizens and government officials) with technology players (e.g. software vendors and developers); empower public sector employees in the rethinking of their role towards service users; and improve citizen's experience of public service – the latter being considered as an intrinsic quality of the service itself, able to drive proactive and mass multiplication behaviour.

The envisaged revenue creation is supposed to occur by appropriately charging each target group (or at least some of them) for the coordination of interactions, negotiations and transactions occurring by means of the Smart City infrastructure. These are influenced by the fact that a member of one group (for instance, a technology provider) takes benefit from having his or her behaviour coordinated with one or more members of another group (for example, a citizen community), in light of the possible externalities that also generate indirect network effects: to put it as economists would do, the utility function of each target group is not only dependent on the quantities consumed or sold, but also on the number of individuals located on the other “side” of the market. Contextualizing the theoretical reasoning into the concrete Smart City ecosystem, end-users could get benefit from the presence of multiple service providers in competition with one another, while, reversing the angle, technology providers would not be inclined to develop Future Internet based solutions for a too limited number of installed bases, unless stimulated to enter the market through dedicated incentives, which would only compensate for the market failure, instead of putting on local government the entire burden of public service delivery.

Among the many possible strategies that can help reach a satisfactory level of implementation of the above vision, we would like to emphasize the following three:

- The “Long Tail approach”, which can be relevant for options #1 and #4 listed above. It entails the marketing strategy of selling a large number of unique items with relatively small quantities sold of each – usually in addition to selling fewer popular items in large quantities. The Long Tail was popularized by Chris Anderson in an October 2004 Wired magazine article, later elaborated in his 2006 book;
- “Pre-Commercial Public Procurement”, which can be relevant for option #3 above, in that it foresees (among other aspects) the sharing of risks and benefits between the private tenderer and the public sector organisation that uses this instrument to purchase innovative products and services in the public interest. A dedicated communication of the European Commission - COM(2007) 799 - explains in detail the functioning of this innovative instrument, by which R&D services can be procured along a phased process involving several suppliers, but that does not constitute State aid as long as the technical solutions are still in the testing phase;
- “Viral marketing”, which can be relevant for option #2 above, as through the creation of word-of-mouth or network effects one can possibly activate mass imitation and multiplication mechanisms, both on and off the Internet, sparking off a virtuous spiral of proactive behaviour and ultimately sustainable innovation.

To conclude, we argue that the value proposition of Future Internet enabled services in Smart Cities must be reconsidered in conjunction with modern public administration's mission, competences and capacities. Well-known (and sometimes abused) concepts such as sustainability, quality and impact of public service are affected by this changing business scenario, driven by the relationship between personal/collective experience of a co-produced eService and the transformation of individual/mass behaviours taking place at societal level, by virtue of interaction between and among human beings (IoP), services (IoS), and ‘things’ (IoT).

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References

- Anderson, C. (2004) The Long Tail, [online], <http://www.wired.com/wired/archive/12.10/tail.html>
Anderson, C. (2006) The Long Tail: Why the Future of Business Is Selling Less of More, Hyperion.

- Antiroikko, A. (2010) "Innovation in Democratic Governance: Benefiting from Web 2.0 Applications in the Public Sector". *International Journal of Electronic Government Research* Vol. 6, No. 2, pp 110-130.
- AT Kearney (2010) A Viable Future Model for the Internet, [online], <http://www.atkearney.com/index.php/Publications/a-viable-future-model-for-the-internet.html>
- Boniface, M. (2011) Investigating How the Future Internet Amplifies Societal Trends, [online], <http://www.seserv.org/fise-conversation/investigatinghowthefutureinternetamplifiessocietaltrends>.
- Caragliu A., Del Bo C. and Nijkamp P. (2009): "Smart cities in Europe". Research Memoranda 0048, VU University Amsterdam, Faculty of Economics, Business Administration and Econometrics.
- Cave J. (2010) "The socio-economic impacts of the Future Internet", presentation delivered at ICT 2010, [online], http://ec.europa.eu/information_society/events/cf/ict2010/item-display.cfm?id=3546
- Chatterjee K., Darnton A., Lyons G., Musselwhite C., Pilkington P., Rayner G., Tapp A., Owen E., Waygood D. and Wiltshire P. (2009) Individual behaviour change. Evidence in transport and public health, UK Department of Transport.
- Chen Y.-C. (2010) "Citizen-Centric E-Government Services: Understanding Integrated Citizen Service Information Systems". *Social Science Computer Review* Vol. 28, No. 4, pp 427-442.
- Damsgaard O., Lindqvist M., Roto J. and Sterling J. (2009) Territorial Potentials in the European Union, Nordregio.
- Deloitte (2010) Study on user expectations of a life events approach for designing e-Government services, SMART 2009/0075, promoted by Unit H2 (ICT for Government and Public Services) of the Directorate General for Information Society and Media of the European Commission, Final Report, December.
- DETECON (2009) ICT Development in New Urban Areas – Smart Cities, mimeo.
- ECOTEC (2007) State of European Cities Report, European Commission, DG Regio.
- European Commission (2007) Pre-commercial Procurement: Driving innovation to ensure sustainable high quality public services in Europe, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, COM(2007) 799 final.
- Figge S. (2009) Smart Cities, DETECON, [online], http://ikt.nrw.de/fileadmin/SITE_MASTER/content/Dokumente/Downloads/IKT-NRWArchiv/2.RoundTableSmartCities/FiggeMehrLebensqualität durch Smart Cities.pdf
- Gagnon Y.-C., Posada E., Bourgault M., Naud A. (2010) "Multichannel Delivery of Public Services: A New and Complex Management Challenge". *International Journal of Public Administration*, Vol. 33, No. 5, pp 213-222.
- Gartner (2011) Hype Cycle for Smart City Technologies and Solutions, July.
- Governance International (2011) Co-Production Model, [online], <http://www.govint.org/english/main-menu/our-services/co-production.html>
- Hassenzahl, M. (2003) "The thing and I: understanding the relationship between user and product". In M. Blythe, C. Overbeeke, A.F. Monk, and P.C. Wright (Eds.), *Funology: From Usability to Enjoyment*, Kluwer, pp 31-42.
- Iribarren M., Concha G., Valdes G., Solar M., Villarroel M.T., Gutierrez P. and Vasquez A. (2008) "Capability Maturity Framework for eGovernment: A Multi-dimensional Model and Assessing Tool". In Proceedings of the 7th international conference on Electronic Government (EGOV '08), Maria A. Wimmer, Hans J. Scholl, and Enrico Ferro (Eds.). Springer-Verlag, Berlin, Heidelberg, pp 136-147.
- ISA (Interoperability Solutions for European Public Administrations) Multimedia Assets Library (2011), [online], http://ec.europa.eu/isa/library/index_en.htm
- ISO (2005) IWA 4. Quality management systems. Guidelines for the application of ISO 9001:2000 in local government. Ref. No. IWA 4:2005(E)
- Klievink B. and Janssen M. (2008) "Improving Government service delivery with private sector intermediaries", *European Journal of ePractice* N° 5, October, [online], <http://www.epractice.eu>
- Misuraca G., Reid A. and Deakin M. (2011) Exploring emerging ICT-enabled governance models in European cities, JRC/IPTS Technical Note 65581.
- OASIS (2011) Transformational Government Framework Primer Version 1.0, Committee Note Draft 01, [online], <http://docs.oasis-open.org/tgf/TGF-Primer/v1.0/cnd01/TGF-Primer-v1.0-cnd01.docx>
- Peedu G. (2011) Enhancing Public Service User Experience in Information Society, Master Thesis, University of Tallinn.
- The PERIPHERIA Manifesto (2010), [online], <http://www.peripharia.eu>
- Punie Y., Misuraca G. and Osimo D. (Eds.) (2009) Public Services 2.0: The Impact of Social Computing on Public Services. JRC Scientific and Technical Reports. European Commission, JRC/IPTS Technical Note 54203.
- The Smart Cities project (2007), [online], <http://www.smart-cities.eu>
- Tapscott, D. (1997) *The Digital Economy: Promise and Peril In The Age of Networked Intelligence*, McGraw-Hill.
- Toth, A.G. (1992) "The Principle of Subsidiarity in the Maastricht Treaty". *Common Market Law Review* Vol. 29, pp 1079-1105.