Learning computer ethics and social responsibility with tabletop role-playing games

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PROCEEDINGS OF THE THIRTEENTH INTERNATIONAL CONFERENCE

The possibilities of ethical ICT

ETHICOMP 2013*

University of Southern Denmark, Kolding Campus, Denmark
12 to 14 June 2013

EDITED BY

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1. ETHICOMP conference series

At ETHICOMP 2011, co-founders, Professor Simon Rogerson and Professor Terry Bynum announced that ETHICOMP 2013 would be the last conference they would lead and that they would hand the conference series over to the next generation. This introduction of the ETHICOMP 2013 conference proceedings is an opportunity to discuss the ETHICOMP conference series and its importance worldwide.

1.1 Overview

ETHICOMP was conceived by Simon Rogerson and Terry Bynum in 1994. The purpose of the series is to provide an inclusive forum for discussing the ethical and social issues associated with the development and application of Information and Communication Technology (ICT). At that time virtually all activity in the field was being done in the USA. There was little interest in Europe and certainly no forum for discussion. The first conference was ETHICOMP 95 which was held in April 1995 at De Montfort University. It was a great success with scholars coming from across the world to participate. It was clear from this first conference and subsequent early ones that there was a need for such a forum and a great enthusiasm to help build something very special.

It must be remembered that ETHICOMP is a European-based conference series designed to bring together those from around the world who are interested in the ethical and social issues surrounding ICT. After the first decade it was decided that we should occasionally reach out beyond Europe and hold events in countries where no forums existed or where there had been little engagement with the ETHICOMP community. It is for this reason that ETHICOMP has been held in Japan and ETHICOMP Working conference events have been held in China and Argentina. It is why ETHICOMP has never been held in USA as there are many forums existing in the USA. In Australia, AICE was set up and still continues – it has its own conference series which is coordinated by several who participate in ETHICOMP. It would be potentially damaging of this initiative to hold ETHICOMP in Australia.

Since its inception, conferences have been held about every 18 months. There have been twelve conferences; ETHICOMP 95 (De Montfort University, Leicester, UK), ETHICOMP 96 (Universidad Pontificia de Salamanca, Madrid, Spain), ETHICOMP 98 (Erasmus University, Rotterdam, The Netherlands), ETHICOMP 99 (LUISS Guido Carli University, Rome, Italy), ETHICOMP 2001 (Technical University of Gdansk, Gdansk, Poland), ETHICOMP 2002 (Universidade Lusiada, Lisbon, Portugal), ETHICOMP 2004 (University of the Aegean, Syros, Greece), ETHICOMP 2005 (Linköping University, Linköping, Sweden), ETHICOMP 2007 (Meiji University, Tokyo, Japan), ETHICOMP 2008 (University of Pavia, Mantua, Italy), ETHICOMP 2010 (Universitat Rovira i Virgili, Tarragona, Spain) and ETHICOMP 2011 (Sheffield Hallam University). Delegates and speakers from all continents have attended. There have been three ETHICOMP working conferences in 2007 (Yunnan University, Kunming, China), in 2011 (incorporated as a workshop in CACIC-2011, Universidad Nacional de La Plata, La Plata, Argentina) and in 2012 (incorporated as a workshop in CACIC-2012, Universidad Nacional del Sur, Bahía Blanca, Argentina),

Over 1000 papers have been presented at ETHICOMP events with most of the leading researchers in computer ethics as well as new researchers and many doctoral students presenting papers. ETHICOMP is now an internationally recognised conference series. Many academics return to ETHICOMP conferences on a regular basis. With the establishment of a community, ETHICOMP is in many senses owned by that community.

1.2 Influence

The conference series has fostered much international collaboration and resulted in exciting new ideas being presented at ETHICOMP by newly formed author partnerships. Indeed the series has been instrumental in creating a truly international critical mass of scholars concerned with the ethical and social issues of ICT.

Indicative of this is the International Society for Ethics and Information Technology (INSEIT) formed in 2000 and now associated with the series. The electronic ETHICOMP Journal was launched in 2004 to further the work of the conference series and enable those in the field of computer ethics to gain access to the rich resource of papers from the ETHICOMP conference series. Papers from the conference series appeared in the occasional editions of the electronic journal. Finally, the refereed Journal of Information, Communication and Ethics in Society (JICES) conceived in 2003 and now published by Emerald since 2007 provides an outlet for published research from the ETHICOMP community and beyond. Recently JICES has been accepted onto Scopus, the world's largest abstract and citation database.

Within Europe many academics from within the ETHICOMP community are involved in collaborative research funded by national research agencies as well as the European Union's Framework programmes. Worldwide there is a similar picture of funded collaborative research for scholars within the ETHICOMP community.

1.3 Trademark

There have been a number of approaches during the early years to influence ETHICOMP by third parties – this seems to be because the community started to grow and others saw the potential. In order to protect the ETHICOMP community and what it stood for, ETHICOMP was registered as a trademark of De Montfort University. This means that DMU has to authorise usage of the name ETHICOMP and as such the Centre for Computing and Social Responsibility has in practice a safeguarding role for the community.

1.4 Principles

The conference series is founded on some core principles

- ETHICOMP is a broad based conference series which address the social and ethical perspectives of ICT and converging technologies
- It is inclusive providing a forum for those with diverse opinions to share and debate issues in a collegiate atmosphere. Dialogue is fundamental.
- It is multidisciplinary. This means that both single discipline and multidiscipline papers are presented at the conferences. The community is receptive of these differing perspectives
- It is culturally diverse. Delegates have come from all continents and presented papers from many cultural perspectives
- It is supportive of academic growth.
    - New scholars/researchers are encouraged to present papers, all of which are within the main programme rather than in a separate stream. This promotes inclusivity and collegiality.

1.5 Call for papers

In line with encouraging academic growth and widening access to this area the call for papers is based on the submission of extended abstracts of around 1000 words. Papers are reviewed and accepted on this basis. Whilst the quality of papers inevitably varies there are great advantages to this approach. First many scholars have come to the conference as they enter the field for the first time. Their ideas

are sometimes not well formulated but they are encouraged by the community. Many have submitted high quality papers at later ETHICOMP conferences which have subsequently been published in refereed journals. Secondly, scholars have the freedom to explore new avenues without worrying about the rigours of a full paper. This has led to new research perspectives and in some cases this has led to research funding to explore the new perspective. Thirdly, there is often the completely "off the wall" abstract which appears to have merit but it is difficult to pin down. These types of submission bring an extra stimulation to the programme. ETHICOMP has been instrumental in creating and sustaining an Ethics and ICT movement. The call for papers strategy adopted is a key element of this.

1.6 Programme

The programme will usually fill three days of four streams. Sessions are of two, three or four papers. Presentations are restricted to 15minutes to allow plenty of time for questions. Sessions are chaired by attending delegates who are invited in advance. Opportunity to chair sessions is given to new scholars/researchers. There are usually two keynote sessions on day one and day two. Keynotes are invited who will give a different view to the conference papers. Often local keynote speakers are chosen to raise awareness and recognise cultural/political/social diversity. The last afternoon is set aside for conference dialogue. The question time format has worked well with questions being submitted by delegates to a panel drawn from the ETHICOMP community.

There have been suggestions that research students should have their own stream. This has been rejected because it is felt including research students in the main programme provides them with greater experience and feedback within a very supportive environment. These young scholars are the future and as such must be nurtured.

1.7 The future of ETHICOMP

It is our hope that what has been achieved so far will be built upon and that the unique ETHICOMP community that exists will continue to flourish in a collegiate, supportive, collaborative, inclusive and open manner. There are many within the community who subscribe to the ETHICOMP principles, represent existing and new generations, and are multidiscipline. To those friends we hand over ETHICOMP with our warmest best wishes and look forward to its on-going success under your leadership and participation.

2. ETHICOMP 2013

The overall theme for the ETHICOMP 2013 is "The possibilities of ethical ICT". The aim is to explore, from a range of perspectives, the complex and often interrelated ethical and social issues surrounding pervasive ICT. In order to do this there are two broad themes for the conference

2.1 PROCESS

Process concerns the activities of ICT professionals when undertaking research, development and service/product delivery. The aim is for professionals to be virtuous in Aristotelian terms. In other words a professional knows that an action is the right thing to do in the circumstances and does it for the right motive. For example, cutting profit so that more development time can be spent on making systems more accessible to those with limited ability, such as dexterity, is a virtuous action if it helps to overcome social exclusion. Four typical areas that can be explored under this theme are:

- Education and Training: e.g. e-learning; learning for life; digital tutors; robot learning; the nature and content of ethically sensitive ICT education and training
- Design: e.g. value driven; participative
- Governance: e.g. internet; closed networks; clouds

- Conduct: e.g. professionals, users

Education and training has two perspectives. Firstly, together these provide the tools and understanding for professionals to willingly undertake acceptable practice. Secondly, the nature of the process of education and training is crucial in that it sets the benchmark for those aspiring to enter the world of ICT. Design and governance addresses the process of developing ICT in the former and the process of ensuring acceptable policy is operation systems in the latter. Finally conduct explicitly defines and examines the processes those involved in ICT adopt.

2.2 PRODUCT

Product concerns the outcome of professional ICT endeavor and the potential impact of these products on people, society and the environment. Four typical areas that can be explored under this theme are:

- Application Areas and Impacts: e.g. social space; work place; environmental impacts and safeguards; health
- Emerging Technologies: e.g. robotics; nano technology; welfare technology, artificial companions
- Embedded ethical values
- Technological Integrity

The ethics focus of the product perspective is technological integrity from, for example, a Kantian or utilitarian perspective. This can be addressed by embedding ethics within ICT products themselves. This might be as simple as building in "opt-in" facilities in service provision via the Internet whereby a person must ask to be informed of future service offerings rather than having to request explicitly not to receive such information by default. They might be more complex, for example, whereby a non-human agent in telecare is programmed with defined ethical principles so that it will only instigate actions which are deemed to be societally acceptable. It is the growing application areas of ICT and the emerging technologies which present increasingly complex ethical issues that need to be effectively addressed so that ICT product are acceptable

2.3 The conference

These proceedings contain the papers presented at the conference. Papers are published in alphabetical order of the first author's surname. Together the papers represent a body of new work from over 130 authors from 18 countries around the world. It is an important contribution to our understanding of ethical ICT.

ETHICOMP is not just about the written papers. It is about dialogue, collegiality and friendship. The conference directors and programme committee thank you in your roles as authors, session chairs and delegates for making ETHICOMP 2013 a reality. We hope you will enjoy the conference and will be inspired to continue to contribute to this vital area. With ETHICOMP entering a new era there is a great opportunity for you all to shape the future of ethical ICT in both process and product.

KEYNOTE ADDRESSES

ANDROID ETHICS

Henrik Scharfe

The advent of more full-fledged androids in society, calls for a thorough reconsideration of robo-ethics, as well as IT-ethics in general. The main challenge in this regard is how expectations towards and performance by super realistic humanoid robots may converge in a future where understanding and reasoning is totally conditioned by our relationship with machines.

Henrik Scharfe is Professor of Information Science and Director of Center for Computer-mediated Epistemology at Aalborg University in Denmark. His research challenges the boundary between man and machine in the field of Human Centered Robotics – a combination of HRI and bio-mimetics. He often talks about the Android Reality, the societal condition he envisions where humans and androids live and work side by side. He is also known as a TED speaker and 2012 TIME100 honoree.

THE DEATH OF BIG BROTHER - SURVEILLANCE AS AN ACCOMPLISHMENT

Peter Lauritsen

Peter Lauritsen has in many years worked on Science & Technology Studies (STS), ethnographic research and humanistic health research. He is the co-founder and current director of the Centre for STS Studies and co-author of the first Danish introduction to STS. In recent years, he has conducted research on surveillance, and in 2011 he published the book Big Brother 2.0. Peter Lauritsen is currently directing the project, 'Surveillance in Denmark' which is the first research project in Denmark to investigate the implications of the enhanced use of surveillance technologies.

FROM ETHICS OF THE EYE TO ETHICS OF THE HAND: OUTLINE OF A PARADIGM CHANGE FROM HERMENEUTICS TO PHENOMENOLOGY IN THE DISCOURSE OF ETHICS AND ICT

Ellen Christiansen

Ellen Christiansen has since 1985 studied design and implementation of digital technologies in professional work settings from a learning perspective, most prominently in Police investigation. labour inspection. In recent years her empirical research has concentrated on sustainable design and end user innovation in the home. She is currently head of eLearningLab, http://www.ell.aau.dk/, at Dept. of Communication and Psychology at Aalborg University, where she is Professor in Participatory Design.

THE CHALLENGES OF DIGITAL EDUCATION IN THE INFORMATION AGE

A. A. Adams

Abstract
Digital technology has already created significant change in Higher Education (HE) over the last thirty years. The changes in the technological infrastructure are still increasing their pace, however, and the organisational structures of HE institutions may struggle to cope with the changing demands of students, employers, governments and their own staff. Alterations in the very minds of their students now growing up in a ubiquitously computational and networked world, the demise of the possibility of the closed book examination (and anyway its increasing irrelevance to the needs of both the individual as persona and as worker) and the rise of MOOCs (and other OPen Educational Resources) pose significant challenges to a sector which has grown enormously in the space of just one or two generations and which is still struggling in many ways to cope with a shift to mass rather than elite higher educational practises.

Keywords
Higher Education, Digital Education, MOOCs

1. Introduction: The State of Higher Education (HE)

Digital technology has created significant disruption in many areas of life. Like previous technological changes, it has undermined or even destroyed certain things while opening up new possibilities for work, leisure, education and love. Content producers and distributors in text, graphic and audio-visual fields have been subjected to significant disruption of their ways of working and their revenue streams. Until recently, Higher Education (HE) has so far seen only the foothills of this disruption, with a gradual evolution towards electronic provision of learning materials, an exploration of enhanced learner-learner communications and learner-educator communications, development of interactive computer-aided learning materials, and computer-aided production of academic assessment work which is then graded by an educator. The scale and pace of disruption appears to be approaching the threshold of the ability of the higher education system to absorb these disruptions in a calm evolutionary manner, however, with some particular areas of concern emerging: the validity of qualifications based upon assessment methods which can no longer be relied upon to be the actual student's own activity; the cost of in-person tuition for a mass HE system outstripping the financial benefits available for a significant proportion of the graduates combined with a tendency to place more of the burden of payment onto the graduate instead of being funded by general taxation; the emergence of massively open online courses provided by institutions with the best reputations potentially undermining the raison d'être of schools with lower reputations.

Within the space of two generations HE has, in the developed world, shifted from being the privilege of the elite to a mass system, although in most countries still a minority pursuit (just under half in the US and the UK, for example, but over half in Canada, Japan and Korea − source: OECD (2012), all tertiary education which includes further education as well as HE). In contrast, the developing world has generally seen very limited expansion. This expansion has often, though not always or everywhere, included a shift of the burden of funding from the state to the individual, and has also seen a rise in for-profit HE institutions.

OECD (2012) reported that between 2000 and 2009, spending in the vast majority (18 of 25) of OECD countries on higher education shifted from society to the individual. Williams (2012) provides clear evidence that in the US state of California this shift was primarily a result of the 2007 financial crisis and the resulting drop in state support for higher education. The UK's coalition government has justified its shift of the burden of the costs of HE (according to OECD (2012) now one of the highest in the group at 70% individual) by appealing to the need for public spending austerity, although this

argument has been challenged by many on the grounds that no actual savings on current expenditure by the government will be seen for more than five years (if ever, since any reductions in public expenditure actually depend on the level of repayment of the new loans which are in turn dependent on average graduate salaries).

The emergence of affordable individual computer technology in the 80s and the growth of computer networking in the 90s Presented significant challenges to universities in both financial resources and staff capabilities, as well as providing a new set of subjects and topics for teaching and research.. As McCluskey & Winter (2012) report, the emergence of data analysis tools also applied to universities themselves and in some places this has been put to excellent use to identify students at risk of dropping out and provide them with extra support or encouragement (including warnings about lack of engagement leading to failure) and to identify good and poor pedagogical practices, hopefully replacing the latter with the former over time. In other institutions and at other times, however, this data analysis has been used by a growing managerial class to undermine academic freedom (individually and across the board in teaching and in research). The emergence of broadband Internet as a core communication technology (and the more recent development of mobile broadband Internet and the highly mobile mini-computers disingenuously called smart-phones) may well be the straws that break the camel's back in forcing a revolution on universities already struggling to evolve with the implications of prior changes in technology and society.

First, the relationships between learning, training, education, qualification and employment are presented. As universities in the developed world have seen enrolments massively increase (usually, though not always for every institution as well as across each country's sector) and in turn the roles their graduates will undertake have diversified (including many which did not exist a generation ago) universities have been pressured to become more focussed on graduate job skills and employability than on pure intellectual enquiry.

Next, the evolution of the role of educators and librarians is examined to consider their change from providers of scarce information to guides to finding and using the right information from amongst the abundance available.

Third, the question of assessment and qualifications is considered, and in particular the difficulties presented by external pressures on qualification versus the educational utility of assessment and the validity of assessments for qualification in an age where isolated examination is impossible, technology for cheating appears ascendant over technology for detection and the extrinsic benefits of qualification appear to students to outweigh the intrinsic benefits of gaining a real education.

Finally, the structure of higher education and its relationship to social justice, employment and personal fulfilment is considered, alongside the possibilities for existing and new approaches and institutions to co-exist and for both to thrive. The likelihood of a significant number of institutional collapses (already seen in Korea and beginning to appear in Japan) and the consequences of allowing such failures to emerge instead of being managed are also presented.

This paper focusses entirely on the issue of Higher Education. The research and other activities of HE institutions, sometimes equally effected by digital technology (for example the debate about open access to the scholarly and scientific literature) are not addressed.

2. The Multiple Facets of the Idea of a University

Universities are seen by many different stakeholders in education as having a wide variety of purposes and ideal mechanisms. Governments may see universities as threats to the social order (many revolutions in the twentieth century have featured or even been started by students) but may also see them as mechanisms to directly hold down youth unemployment figures while improving the employability of their graduates and therefore as indirect wealth generators. Government also typically expect universities to engage with the broader economy in multiple ways, from creating spin-off companies and licensing inventions to training the next generation of knowledge workers (including the vast majority of civil servants, medics, nurses, engineers, social workers, lawyers etc.). Students may see university as simply the next stage in their schooling, as the expected standard

pathway where for some groups a university education is seen as an expectation rather than simply an option.

McCluskey & Winter (2012) give a highly US-centric treatment of many of the themes of this article. Their conception of the digital university draws many lessons from their experience of both non-profit and for-profit HE in the US, and is at times quite insightful about some of the challenges of, for example, digital data about student outcomes from courses and how they are used (or ignored) in various types of institution and by various stakeholders (students, academics, politicians, parents of students, alumni, employers, civil servants). However, their conception of curriculum design is rooted in US liberal arts, and is so far removed from UK practices of deep single-subject degree courses as to be of little use as a map for evolution of their approaches. They also dismiss the issue of increasing plagiarism, contract cheating and assessed work-sharing amongst students

The concept of a higher education as an end in itself and as a preparation for gainful employment (and whether such employment should make direct or only indirect use of the specific skills of a degree course) have exercised academics and politicians since at least the 1850s (Newman, 1852). These days many employers regard a degree as simply a shibboleth to ensure certain general character traits (Attwood, 2010). Others such as providers of medical care, however, rely strongly upon the training of their recruits as proof of their basic competence in areas with potentially life-and-death consequences for failure.

3. Educators and Librarians: From Information Scarcity to Information Abundance

In regards to their role in teaching, universities by the mid-twentieth century acted as both keepers of knowledge and conduits to access it. This knowledge was held primarily in two forms: the written records kept in libraries and the expertise kept in the heads of its staff (both academics and librarians). Access to the libraries was and is sometimes partly or mostly open to members of the public, primarily in person but also through the inter-library loan (ILL) scheme (Chudnov, 2001) where holdings in other libraries may be accessed via a local one (usually for a fee and including one or both of a loan of a physical object or a no-return-expected photocopy). Access to both local and remote (ILL) holdings varied depending on the policy of the library: some material, particularly physically fragile materials, could only be accessed by a select few even within the University. At the other end of the scale some university libraries would offer limited borrowing rights to local citizens, and in-person use of some resources by anyone (unless they had previously been personally banned). In addition to the materials, the knowledge of librarians about what material they had (partly itself held as accessible meta-data first in the form of card catalogues and then electronically in databases and partly as the skills of librarians) represented another significant resource. From 1967, university (and other) libraries around the world began cooperating in making their digital catalogues jointly interoperable through the WorldCat run by the non-profit Open Computer Library Centre, Incorporated (WorldCat, n.d.). Access to the expertise of library staff is often restricted to, or prioritised for, members of the university (staff and students). Academic staff expertise lies partly in knowing where to find specific knowledge, a shared expertise with library staff. In addition, academic staff also have (or are supposed to have) other forms of skills in applying knowledge and have the ability to impart those skills to students. The form of that knowledge varies radically between disciplines, though Bloom *et al.* (1956) presented a taxonomy of academic skill types which provides a useful categorisation, including concepts such as application (applying a method to a well-stated problem), synthesis (creating a new method from combinations of others) and evaluation (judging the appropriateness of a method for solving a problem or a solution to a problem emerging from the application of a method). Students attending a university became (very junior) members of that university and in doing so gained an opportunity to use the resources made available to them, including the library, the expertise of the librarians and the proffered teaching of the academic staff. This teaching includes a variety of elements, with variation depending on the subject as well as on the approach of the university but includes:

- lectures: primarily one-to-many delivery of information in audio form with some visual assistance;
- educator-created explanatory material (primarily text and visual material);
- educator-selected explanatory material;
- meta-data pointing to recommended sources for specific information;
- seminars: interaction audio exchange of information between lecturers and students often including formal peer learning between students, i.e. one-to-many and many-to-many interactive learning with guidance from the educator;
- exercises in applying the skills of the course;
- grading of student-completed exercises;
- feedback on student-completed exercises.

Howard-Jones (2009) and Small *et al.* (2009) , among many others present compelling evidence that in both teenagers and older adults (and almost certainly all other ages as well) there are significant general brain changes associated with significant use of the Internet. Cull (2011), among other issues, summarises recent research on the impact of online sources of information on the reading habits of "researchers" (everyone from undergraduates to professors seeking information from written sources). This research points to developing habits in all ages and levels of research-reader to skim material rather than read in depth and to follow "horizontal" searching techniques (looking for breadth of coverage) instead of "vertical" (reading a sequence of articles in depth to follow the development of an idea through argument, counter-argument and supporting material). There are regular complaints by academics in the columns of the self-reflective magazines1 for HE such as the Times Higher Education Magazine and the Chronicle of Higher Education that modern students are unwilling or even unable to approach reading lists of the size and complexity of yesteryear (Brabazon, 2011), that they will reference a Wikipedia article rather than the primary research that Wikipedia itself claims as it's justificatory sources (Grove, 2012), see Wikipedia's own self-reflective articles):

- Notability: en.wikipedia.org/wiki/Wikipedia:Notability
- Verifiability: en.wikipedia.org/wiki/Wikipedia:Verifiability
- No Original Research: en.wikipedia.org/wiki/Wikipedia:No_original_research
- What Wikipedia is Not: en.wikipedia.org/wiki/Wikipedia:What_Wikipedia_is_not

and similar complaints about the information-seeking and interpretation habits of modern students. Not all academics are equally dismissive of these new approaches, as Grove (2011) reported, with some academics seeking to embrace Wikipedia as a useful academic resource (but seeking to put it in a suitably academic context for the students).

The pace of change introduced by the shift from 1990 where few subjects other than computer science and high energy physics had electronic versions of scholarly articles at all, to 2013 where there is so much information that the dominant skill is seeing the trees amongst the wood rather than seeing the wood made up from the trees. This is less than one generation and today's academic workforce is primarily still made up of those for whom their primary information tasks as students themselves, and in their academic training beyond, were about deep digestion of the smaller number of relevant pieces available. Their students are more used to an abundance of information and their strategies are primarily about keeping the time spent internalising the information to a minimum and building an internal index link to where to find it.

It is becoming increasingly unclear as to whether the ingrained practices of traditional HE noted above can still fit the needs of modern learners as learners or fit them for the workplace they will find upon graduation (if they even graduate). On the other hand, the new models of online HE (including massive open online courses [MOOCs], for-profit online colleges and distance education courses in developing countries (Liyanagunawardena, 2012)) are emerging very quickly, but evaluation of their quality and validity for learners seeking education and qualification, for employers seeking filters for

recruitment, for governments seeking qualification for licensed occupations, is difficult because of their newness and the still fast pace of change within them.

4. Education, Qualification and Assessment

As previously presented (Adams, 2011) the new technologies of mobile, networked and (soon) wearable computing are challenging many of the assumptions about how educational progress can be assessed. The Internet, just as it allows a seller of an obscure item to find a buyer perhaps half the world away, or sharers of obscure interests to find enough others to form a vibrant network, puts unscrupulous students together with unscrupulous brokers and providers of bespoke coursework completion services. Everything from essays to computer programs and even entire Masters dissertations are offered for bespoke cheating, though as with many areas of a grey economy the claimed and actual quality of such purchased material may or may not match up to its claims (Baty, 2005). Such issues gave weight to those critical of coursework heavy assessments who claimed that unseen exams were the gold standard and should be used as the primary, perhaps only, standard assessment format. However, mobile networked computers have already shown that such exams can no longer be assumed to be taking place in an isolated situation (Yomiuri Shimbun, 2011). Given the changes in neural development that the abundance of information and the ubiquity of networked information technology are creating, it is also becoming doubtful whether such artificial test conditions are actually relevant to the purposes of the assessment anyway. No serious programmer develops computer code by trying to write it out longhand on paper. Instead they make full use of integrated development environments with help files, syntax checkers, library browsers and many other tools to help them, including access to their own prior work and sample code from others. Software engineering indeed teaches about the benefits of code re-use as a core element of its curriculum. Working lawyers and legal researchers do not rely on their brains to remember all the details of statute law or precedential decision. Instead, they used to rely on printed texts and indexes, but now rely heavily on database searches in free (legal information institutes) or subscription (such as LexisNexis) systems. Employers also constantly stress that in general they are more interested in team players than lone wolves as recruits, so requiring students to sit exams in isolation from their peers also seems unrelated to their likely workplace.

On the other hand the benefits of qualifying for a degree are substantial in terms of access to careers which are either or both financially and intellectually rewarding. It is the individual financial rewards in particular that have underpinned the justification from HE institutions raising tuition fees in the US and from governments shifting the cost of tuition from society onto students in Australia and the UK.

In a world where it is practically impossible to distinguish the work of a skilled fraudster from a dedicated student, particularly in the middle-rank, in assessments, it was suggested in (Adams, 2011) that universities must focus instead back on offering an education, in which the purpose of formative assessments remains as it always has been (focussed on developing the skills of students by practising the skills of the discipline) while summative assessments are used to inform students and educators of students' suitability to progress to the next stage, not in a sense of a barrier to progression but in the sense that without the underlying skills of pre-requisites further advanced education is generally inaccessible to the student. However, digital technology has recently thrown a further curveball into this mix in the shape of MOOCs.

Since MIT announced their OpenCourseWare (OCW) project in 2001 (Goldberg, 2001), there has been significant attention paid to questions of Open Educational Resources where educators and experts (and sometimes crackpots and incompetents) make learning material available online for free, usually under a permissive copyright license (frequently some version of Creative Commons). In 2007, the University of Manitoba announced that from 2008 it would be offering a course designed to be taken online by large numbers of students. Registration and engagement in the course would be free, although it would not carry academic credits and assessment of any assigned work would be carried out only where feasible to be done automatically by computer or voluntarily by fellow students. Since that announcement, the concept of MOOCs has somewhat exploded and to some extent eclipsed the OCW approach. Unlike OCW material, MOOCs are typically offered without copy

and reuse rights – students signing up for the course have no more rights to the material than students ever do to the learning materials they are provided in a normal educational setting: they may make use of them for their own learning but not pass them to others, nor reuse them as the platform for becoming educators themselves.

Something of a bandwagon emerged in 2011 with the launch of MOOCs by institutions such as Stanford University. In 2012 two competing platforms and organisational bodies to support MOOCs were launched in the US: Coursera based at Stanford and EdX (originally called MITx but renamed when Harvard joined as co-sponsor). Coursera is a for-profit organisation and EdX a non-profit. The UK's Open University, which had already entered the OCW field with OpenLearn in 2006, launched a UK-based MOOCs platform and organisation (as a wholly-owned for-profit subsidiary of the non-profit Open University) in 2013. One UK universities had already signed up to run MOOCs on Coursera, and both Coursera and EdX have other European and Asian partners, although as of writing FutureLearn included only UK partners.

So far, MOOCs have been successful in attracting students to register, but have struggled in getting students to complete the course. They have also struggled to identify clear business models for funding their ongoing operations, though some are moving towards fees for credit-bearing registration such as the University of Texas system (Matthews, 2012). The Open University's Vice-Chancellor Martin Bean described MOOCs in 2012 as a potential "Napster moment" for higher education (Corbyn, 2012). In combination with the doubts raised by ubiquitous networked communications and mobile computing/communications devices detailed above, this prediction seems persuasive. Despite prophecies of doom due to Napster and its successor sharing sites, the recorded music business has not collapsed (in fact such predictions have been rife for decades, such as the "Home Taping is Killing Music" campaign of the 70s) although their profits have been cut and some major music recording companies have been through tough times. It is likely that HE would see similar results to a Napster moment. Cosy expectations that the future will be very much like the past may be rudely shown false. In the resulting disruption, it is likely that both positive and negative consequences for society will emerge.

5. Higher Education, Privilege and Social Justice

Is education a privilege or a right? The Universal Declaration of Human Rights has it as a right and suggest that it should be free (i.e. zero cost, although only requiring that it be free at the elementary level the suggestion is that it should be funded by society not the individual leaner).

Article 26.

(1) Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit.

Once one has achieved a certain level of education, however, this is sometimes regarded as creating privilege, even amongst those of otherwise oppressed groups (in Europe and the US: female, race other than white, homosexual or bisexual, etc.). This is not an uncontroversial view. What is close to undeniable is that a higher education is more easily and freely available to those with other privileged states in their society (males, white people, able bodied people, heterosexuals) and that this is one of the reasons for continued dominance and perpetuation of privilege by and for those groups. What changes might the disruptions to HE systems detailed above make in this privileged and privileging system?

Rising university tuition fees in the US (in all sectors – public, private non-profit and private for-profit) and the shift to loan-based systems in the UK and Australia are claimed to reduce the possibility of university education for those from the lowest socio-economic groups. However, HEPI in the UK found no significant evidence of a drop in the number of young people from such backgrounds when the fees payable by students jumped from around £3.5k to £9k between 2011 and 2012 (Thompson and Bekhradnia, 2012), nor did it find an impact on course choice or university

location choice (i.e. whether to attend only a local university and continue living with parents or move to a university further away). This perhaps reflects a success of the UK government's work in stressing the income-contingency repayment nature of the UK student tuition loan system, where repayments are only due beyond an income threshold higher than the parental income of the students concerned. Although recent changes in funding regime in the UK have had no apparent negative impact on the HE opportunities of those from lower socio-economic backgrounds, there remains a significant divide in both participation at all, and in the prestige of the institution attended, likelihood of completion of course, depending on socio-economic class measures (see the website of the Higher Education Statistics Agency [HESA]: www.hesa.ac.uk for detailed figures). In the US, there are similar concerns, particularly over the rising costs to students of full first degrees at both state and private HE institutions.

The fees and the privileges that attendance at high prestige institutions brings may or may not survive the Napster moment of MOOCs

6. Conclusions

If cheating on educational assessments becomes rife, as seems possible, then HE institutions face problems at both ends of their system. If they cannot rely on exam results at the end of school (A-levels in the UK, SATs in the US, entrance examinations in Japan) then institutions which seek to admit students with high ability will find it difficult, or perhaps impossible, to distinguish the students they are seeking. In addition, such cheating will also most probably undermine the confidence of employers in valuing the educational assessments of universities, removing the financial benefit of having the degree qualification. Employers will instead be forced to find other ways of recruiting staff with the skills they need, evaluating them on-the-job. Even employers may find it difficult to ensure that their employees actually have the skills they claim, as demonstrated by the recent story of a Verizon worker who had successfully outsourced his own computer programming job to China for several years, and been regularly evaluated as one of their top coders (Kim, 2013). He was only caught due to irregular Internet access usage being noted by the firm's security staff (having given direct access to the company's VPN to his contractors).

At the same time as their qualification processes are being undermined, universities are faced with competition for their educational services from free online offerings of MOOCs, using peer learning as a core replacement for teacher/learner interaction within a course designed by an academic at a high brand university. If businesses come to accept the undertaking of such courses as sufficient to warrant access through the initial recruitment filters, then mid-level universities and perhaps local community colleges may well suffer from sufficient loss of enrolment to undermine their institutional existence. The benefits of in-person contact with the academics, and other factors such as endowment funding which in some cases negates the necessity of charging fees to students at all and can in many other cases reduce fees sufficiently to allow institutional continuity, are likely to see the high prestige universities survive and continue to offer their expertise via MOOCs. The economies of scale they thus achieve might even allow them to charge sufficiently modest fees for enrolment and even some form of limited “qualification” that their place is assured. Other institutions may not fare so well and with no deep pocket of endowments, no the prestige to tap governments for subsidies and no prestige to attract large numbers of students to their MOOCs, from whom a percentage might pay for the rest, they may be facing a bleak future.

HE is in for some interesting times over the next two decades as networked communication infrastructures expand via Moore's Law and overtake the information guardianship of academics in teaching and librarianship.

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A FRAMEWORK FOR ELECTRONIC BUSINESS ETHICS: A COMPARISON STUDY BETWEEN THE UK AND EGYPT

Gomaa Agag and Ibrahim Elbeltagi

Abstract

The rapid spread of e-commerce has created tremendous opportunities for economic efficiency and customer choice. Use of the global Internet computer network for e-commerce activities provides some advantages to the consumers on their daily life. On the other hand Internet represents a new environment for unethical behaviour. This study investigates the effect of online retailing ethics on customer satisfaction through marketing strategy and transaction cost theory. As well as examining the difference regarding the e-retailing ethics framework among a B2B and B2C in the UK and Egypt. Also, the moderating role of confidence benefits and buying frequency between e-retailing ethics and customer satisfaction. The research model was developed based on the literature review. The results**:** Ethical problems like security, privacy, reliability, non-deception and corporate social responsibility on Internet are core issues that limit the growth of online retailing. Implications for theory and management have been discussed.

Keywords

Business ethics, online retailing ethics, confidence benefits, buying frequency, customer satisfaction, Relationship marketing strategy and transaction cost theory.

1. Introduction

The internet has come as a strong alternative way of physical retailing. The overall users of the internet worldwide reached 7 billion in 2012, up from 420 million in 2000 and 1 billion in 2005 (Internet world stats, 2012). The World Wide Web (WWW) users have been multiplying so rapidly and have widely spread into all walks of life. The use of the Internet is no longer limited to those computer nerds who do it for fun or curiosity. It has opened up tremendous business opportunities for its users. "Electronic Commerce", the term first used by (Kalakota and Whinston, 1996), has become the most important trend for doing business in the 21st century. Two prominent examples are the American Commercial Alliance in Silicon Valley and the Federal Government's use of Internet for purchasing. In Japan, hundreds of million U.S. dollars have been invested in setting up networks for promoting electronic commerce.

During the previous two decades, while the overall users of the internet have increased with great speed (Internet world stats, 2012), many traditional retailers of some industries have introduced business processes based on the internet (Pavlou and Gefen, 2004).

Internet creates a" new environment for unethical behaviour "(Freestone and Mitchell, 2004. p.126), and avoiding the ethical rules demolishes the relationships based between organizations and customers (Fisher et al., 1999:157). If the companies that use web sites in order to perform electronic commerce do not restrict to some of the ethical standards, they will produce bad results like a bad reputation and a lack of trust that might cause losing the whole business (Schneider, 2006:328). Ethical attitudes make the customer satisfied and helps make an organization successful (Fisher et al., 1999:157). So, various strategic marketing decisions should have the ethical factor, while unethical companies begin to lose their customers rapidly. In this study, we take a first step into the analysis of the influence of online retailing ethics on customer satisfaction from the view point of internal and external ethics, as well as the moderating role of confidence benefits and buying frequency on customer satisfaction. This study focuses on online shopping sites. The study will not deal with other Internet sites -such as online newspapers, portals, free down-load sites, customer-to-customer sites such as eBay or job sites- that exist for purposes other than online shopping and that are advertiser supported.

This paper is organized as follows: Section 2 discusses theoretical background of Business ethics, online retailing ethics, confidence benefits, buying frequency, customer satisfaction, relationship marketing strategy and transaction cost theory. Section 3 presents the proposed research model. Section 4, the methodology of the study is described. Finally, the conclusion and the contribution of the study

2. Literature review

2.1 Business ethics

Business ethics', defined in most simple terms, is the application of ethical principles to business. (Gaski, 1999), stated that the moral philosophy of Aristotle refers to the meaning of "ethics" as: "human behaviours according to the viewpoint of their rightness and wrongness". (Pires and Santon, 2002), Ethics referred to the goodness of acts "ethics is considered as all possible moral principles or values which might guide behaviour (Sherwin, 1983). Subjects such as medical ethics, and even legal ethics, are conceptually simpler to grasp, because they deal with particular, well-defined professions. "Business" is a rather more ambiguous word. One might wonder what it is in particular that ethics is being applied to.

The academic subject of business ethics could be said to focus on a number of levels. At its broadest level, it is concerned with the justification of economic systems. Questions about the ethics of capitalism might be raised, for example, or the consideration of whether profit can ever arise from behaviour defined as ethical. At the next level it is concerned with the structures and norms within a specific system, for example the laws and regulations which guide the activity of different parts of the system. Further attention is given to the main feature of these systems — namely, corporations, focusing on their structures, activities and responsibilities. Finally, there has been much discussion of the moral responsibilities and rights of individuals within those corporations. As corporations have expanded their operations overseas, especially into less developed countries, a large part of the business ethics literature has focused on issues arising from this. Commonly discussed issues relate to different cultures and moral values and the need for and possibility of universal codes of conduct.

We can conclude that business ethics is two things; first, ethics refers to well-based standards of right and wrong that prescribe what humans ought to do, usually in terms of rights, obligations, benefits to society, fairness, or specific virtues. Secondly, ethics refers to the study and development of one's ethical standards.

2.2 Online retailing ethics

The online retail market is growing rapidly, especially in the UK, and now covers a large assortment of products and services. Throughout this period e-retailers have had to ensure they offer consumers appropriate customer service and a pleasant online shopping experience, including the order fulfillment process. Wholesale and retail trade contributed 11.3% of total Gross Value Added in the UK economy in 2011. The retail industry, however, is subject to a number of pressures. These include changes in shopping habits and the decline of consumer confidence. In 2011, 2.9 million people were employed in the retail sector, accounting for 10.3% of employment. 1.1 million People were employed in the wholesale sector, accounting for 4.0% of all employment (Department for Communities and Local Government, 2012).

On the other hand, Egypt is the largest market in the Arab world. A population of more than 84 million citizens makes Egypt a lucrative market in the Middle East. About 42% of the population is under the age of twenty (Cairo Festival City hopes to capitalize on Egyptian retail sector, 2008). Cairo, Egypt's capital has about 17 million residents. Alexandria, the second largest city, has over 4 million people. *Egypt Retail Report* forecasts the country's retail sales to grow from EGP147.80bn (US$27.22bn) in 2010 to EGP208.37bn (US$38.37bn) by 2014 (Egypt Retail Report Q4 2010).According to the Al-Futtaim Group, there will be an increase in per capita income by 7.2%) between 2007-2014. This will lead to an increase in demand for luxury products and necessitates more modern retail technology. This shift will attract the attention of international brands for the Egyptian retailing market. Egypt's GDP was US $226 Billion in 2010. Between 2010 and 2014, GDP per capita, is predicted to rise by 63.9% to U.S. $4,463.

The ethics of online retail practices is an understudied phenomenon in general (Palmer, 2005; Sama and Shoaf, 2002), yet consumers' concerns regarding ethical issues surrounding online shopping continue to rise (Kimery and McCord, 2006). As previously discussed, the topic of online retailing is still an under-researched area. In what follows, we summarize the results of the empirical studies that specifically address ethical issues related to marketing on the Internet (please see table 1). Table1 summarises prior studies on ethical issues and shows subject areas, purposes, factors, and results, the ethical issues in electronic commerce especially online retailing has not yet been fully examined. This study on B2B and B2C ethics can be used to understand the ethical issues which can confront the customer and retailers as well as its effect on customer satisfaction as well. Based on the prior studies this study will focus on some ethical issues in E-commerce such as (Privacy, Security, Non-deception, Fulfilment/reliability, Social responsibility). Roman, (2007) pointed out that there is a positive relationship between e-retailers ethics (Privacy, Security, Non-deception, and reliability) and customer satisfaction. And Yoo and Donthu (2001) found that consumers' perceptions of online security played an important Role in their satisfaction. Further evidence from Wolfinbarger and Gilly (2003) revealed that fulfilment/reliability was positively related to consumer satisfaction. While researchers have considered the impact of CSR by innumerable number of factors, including word of mouth, customer loyalty, their attitudes, their intentions, customer's emotional attachment, shopping in-store, and brand identification, very few studies have considered the relationship between customer satisfaction and CSR. Luo and Bhattacharya (2006) investigated Fortune 500 companies, concluded a direct link between CSR and customer satisfaction. Their study concludes that customer satisfaction is mediated by the relationship between CSR and firm market value. That is, the incorporation of the customer satisfaction construct diminished to non-significance as the effect of CSR on market value. (Fisher et al., 1999:157). Found that ethical attitudes also create customer satisfaction and it is a key factor that helps organizations to have long-term success. According to Lagace et al. (1991), a salesperson should not disclose false information to influence a customer. Once the customer learns the truth, their trust and satisfaction will be lost. On the contrary, if the salesperson provides correct information, then the customer will feel more satisfied with the service and the trust and satisfaction will be followed by word-of-mouth recommendations. Therefore, it is clear that the positive ethical sales behaviour will decrease the transaction costs that result from false information and thus have a positive effect on customer satisfaction.

Table 1 Ethical issues related E-commerce ethics.

Study	Area	Purpose	Factors	Results
Culanan (1993)	E-commerce	To examine ethical issues of consumer privacy on the Internet	Data sharing, trespassing loss of anonymity, direct marketing, unintended use of data	Data sharing, trespassing, loss of anonymity, direct marketing, unintended use of data. Privacy
Caudill and Murphy (2000)	E-commerce	To examine both historical and conceptual analyses of privacy	Privacy, security, trust	Privacy, security and trust. Growth of E-Commerce
Bart et al., (2001)	E-commerce	To develop a conceptual model that links web site and consumers characteristics, online trust, and behavioural intent.	Privacy, security, fulfilment	Privacy, security, and fulfilment. Consumer trust towards the website
Gauzenet and Ranchhod (2001)	E-commerce	To develop a model of ethical interactivity with consumers.	Notice, Choice, Contact, Security, Access	Notice, choice, contact, security, and access. Ethical interactivity

Study	Area	Purpose	Factors	Results
Fraanzak et al., (2001)	E-commerce	To explore issues surrounding the protection of consumer privacy	Privacy, Cookies	Cookies. Privacy
Maury and Kleiner (2002)	Online retailing	To investigate ethical issues in electronic commerce.	Privacy, Intellectual property	privacy, and intellectual property. Growth of E-commerce
Menestret et al (2002)	E-commerce	To present a case and its development up to the decision of yahoo.	privacy	E-ethics.Media crisis
Sama and Shoaf (2002)	E-commerce	To examine the advent of the web as a critical media tool in the promotion and sale goods and services to consumers.	Privacy	Privacy. Consumer welfare
Beltramini (2003)	E-commerce	To provide a brief overview of the application of the "FTC" lesser known unfairness doctrine as a potential frame work for better understanding emerging privacy and e-commerce issues.	Privacy, Trust	Unfairness doctrine. Protecting consumer privacy
Beltramini (2003)	E-commerce	To investigate the relative importance of three types of web site attributes : privacy, security, and trust	Privacy, Security, Trust	Privacy, security, and trust. Willingness to give private information.
Mukherjee.and Nath.(2003)	Online retailing	To develop a model of trust in online relationship banking.	Shared value, Communication, Opportunistic behaviour, Trust, Commitment	Shared value, communication, and opportunistic behaviour. Trust. Commitment
Siplor et al (2004)	E-commerce	To examine ethical issues of consumer privacy on the internet.	Loss of anonymity, Data sharing, Direct marketing, Unintended use of data	Loss of anonymity, data sharing, direct marketing, and unintended use of data. Privacy
Palmer (2005)	E-commerce	To examine some practices associated with marketing on the internet.	Pop-ups, Cookies, Spam	Pop-ups, cookies, and spam. Privacy. E-commerce

Study	Area	Purpose	Factors	Results
Pollach (2005)	E-commerce	To examine privacy policies from a linguistic angle to determine whether the language of these documents is adequate communicating data-handling practices in a manner that enables informed consent on the part of the user.	Privacy, Trustworthiness	Privacy and trustworthiness. Privacy policies. Mitigate unethical data handling practices.
Roman (2007)	Online retailing	To develop a reliable and valid scale to measure consumer's perceptions regarding online retailing ethics.	Privacy, Security, Non-deception, Fulfilment/reliability	Privacy, security, non-deception, and reliability. Customer satisfaction and trust
Roman and Cuestas (2008)	Online retailing	To examine the consumer's perceptions regarding online retailing ethics.	Privacy, Security, Non-deception, Reliability	Consumer Internet expertise. Privacy, security, non-deception, and reliability. Customer word of mouth
Limbu., et al (2011)	Online retailing	To examine the effects of consumer's perceptions concerning the ethics of online retailers on web site satisfaction and loyalty.	Privacy, Security, Non-deception, Reliability	Privacy, security, non-deception, and reliability. Customer loyalty
Nardal and Shin (2011)	Online retailing	To measure the perceptions of consumers regarding the online retailing ethics.	Privacy, Security, Non-deception, Reliability	Privacy, security, non-deception, and reliability. Customer satisfaction
Senthikumar., et al (2011)	Electronic banking	To explore the perception of the customer on corporate social responsibility in banking service.	Corporate social responsibility	CSR. Customer satisfaction
Shahazi. et al (2011)	E-commerce	To examine the factors influencing consumer's perceptions of online shopping.	Privacy, Reliability	Privacy and reliability. Shopping online
Yam B and Limbu (2012)	Online retailing	To examine the effects of consumers' perception of online retailers' ethical behaviour on consumer purchase and revisit intentions.	Perceived Ethics, Trust	Perceived ethics. Consumerisms' trust and attitudes. Purchase and revisit intentions

From the literature in table 1 it is clear that no study in online shopping ethics has applied the transaction cost theory. Consequently, the understanding of transaction cost theory application to online shopping ethics is not comprehensive. We take a first step into the application of transaction cost theory in online retailing ethics. Second, existing online shopping ethics studies combine privacy

and security concepts into one dimension (Parasuraman et al., 2005; Wolfinbarger and Gilly, 2003; Yang et al., 2004). For example, Wolfinbarger and Gilly (2003, p. 193), who developed the etailQ scale, argue that one of its four dimensions, security/privacy, is' 'security of credit card payments and privacy of shared information. In this study we distinguish between privacy and security. Third there is no study examined the effect of external ethics (corporate social responsibility) on customer satisfaction through the perceived confidence benefits. In this study we take a first step into examining the effect of corporate social responsibility on customer satisfaction to enhance our understanding for this area.

In short, prior research has identified privacy and security as the most important ethical concerns of Internet consumers. This study will focus on privacy, security, reliability, non-deception, and social responsibility. The ethics of online retailers is a multidimensional construct composed of five dimensions: security, privacy, non-deception, reliability and corporate social responsibility. Security refers to consumers' perceptions about the security of the online transaction (i.e., the safety of the payment methods) along with the protection of financial information from unauthorized access. Privacy, on the other hand, refers to consumers' perceptions about the protection of individually identifiable information on the Internet. Fulfilment/reliability is related to the accurate display and description of a product so that what consumers receive is what they thought they ordered, as well as the delivery of the right product within the frame promised., non-deception refers to the extent to which the consumer believes that the online retailer does not use deceptive or manipulative practices with the intent to persuade consumers to purchase the website's offerings. This dimension focuses on consumer's perceptions of online retailer's deceiving/misleading practices, rather than on the act of deceiving itself. Finally, social responsibility is a liability or ethical responsibility towards society as well- the socio-economic view.

2.3 Customer-perceived confidence benefits

Gwinner et al. (1998) developed three types of relational benefits, including confidence benefits, social benefits, and special treatment benefits. Among these, confidence benefits are the most critical factor in the service encounter. Some researchers have pointed out that confidence benefits, stemming from the trust in the service provider or the confidence in the provider's reliability and integrity, describe the risk reduction in the process of transactions (Morgan and Hunt 1994). In addition, consumers prefer choice reduction (Sheth and Parvatiyar, 1995); and confidence benefits may be earned by facilitating decision-making and simplifying the choice-making process (Gwinner et al., 1998).

This study is mainly from the customer perspective, based on the theory of transaction cost, to investigate the confidence benefits which customers perceive from the elimination of opportunistic behaviour and reduction of the anxiety caused by uncertainty, and the effects of these benefits on the customer relationship. According to Gwinner et al. (1998), confidence benefits are feasible for high-contact, customized, and personal service sectors. In this study we examine the role of perceived confidence benefits as a mediator between online retailing ethics and customer satisfaction. According to the study of Gwinner et al. (1998) on relational benefits, customers will feel satisfied and develop loyalty if they perceive benefits from the service encounter

2.4 Buying frequency

The frequency dimension has received limited attention in the TCA literature. Prior researchers have been largely unsuccessful in confirming the positive association between transaction frequency and hierarchical governance structure or transaction costs (Rindfleisch & Heide 1997). For instance, Pilling et al. (1994) has found frequency is unrelated to transaction costs. Some researchers have considered frequency as a dichotomous phenomenon (one-time versus recurring transactions) and thereby control for frequency by examining only recurring exchanges (John & Weitz 1988; Klein, Frazier & Roth 1990; Rindfleisch & Heide 1997).

Noordewier et al. (1990) defines frequency as the frequency of order issued by the buyer in its study of industrial supplier and buyer relationship. In a similar study, Pilling et al. (1994) defines frequency as the volume of transactions processed.

In this study, the buying frequency refers to how often the consumers turn to the online channel for purchase. Recurrent transactions enable consumers to gain knowledge and experience which have the effect of mitigating the perceived transaction costs. Previous study by Teo and Yu (2005) has found a negative relationship between buying frequency and perceived transaction cost. If consumers have high online buying frequency, they are likely to continue adopting the online channel for purchase, reason being their knowledge and experience gained may have the effect of reducing the perceived transaction costs. In this study we examine the role of buying frequency as a mediator between online retailing ethics and customer satisfaction.

2.5 Customer satisfaction

Customer satisfaction refers to the consumers' post-purchase comparison between pre-purchase expectation and performance received (Oliver, 1980). In this research, consumer satisfaction is defined as the satisfaction of consumers with the web sites of online retailers.

We expect that the online retailing ethics will have a positive influence on consumer satisfaction. From a theoretical perspective, drawing on the expectancy disconfirmation paradigm (e.g., Oliver and DeSarbo, 1988), consumers make a comparison between product expectations and performance that will result in either confirmation or disconfirmation. Customers' expectations are confirmed when product performance exactly meet expectations. Positive disconfirmation occurs when product performance exceeds prior expectations, and negative disconfirmation occurs when expectations exceed performance. Confirmation and positive disconfirmation will be likely to result in satisfaction. Customer expectations regarding the product are highly dependent on the information displayed at the site (Coupey, 2001).The higher the ethics of the website, the more likely that it provides realistic expectations about the product. This may result in confirmation or even positive disconfirmation between expectations and product performance, thus resulting in customer satisfaction with the website.

2.6 Cost transaction theory

The basic concept of transaction cost theory was posed in Ronald Coase.s classic paper, "Nature of the Firm" (1937). He considered that the governance structure of both firm and open market are opposing alternatives, and that which alternative is chosen depends on the transaction cost. Transaction cost analysis is used to find the optimal governance structure. Williamson (1981) extended Coase.s study and pointed out that the assumption of transaction cost is based on the bounded rationality and opportunism. Bounded rationality implies that any individual in an organization has limited competence to solve complex problems and process information; hence, the uncertainty exerted from bounded rationality resulting in incomplete purchasing process and will increase costs (e.g information searching and monitoring).Opportunism implies that the other party will probably lie, steal, cheat, and play tricks for its self-interest; thus the related costs for such opportunistic behaviour will increase the transaction costs related to the information searching, wasted time, monitoring and the opportunity cost.

Uncertainty arises from the difficulty in predicting the actions of the other party in the transaction due to opportunism, bounded rationality, and asymmetry of information Williamson, O.E. (1981) and Williamson, O.E. (1985) A high level of uncertainty is likely to increase transaction cost because both parties in the transaction spend more time and effort in searching for products and vendor related information as well as in monitoring the transaction process.

Ganesan (1994) pointed out that hazards of opportunistic behaviour will occur, when a buyer-seller relationship cannot be easily terminated with an incomplete contract. But, if trust exists between the two parties, opportunistic behaviour would be eliminated. In other words, trust will reduce opportunistic behaviours and lower the risk due to opportunistic behaviour. Thus, the related

transaction cost will be reduced in the exchange relationship, and when the confidence benefits are perceived, the possibility of long-term relationship will be raised. From the customer's perspective of confidence benefits, the costs related to information searching, negotiating, and monitoring will decrease while customer has confidence in the e-retailing ethical sales behaviour. Once customers perceive the confidences benefits from cost reduction, the positive effects on satisfaction would occur. Therefore, transaction cost theory could be used to explain the relationship in which e-retailing ethics is an antecedent of confidence benefits perceived by customers, and where customer satisfaction is its outcome variable.

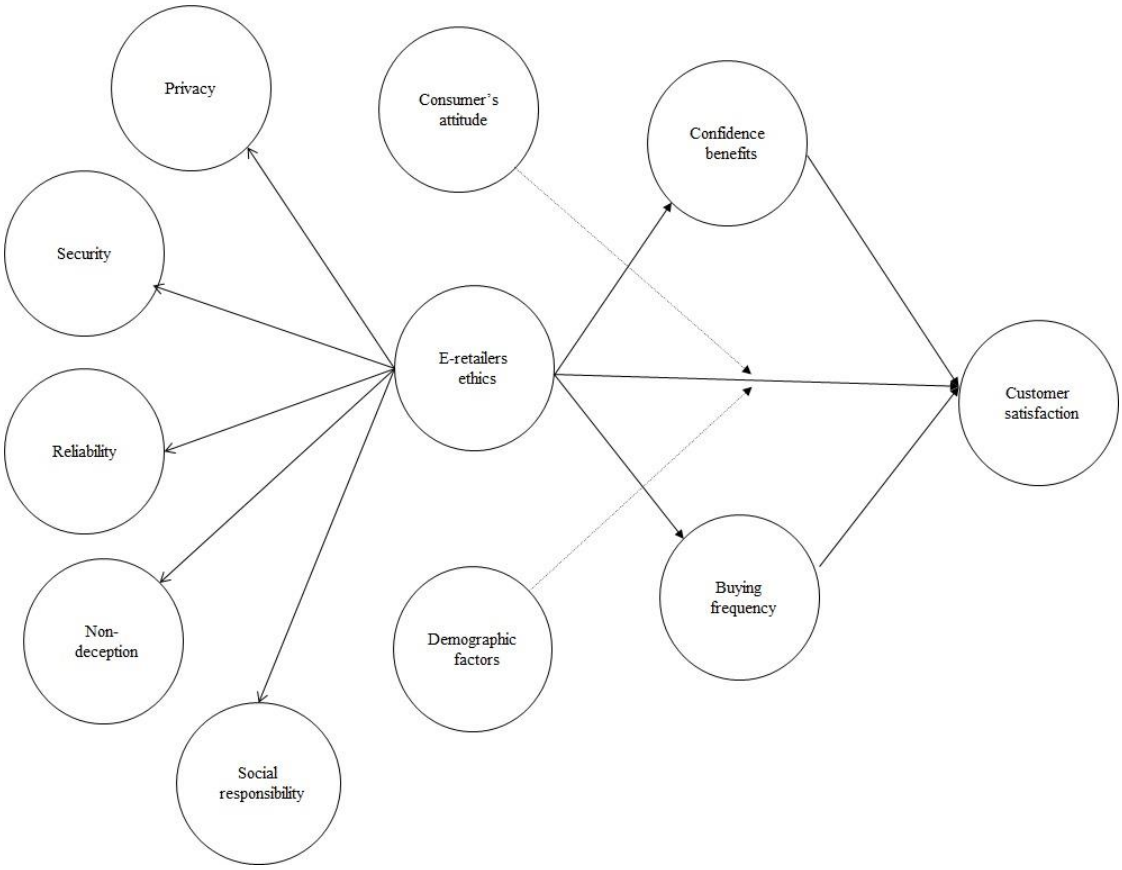

Figure 1. Research model

3. Research model

The online retailing ethics is still an under-researched area, and consequently, there are some models. In what follows, we review the general marketing/business ethics models developed in the literature. Then we summarize the results of the empirical studies that specifically address ethical issues related to marketing on the Internet. Finally, we focus on specifying this model as integrated model which enables the e-retailing stores to deal with these ethical issues related to marketing on the Internet. In this model we will indicate the effect of e-retailers ethics (privacy, security, non-deception, reliability and social responsibility) on customer satisfaction by the customer confidence benefits and customer perceived value as a mediator as in Figure 1.

4. Research methodology

This study is based on an intensive examination for the literature review to develop the research framework. The researches as well used observation for both B2B and B2C business to in order to develop and build a conceptual framework for ethics in e-business organisations.

5. Conclusion

This study investigates the effect of online retailing ethics on customer satisfaction, and the role of customer confidence benefits as a mediator. Based on the literature review most of prior studies focused on privacy and security and neglected others issues such as (reliability, non-deception, and social responsibility, as well as there is no empirical study has been found that examined the corporate social responsibility as an ethical issue in the context of the online retailing ethics (see table 1). Therefore we advise the online retailers to behave ethical with their customers and take into their account the social responsibility as an ethical issue, as well as to attempt to increase the impression of trustworthiness. This could increase consumer satisfaction.

6. Contributions

This study contributes to the field of online retailing ethics differently. Firstly, the current study presents an initial attempt to apply the transaction cost economy framework to the online retailing. Although a number of studies have applied TCE to explain the rise of e-commerce and cost savings in e-commerce (Malone *et al*, 1987; Morton, 2006), very few studies (Liang and Huang, 1998; Teo and Yu, 2005) have investigated empirically the consumer's acceptance of online shopping from a TCE perspective. No empirical study has been found that examined this issue in the context of the online retailing ethics. This study demonstrates that customers' satisfaction of online retailing can be measured using a TCE approach. Finally, we take a first step into the analysis of the influence of e-retailing ethics from the view point of organizational and environmental ethics on customer satisfaction and the role of customer's attitudes as a moderator between the e-retailing ethics and customer satisfaction.

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ELEARING EVOLUTION: NEW CONCEPTS ON ICT & LEARNING

Mario Arias-Oliva and Juan Carlos Yáñez-Luna

Abstract
In this paper we describe a new emerging concept of e-Learning. The new definition was supported mainly on academic literature, searching a cross fertility among theoretical approaches. We focus our research on state of the art in eLearning arena. Keystone variables of eLearning were identified in theoretical frameworks, with a revision of trends on teaching methods using technology "anywhere", "anytime" and "any-device". We reached a new broader eLearning definition that includes many other dimensions, overcoming focus just on ICT.

1. Introduction

The use of Information and Communication Technologies (ICT) in educational systems has many approaches: organizations are acquiring technology as complementary tools for teaching and learning processes, and at the same time learning process is questioned. The wide area that eLearning covers, makes very difficult to find an accepted research framework.

Nowadays e-Learning models focus mainly on technologies. Coetzee and Eksteen (2011) show us that ICT advance has transformed the way to teach and learn in academic environments. The use of ICT has revolutionized space and time on the learning schema. Badawy (2012) assume that eLearning is the transfer of skills and knowledge using ICT tools. Jethro, Grace, and Thomas (2012) and Chan and Ngai (2012) defines eLearning as a system that is used to develop learning experiences. However, Hermes Lück (2009) points out that virtual environments are a huge interrelationship network.

Nowadays ICT is a critical dimension of learning at any level: school, higher education, professional training, life-long learning, etc. Individuals and institutions are adopting technology as a compulsory tool to teach and learn. Because of this reason, it is important to have a solid framework about what eLearning is. Distance learning, virtual learning, classroom learning… Could all these terms be considered as eLearning? We must integrate ICT, learning models and theories to explain emerging hybrids learning models as Blended learning (b-Learning) (Camacho, Chiappe Laverde & López de Mesa 2012) or Mobile Learning (m-Learning) Zhang & Li (2012). E-Learning has been also involved on technological innovation, and the problem that we find is that there are many definitions and concepts about what eLearning is. Those definitions and concepts should be integrated in an emerging eLearning framework.

This work is structured as follow: In section 2 we will review the eLearning literature to know the state of the art. In section 3 we will describe the methodology used for this work and we will resume the outcomes of the research. In section 4 we will describe our eLearning model. In section 5 we will show our research conclusions.

2. E-Learning. Literature review

There are many approaches to define eLearning. Literacy is one of them. According with García Carrasco (2009) literacy may be defined as an extension of communication process adding sign, oral language and writing contexts. In this sense, López-Barajas Zayas (2009) points out that the digital literacy is considered as a significant process in which technological knowledge is reached in order to improve the quality of processes and outcomes in any service or product. Laschewski (2011) points out that digital literacy includes both the aptitudes to use ICT tools and the media literacy abilities to work with multimedia and Internet tools.

Web 2.0 and mobile bring another approach. Collaborative and constructivism schemas certainly are an important development on Internet. The previous context determines the technological perspective on Internet, according to Fernández Gómez (2009); Prendes Espinoza & Cabrero Almenara (2007), the use of these platforms allow developing collaborative situations by using the tools or applications that incorporate, such as Chat, Wiki's, WebQuest, Blogs or emails; tools developed exclusively for this type of education such as networked virtual campus, Learning Management System, Learning Content Management System and Virtual Environments for Teaching and Learning, Groupware, Computer Supported Collaborative Learning (CSCL), Computer Supported Cooperative Work (CSCW) and 3D Virtual Worlds.

In this case there are two types of collaborative learning according to conditions and procedures. These classifications come from organizational theories applied to educational institutions, and can be defined as formal and informal:

- **Formal:** In this case, the collaboration is a planned and time-based process for learning.
- **Informal:** In this schema, the construction of learning is based in learner´s own experience across the life.

In both cases (formal and informal) ICT have important impacts and benefits.

Rising ICT acceptance in learning process in opening new ways to deliver and create knowledge. We observe that hybrids models as bLearning and mLearning are used to describe the evolution of eLearning. According to Camacho, Chiappe Laverde & López de Mesa (2012) blended learning is a model in which learning and teaching processes are combined face to face and ICT-based methodologies. According to Zhang & Li (2012) mLearning is the acquisition of knowledge using mobile devices in anywhere and anytime. The concept of 'Internet of things' Coetzee & Eksteen (2011); Cheung, Yuen & Tsang (2011) refers to the incorporation of each mobile device to the Internet. Cheung et al. (2011) visualize the mobile learning as a flexible learning environment in which learners are enabling to learn in anywhere, anytime and with any technological device.

Naismith et al. (2004) propose an approach based on learning theories in the context of mobility: Behaviourist, Constructivist, Situated, Collaborative, Informal & Lifelong, and learning and Teaching Support. We will focus on approaches with more impact on eLearning. In the situational context Vavoula et al. (2009) evaluated the efficacy of using mobile devices in the learning process in a specific scenario and with particular activities. The study showed that the service was effective in enabling learners to gather information and to build personal reflections in the classroom. Pfeiffer et al. (2009) identify whether mobile devices were adequate to support the acquisition of knowledge. The study concludes that using ICTs in learning process has an additional benefit of learning in combination with the real-world experience.

On the blended context, Warschauer (2007) lead a study using laptops which determines that the use of these tools encourages a broad development in information searching skills and strengthening student research activities. Williams & Pence (2011) conducted a study in the classroom using mobile devices such Smartphones, described them as devices with high capacity and very easy to carry. Smartphones are changing habits of students.

In the collaborative context Alvarez, Brown & Nussbaum (2011) worked in a study on postgraduate and undergraduate courses using Netbooks and Tablet PCs. The study emphasized the interest of the students on the use of Tablets and Netbooks and focus on behavioural effects such as increased confidence in expressing ideas, language facility and strengthening collective capabilities. Avery et al. (2010) conducted similar work, analysing the use of Tablet PCs to promote project-based collaborative work and learning among groups with similar conclusions.

Ramos Elizondo, Herrera Bernal & Ramírez Montoya (2010) studied the development of cognitive skills in postgraduate students, working through mobile devices where activities conducted interacted with PDA and audio applications, video, Internet resources such as email and instant messaging, and evaluation based on Web online test. Cheung, Yuen & Tsang (2011) concluded in a research project based on mobile devices (specifically Tablets PC), and did not find a positive impact on student academic support.

3. Methodology

We analyse 25 eLearning concepts in academic literature, focusing on main factors that each definition points out as critical. The main goal of this activity was to obtain a wider definition of e-Learning. We define 11 indicators that are included in most of the eLearning definitions. The Table 1 summarized our results:

Table 1: eLearning critical factors according to literature review

Indicator		Definition
1	ICT	This factor analyses all ICT hardware and software used in learning activities: PC, laptops, tablets, Web apps, software, LMS, etc.
2	Knowledge management	This factor analyses if the concept includes knowledge processes such as application or generation of knowledge.
3	Content control	This factor analyses the degree of control that learner has on content: stop, slow down, speed up, edit, go back, go forward, skip a section, etc. and the degree of control that lecturers has on learning process and materials: edition, change, evaluation, etc.
4	Formal Learning	This factor analyses if the eLearning definition is focused on formal learning.
5	Informal Learning	This factor analyses if the eLearning definition is focused on informal learning.
6	Actors	This factor analyses all actors involved in the eLearning process: administrative personnel, students and lecturers belonging to an organization or institution.
7	Synchronous communication	This factor analyses if the eLearning definition is focused on synchronous communication.
8	Asynchronous Communication	This analyses if the eLearning definition is focused on asynchronous communication.
9	Collaborative	This dimension will determine if the eLearning definition include collaborative activities to support the generation of knowledge and learning.
10	Individual	This variable will determine if the concept focuses on individual activities to generate knowledge and learning.

We analyze each eLearning definition and determine if the indicator are included in the definition (1) or not (0). A total of twenty-five eLearning definitions were evaluated and results are shown in Table 2:

Table 2: Factors evaluated in each definition.

No	*Author*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1	(Jethro, Grace & Thomas 2012)	1	1	1	0	0	0	0	0	0	0
2	(Badawy 2012)	1	1	1	1	0	1	0	0	1	1
3	(Chan & Ngai 2012)	1	1	1	1	0	1	0	1	0	0
4	(Peng & Jingjing 2012)	1	1	0	0	0	0	0	0	1	0
5	(Chryso 2012)	1	1	1	1	0	1	0	0	0	0

6	(Tuncay, Stanescu & Tuncay 2011)	1	1	0	1	0	0	0	0	0	0
7	(Graham & ZengİN 2011)	1	0	0	0	0	1	0	1	0	0
8	(Westera 2011)	1	0	0	0	1	1	0	1	0	0
9	(Al Musawi 2011)	1	1	0	0	0	0	0	0	0	0
10	(Lominadze, Papiashvili & Asatiani 2011)	1	1	1	0	0	1	1	0	0	0
11	(Zaharudin, Nordin & Mohd Yasin 2011)	1	1	0	0	1	0	0	1	0	0
12	(Nicoleta–Magdalena 2011)	1	0	1	1	0	1	1	1	1	0
13	(Saraswathi et al. 2011)	1	1	1	0	1	1	0	0	0	0
14	(Alptekin & Karsak 2011)	1	1	1	0	0	0	0	0	0	0
15	(Jobe & Nilsson 2011)	1	1	1	0	0	0	0	0	0	0
16	(Mehrdad et al. 2011)	1	1	1	1	0	0	0	1	0	0
17	(Hyndman, Lunney & Mc Kevitt 2011)	1	1	0	0	0	0	0	0	0	0
18	(Velammal & Anandha Kumar 2011)	1	0	1	0	0	1	1	1	1	0
19	(Zehry, Halder & Theodosiou 2011)	1	0	0	0	0	0	0	0	0	0
20	(Laschewski 2011)	1	1	0	0	0	0	0	0	0	0
21	(Casquero et al. 2010)	1	1	0	0	0	0	0	0	0	0
22	(Lim, So & Tan 2010)	1	1	0	0	0	1	0	0	0	0
23	(Roldán et al. 2010)	1	1	1	0	1	1	0	0	0	0
24	(Ho & Kuo 2010)	1	1	1	1	0	0	0	0	0	0
25	(Seyed Danesh 2010)	1	1	0	1	0	0	1	1	1	0
Total		25	20	14	8	4	12	4	8	4	2

We see that the most common indicators in all eLearning definitions are:

- Hardware: included as critical factor in 100% of definitions.
- Knowledge Management: included as critical factor in 80% of definitions.
- Control content: included as critical factor in 56% of definitions.

And the less cited indicators were:

- Collaborative: included as critical factor in 16% of definitions.
- Individual: included as critical factor in 8% of definitions.

4. eLearning proposed concept

The impact on main actors mainly focuses on the learner, but we consider that it is important to take into consideration other actors that are important in the learning process (Lecturers, LMS administrator, etc.) (Facundo 2004; Prendes Espinoza & Cabrero Almenara 2007; González Mariño 2008; Ozdamli & Cavus 2011).

Technological progress has been the trigger for distance education evolution. This evolution has been based on models and complementing existing educational theories and methodologies with the use of ICTs and Internet resources Mayes & De Freitas (2007) points out that a good model of e-Learning will have to show all the strengths of the prefix 'e' (allow remote connections, collaborate users, etc.)

E-Learning could be defined as the process of creation, preparation, operation and distribution of knowledge through education methodologies and content distributed through the use of ICT collaborative and/or individual overcoming structural constraints of time and space. We think that learning process should be considered in a holistic way, where ICT is just a frontier between traditional "face-to-face" learning and emerging eLearning. The frontier distinguish between learning with all ICT tools (tablets, LMS, etc.) and traditional non technological methods (blackboard, master class, books, readings, etc.)

We summarize this eLearning concept in Figure 1. We underline that ICT in our proposed definition can be used in both: face-to-face learning and ICT based learning. For instance, the use of electronic pools, digital blackboards, web 2.0 services, etc.; can be integrated into face-to-face learning, being included in the eLearning concept. Our proposed eLearning framework focus as well on formal and informal learning, taking into consideration that both approaches can be achieved with and without ICT use.

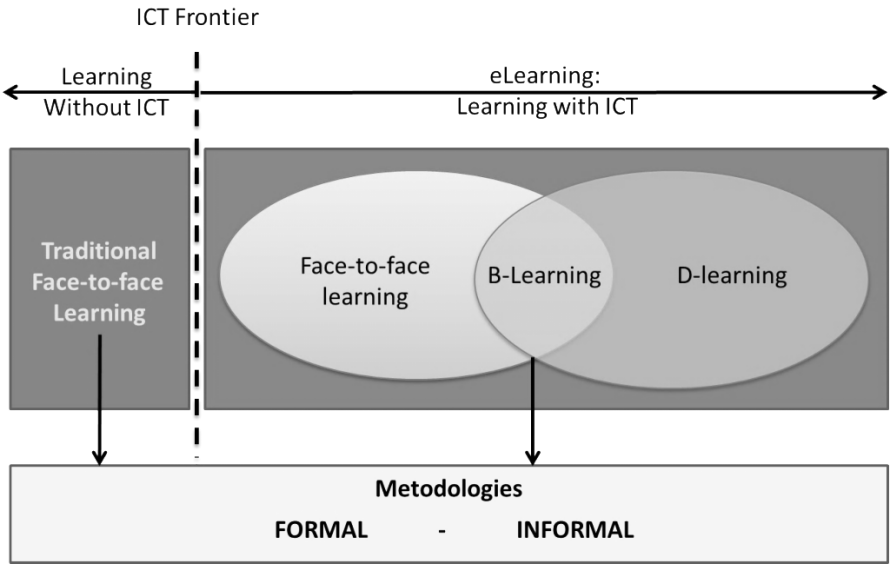

Figure 1: eLearning holistic model

5. Conclusion

In this paper we propose a wider definition of eLearning. Most of the theoretical approaches to eLearning focus on ICT usage and distance learning. Our view is that the learning process should be considered in a holistic way: learning is the end goal, and ICT is one very important mean to achieve learning. ICT integration and development should never be the end.

Future challenges will focus on properly integrating ICT into the learning processes, both in face-to-face and distance learning environments.

Overall, we conclude that in 21st Century it is almost impossible to think about learning without ICT. The trend will be the integration of ICT tools in traditional face-to-face learning, as well as the development of blended (bLearning) and Distance (dLearning).

Another trend to watch at eLearning is knowledge management. Lifelong learning requires informal ways of learning that will be managed with mobile tools. The organization of content and the way to access content will be critical areas in eLearning development.

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DESIGNING "OPEN EDUCATION": HOW DOES THE ICT-BASED SYSTEM FUNCTION AS A NEW MEDIUM OF PARTICIPATION FOR SUSTAINABILITY?

Ryoko Asai

Abstract
Information and Communication Technology (ICT) has permeated every part of our life as a daily commodity. We can access the Internet and get huge amount of information every day. Along with popularization of personal computers and highly leveraging information on the Internet, the way of learning has been changing gradually. ICT provides people with greater opportunities to learn to individual needs. Many organizations, including companies, universities and international organizations, develop and release the "open education" platform through the Internet. Nowadays, ICT is considered as a key element in the context of developing the individual as well as the society This study explores social roles and difficulties of the ICT-based education system in designing sustainable societies.

Keywords
Education, Information and Communication Technology (ICT), Internet, openness, platform, social reality, sustainability

1. Opening up an opportunity for education

Information and communication technology (ICT) has developed rapidly since 1980's and nowadays it has permeated every part of our life as a daily commodity. Especially in the present globalized society, ICT has been considered as one of the most important infrastructures to connect someone to someone else beyond the national borders and different time zones. Many people access the Internet and get /exchange tremendous information on websites everyday. Along with popularization of personal computers and highly leveraging information on the web, the way of learning has been changing gradually. ICT provides greater opportunities to understand the others' interests and to perceive what they want to learn. Hundreds universities, institutes and companies develop and release the "open education" platform based on ICT, for example iTunes U, Youtube, MITOpenCourseWare (MITOCW), TakingITGlobal and so on. These open education platforms are basically open for everyone who wants to learn by using the contents on websites for free in so far as they can access the Internet. And the movement toward the development and use of ICT-based education platform is supported and promoted by international organizations, such as the Centre for Educational Research and Innovation (CERI) in OECD and UNESCO's project "the Virtual University and e-learning".

It is possible to interpret the term "open education" in many ways and this term contains multiple dimensions in educational activities. However this term has been constituted based on the simple and strong belief that education can be improved by making educational assets visible and accessible and by harnessing the collective wisdom and knowledge of a community of practice and reflection (Iiyoshi and Kumar, 2008). This thought is very related with sustainability, and implies great possibility to lead individual knowledge to collective knowledge for contributing to make communities and societies better.

Basically the open education platform could provide and extend people's educational opportunities. Given a society well established Internet infrastructure, ICT makes it possible for people to generate social networks and virtual communities through social media, and to utilize such a network and shared knowledge to enjoy a fulfilling daily life. In other words, ICT is considered as a key element in the context of developing the individual as well as the society, for example, United Nations emphasize the importance of ICT in developing countries and active utilization of ICT in the educational arena to empower people. Needless to say, education is the one of significant factors for sustainability.

Therefore, in order to achieve sustainability in the present globalized world where ICT is positioned as a vital commodity in every social dimension, it is inevitable to collaborate between education and ICT. This study examines social roles and difficulties of the ICT-based education system in designing sustainable societies.

2. Do new education systems based on ICT foster zest for living?

It is obvious that ICT contributes to developing educational environments in many ways and lots of educational tools have been developed until now. The collaboration between educational activities and ICT use is unavoidable not only in schools but also in private and public situations, such as training of personnel in companies, doing homework at home and so on. However, how does the open education system contribute in the educational arena and to sustainability? At the present, people use social media and connect with others through it actively, and some people join in study groups or study communities on the Internet. Those people have strong interest in a certain topic and positive attitude toward sharing information and knowledge among community members. In such a case, the online educational platform could provide to people for opportunities to learn and share knowledge with other members actively as far as the platform contains interesting and attractive contents.

And also it would greatly help motivated learners find a teacher or a partner who can teach them what they want to learn, through using contents on the platform and attending virtual study communities. Moreover, it is possible for them to expand the relationship in the virtual space into the real space, for example leading more chance to get a job and earn money by utilizing knowledge based on what they learnt through online contents. Because it is possible for them to show their education experiences and careers in detail as well as social skills, to construct the relationship with others through attending online learning communities. In other words, positive activities and attitudes in virtual study communities could create chance to make the real life better and richer.

In this context, the open education platform provides greater chance to enhance the quality of life and get along in the competitive world beyond boundaries between the virtual and real spaces. In other words, the open education platform could function as a new medium of participation in the civil society, in order to achieve sustainability. However, it is not easy to make real the ideal concept of "open education" because people have many differences in language, culture, political system, ideology, thought, deployment of ICT etcetera. The way of perceiving and interpreting contents is socially constructed through conversations about that content and through grounded interactions around problems or actions (Brown, 2008). Therefore, in developing the platforms and its contents, we need to consider those not only from the perspective of "what we learn" and also from the perspective of "how we learn". Furthermore, if we aim that the open education platform functions effectively and sustainably, the perspective of "why we learn" is needed in order to motivate people to participate and use contents continuously.

3. Designing culture and society through "open education"

The open education platform provides opportunity for education greater, and is expected that its contents ignite people's passion for learning. However, there is a social risk generating serious disparities between users with high ICT literacy and users with little ICT literacy, and between information haves and information have-nots. Worse, even if people have ICT literacy well, in some countries, the free access to the websites is restricted or not allowed by governments. Why do these inaccessible situations exist whereas many people and organizations recognize that open education contributes to fostering a richer society and sustainability? Because the concept of "open education" has been originally constructed based on Western thoughts and ideologies such as "freedom of expression", "academic freedom", "democracy", "human rights", "the right to receive education" and so on. In the case of China and some Islamic countries, the governments shield people's free access to information on the web, in order to maintain their ideologies and social orders "properly", due to fears of "what people learn" and "why people learn" through the Internet. Additionally, the open education platform would not develop and work well in the society where the government infringes on the

intellectual property right and put censorship on contents routinely. How to construct and use platforms and contents depends on a political regime and thought strongly. In other words, constructing the open education platform and contents play a role of designing culture and society.

Active interactions among people through the Internet reconfigured people's role in the cyber space. In the early stage of the digital age, almost people had been only spectators at the arena where information was exchanged by a few users those were familiar with ICT. However, the popularization of personal computers and Internet access has changed people from spectators to creators, in other words, from passive spectators to active participants (Jenkins, 2006, Balsamo, 2011). This shift could enrich open educational contents with a myriad of knowledge of other participants. But whenever we see drastic changes, difficulties or negative sides always are observed as well. First, it is unavoidable to have difficulties in the translation tacit knowledge into explicit knowledge. Every participant has different experiences, knowledge and cultural contexts, and sometimes it is difficult for them to express those differences in words or to transfer explicable knowledge for others. Secondly, not all information and knowledge are useful and educational. Some of participants might try to assert the particular thought or polarizing idea and inculcate it upon others, for example extreme ideas, false information, demagogic messages and inflammatory observation. However, Judging what is right/false or good/evil, and which idea is moderate/extreme are very different depending on cultural contexts that every society has. Of course some parts would be similar to other participants' thoughts but people rarely have completely same thoughts as the others ones. The third difficulty is there, that is, the most of open education platforms are managed in the certain languages at this moment, in many cases, those are run by big companies, organizations or universities mainly in western countries, and the most of contents are distributed in English even if not westerners create those contents. Therefore, contents makers and participants are affected more or less by western thoughts. As proof of this, some countries control and shield the people's access to particular websites, for example blocking the access to Facebook and YouTube, sometimes Wikipedia, no matter what the reason, in China.

In constructing web services in non-English speaking countries, in fact, it would be easier for contents' makers to design and create contents in their own languages because of usability and accessibility for local users (Umeda and Iiyoshi, 2010). And they could be well aware of the needs of users easier, and ascertain the reactions of users toward their contents directly and more responsively. However, given the characteristics of the Internet, the universal access makes open educational contents richer and gives people more opportunities for learning, regardless of languages, locations and so on. In the situation that English is used commonly and globally, it is quite expected that many of the open education platforms and contents are developed in English. On the other hand, in order to value and respect cultural differences and harness diversity, we need to approach "open education" not only from the global perspective and also from the local perspective.

4. Social responsibility

Developing education platforms on the Internet is very much related with designing culture and societies, the process of open education and its consequence strongly affect sustainability as well. And, needless to say, education programs definitely empower people not only in the cyber space but also in the real space. However, especially on the Internet, no matter how many good educational materials and tools are open in public and available to use for free, it is very difficult for a single person to use those thoughtfully and effectively as an educator or as a learner. Because, in many cases, especially in the case of a learner, a single person does not have enough practical knowledge to fully utilize other people's knowledge alone and by oneself (Umeda and Iiyoshi, 2010). Practical knowledge is fostered through the real educational practice, and which belong to tacit knowledge. Therefore, in getting involved in education on the web, it is required to devote sustained efforts to express and open knowledge in order to be understandable for others. Sustained efforts blur the boundaries between educators and learners, and all participants get involved with developing the open education after all. In this context, every user assumes responsibility for making the open educational contents more abundant and richer. Whereas participants themselves contribute to make their knowledge visible and explicit, the platform and contents' suppliers need not only to construct the platform and contents but also to develop the support tools to transform tacit knowledge into explicit

knowledge. This means that the ICT-based educational system is established through the continuous human-computer interaction.

The open education systems are developed and supported by many suppliers and users, especially the quality of contents depends heavily on interaction among the system, suppliers and users. Hence, it is unavoidable to consider the problem of "many hands" in the process of construction and operation of the open education system. The problem of "many hands" might pose the absence of responsibility when the system causes a problem socially. In particular, since education is considered as the essential foundation for the prosperity and sustainability of the society, the open education distributors and contributors assume great social responsibility. In order to develop the open education systems for sustainability, we need to evaluate and operate the quality of the system constantly and accurately. And we could evaluate it from three different points: the quality of contents, media, and the information system (Murata, 2005). The quality of contents is evaluated based on reliability, purposiveness, accuracy, coherency, integrity and currentness. The quality of media is assessed by adequacy and appropriate access control. The quality of the information system is evaluated from the viewpoints of reliability, usability, consistency, maintainability, flexibility and confidentiality. Through those evaluations and continuous human-computer interaction, the open education system can contribute to empowerment of people and realization of the sustainable society.

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ICT SUPPORTED CRISIS COMMUNICATION AND DIALOG

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Abstract

This study explores how people use social media under serious social conditions, and how social media affects people's behavior after a disaster based on the case of the March 2011 disaster in Japan. In this critical situation, where existing traditional media like phones, television, radio and newspapers did not work well, the Japanese exchanged and received information through social media. In fact, some victims were rescued based on information via ICT and social media. Corresponding to people's need, social media provided various services to support people immediately after the disaster. Therefore, it seems that ICT and social media play an important role in fostering a social network leading to horizontal communication, critical thinking and dialog; supporting social capital. This paper discusses characteristics of the relationship of ICT and social capital, and their role in improving people's lives and supporting democratic communication as well as the difficulties in people bonding together through social media.

Keywords

Communication, crisis, democracy, dialog, Information Communication Technology (ICT), self-critical thinking, social media

1. Disaster and communication

On March 13th 2011, Japan was hit by the Great East Japan Earthquake, which was of magnitude 9.0. It was called the Higashi-Nihon Daishinsai in Japanese. Serious damage took place over an extensive geographic area; especially the coastal region was devastated by a tsunami. An enormous tsunami took everything away. People, vehicles, buildings, houses and almost all other objects disappeared from the land. The disaster disrupted almost all public utilities, including electricity, gas supplies, water, radio, telephone, TV and Internet systems. Given the massive damage, people utilized many kinds of media in order to know what had happened to them, their communities and the country. Especially social media played great roles to check families' and friends' safety, and to know the situation where they face. At the same time, some people living in not serious damaged area started to support victims as a volunteer in many ways. In addition to conventional voluntary work, some volunteers worked on contribution to a society through utilizing the Internet as "information volunteers", as well as ICT companies.

For example, the global ICT company Google placed "Person Finder" on Google Apps immediately after the Japanese earthquake, using its scheme that had become relatively sophisticated through experience with other disasters in the past, such as the 2010 Heidi earthquake or the 2005 hurricane Katrina in New Orleans. "Person Finder" became the most useful social media platform in Japan at that time through cooperation with the Red Cross and the Nippon Hoso Kyokai (NHK).

However, in severely damaged areas after the Great East Japan Earthquake, most of the conventional media were destroyed by huge tsunami waves and many people were stranded in many places. People had no tools to find out about the safety of their families and friends. How did people register the safety on the Net? They wrote message cards and put it on walls in a refuge where they evacuated. However, it was very difficult for them to send messages to people outside a refuge. Every refuge had message boards on the wall, and the evacuee wrote and posted message cards that included their names or other private information. In some areas, a few people accessed the Internet via mobile phones for a short time. They took pictures of message boards by using mobile phones and uploaded these to Picasa pictures websites. Many volunteers who were living in areas that were not so seriously damaged checked on those pictures through computer monitors, wrote down every message on paper by hand and posted those messages on "Person Finder" instead of the victims themselves. And, some volunteers worked on sorting huge information while many users sent tremendous information to

social media. Under suffering from massive disaster scar, people collaborated for social contribution by utilizing ICT, beyond boundaries between public/private, organization/individual, or center/periphery.

2. Using both old and new media

The massive Japanese disaster of 2011 harmed the coverage of mass media because it destroyed TV towers or broke telephone cables in the devastated area. For example, TV news programs continued to broadcast live reports not only by using conventional broadcasting systems but also through cutting edge technologies. In other words, existing media collaborated with "new" media in sending information to people. In particular, TV companies distributed their TV programs on the Internet at the same time that they broadcast on TV. TV companies and big Internet companies collaborated with each other and enabled a fusion between TV and social media. The TV reported the original news accompanied by people's tweets from Twitter on the TV screen, and social media delivered not only information from users but also streamed live videos from TV programs to their websites. Thus people living in the non-disaster area watched real-time events through mass media and knew what happened at that time. However, people living in an affected area could not know the situation they faced after the disaster.

ICT and social media complemented the absence of mass media with its communicability and transmissibility, with cooperation and collaboration between mass media and the Internet. Many people used social media like Facebook or Twitter, and some ICT companies played great roles in distributing information using their technologies. As already mentioned, Google created a special website called "Person Finder" to find and check on people's safety by collaborating with NHK. Twitter set up a hash-tag in order to gather information efficiently (Computer Technology, 2011). Some Internet server business companies provided many mirror sites for users. However, the fusion did not last not for long. A few weeks later, the fusion ended and both media again delivered information separately just as they had done before the disaster.

People, including both victims and non-victims, exchanged much of information in order to either survive or to support others through social media. Twitter was especially useful to inform where victims were and who needed to be rescued. Why did Twitter contribute to exchange information after the disaster? This was because of its characteristics: quick reporting, convenience (simplicity), propagation (transmission capability) and diversity (Computer Technology, 2011). A limited number of characters made the messages clearer and easier to be read by others. In the fusion between TV and social media, people got a broad range of information on the disaster through the TV news while they checked on the reality and local information through tweets. Many users relied on tweets about local information that sieved huge amounts of information. It is considered that the reasons for this situation are that users had a certain level of media literacy, and shared a thin trust in other users in Japan (Computer Technology, 2011; Kobayashi, 2011).

3. Communication and cooperation through ICT

In this social crisis, many people thought that it was natural to help and complement each other based on the Japanese traditional virtue of "Nasake-ha hito-no tamenarazu": it means that sympathetic behavior (or charity) is done for oneself, and not for others. In other words, the good you do for others is good you do for yourself, or what comes around goes around. After the disaster, social media were used by many users to reflect a virtue of mutual support. In this social context, two types of false information flew onto the Internet as well as correct and useful information. One type of false information is categorized as disinformation. It includes demagogic information, which has the malicious intent to make a society disordered or confusing. Another type of false information is "expired" information, which is spread based on humanity or goodwill, but which, by the time others gets the information, is already useless because of the time-lag involved in sending information (Google, 2012; Computer Technology, 2011; Kobayashi, 2011). Therefore, in a period of social

chaos, people are more required to possess the basic literacy of judging credibility and information "freshness".

Conventionally, the function of mutual support used to be carried by a community, such as family and neighbors. In the real world, people form real-existing communities around their families or residential areas, where they can exchange their communities' information, or sometimes rumor or gossip, in the streets, supermarkets or somewhere else in real space. People maintained close communications and lived by helping each other through attending community events and maintaining relations among neighbors. However, participation in community organization in Japan has decreased since recent years (Ministry of Land, Infrastructure, Transport and Tourism, 2006).

Instead, after ICT grew to be used by many people, they can exchange information, without meeting anywhere in the real world, and can contact others living in other communities through the Internet. Now people can use new media via social media like blogs, social networking services (SNSs) and personal websites. These new media offered a great opportunity to know others and feel for each other socially regardless of where they live.

4. Development of open communication and dialog

The way people used ICT and social media after the disaster in Japan brings two theoretical contributions to the discussion on development of open communication and dialog. Firstly, it shows how institutions may affect open development projects. It identifies the relevance of considering the institutional context when planning open development initiatives, since powerful social actors are able to mobilize against institutional changes, which challenge social structures from which they benefit. Secondly, it illustrates different models of appropriation or balance of control of technology when facing state constraints to open development projects, and it contrasts centralized and decentralized structures in using technology and producing content. These arguments are explained below.

Here we can see the complex interaction between the forms of appropriation of technology and the institutional environment. Internet tools per se do not define whether the appropriation fosters more democratic social structures and the institutional environment does not define how technology is appropriated. Internet tools offer a unique opportunity for intensifying citizen participation and freedom of debate. However, the state has mechanisms to limit and frame this expression of dissent through filtering and censuring Internet spaces, in association with other legal and illegal punishment mechanisms (that range from prosecution and imprisonment, to torture and execution).

Activist movements show that it is possible to overcome state censure through the use of technical tactics (for example, changing URLs, creating proxies, using portals, and linking decentralized groups of blogs). However this implies that activists need to have substantial technical knowledge to operate in this environment, overcoming the state censure and surveillance. Even more difficult, readers and contributors also need to have considerable technical knowledge to find related websites and blogs. Indeed, most activists operate through websites and blogs that are hosted in other countries; it would be difficult to overcome the Iranian censure operating only locally. In addition, citizens in Iran may avoid reading activist content, fearing punishment. In such a repressive institutional environment, the availability of tools and contents are not enough to engage citizens in open development initiatives, especially when they do not have knowledge of the use of Internet tools and do not understand the actual risks of engagement. Fostering open development initiatives may demand the development of technology, which does not demand much technical skills from users and audiences.

The cases of the Japanese disaster and of the Iranian activist movement also point out that a decentralized strategy of content production, and loosely coupled networks of websites and blogs, may be an interesting tactic to overcome state censure in open development projects. This model is more democratic in allowing the emergence of a broader range of opinions. However, states may be efficient in generating filters and in identifying contributors and supporters. The more efficient the mechanisms for identifying users, the more difficult it is to use Internet-mediated communication as a means to organize democratic communication and dialog in non-democratic environments.

The relevance of the institutional environment can be expected to be present in other initiatives that use of information and communication technology for fostering open development. Here we referred to two examples that illustrate the interaction as means of fostering freedom of expression. Other or future studies would be necessary to investigate how the appropriation, or the balance of control of information, and communication technology for open development, is affected by the institutional environment; in the same or in other contexts.

Our examples and the following discussion indicate the limitations of Internet tools as instruments for fostering open development. Although a certain level of freedom of dialog has been reached through virtual interactions, the mobilization of citizens through the Internet has not yet been able to change, for example Iranian institutions substantially. That means that the resilience of institutions should be taken into account when practitioners are planning for open development. Understanding institutions, and their related legitimating and sanction mechanisms, may help to foresee obstacles to the changing of power structures which are an inherent consequence of open development initiatives.

5. ICT for dialog and democracy

ICT can contribute to this process by making information accessible and therefore facilitating citizens' participation in different kinds of tasks like searching for missing people or even for political decision making. It can support openness and by that invite people to be more aware and active. Primarily, it can support horizontal communication among people. Issues that are of interest to few people or to people that for some reason have difficulties to contact each other by traditional means may be neglected in other traditional communication processes even though such issues may be of vital significance to them. ICT can easily overcome such difficulties and provide a powerful tool to connect, inform and coordinate people's actions. People can find out the right answer or truth for themselves through constant communication by using ICT when there are points that are doubtful and unclear. Most important, ICT and ICT mediated communication can be structured in such a way as to support self-critical and systematic thinking, which is the skeleton necessary for achieving difficult tasks in crisis situations, and for maintaining successful democratic processes.

The way we solve problems and make decisions has been at the focus of philosophy. Since ancient times the issue has been how to think in the right way. Skills, abilities, methods and processes have been investigated. According to Plato (1992) philosophers do not have the right answers but they can find the right answers. They have the skills and they can use the right tools to discard false ideas (aporia). Philosophers think and act in a democratic way among themselves. But anybody who has the ability to philosophize, to think self-critically, systematically, scientifically, i.e. has the Aristotelian (1975) virtue of phronesis or the Kantian (2006) skill of autonomy, and acts according to this, belongs to a functioning community, to a democracy, together with other people; a democratic dialog or communication in Habermas's (1988) terms.

Access of relevant information is a necessary condition for finding the right solution to a problem or making the right decision. Such information triggers and maintains the psychological and societal processes lying behind the achievement of important aims for individuals and groups. Democracy demands dialog, but dialog is not possible among citizens who are totally convinced about the truth of their ideas. A participant in a dialog must have a critical attitude toward own beliefs; otherwise a common search for a better decision is not possible. ICT tools can train and support unconstrained, self-critical, systematic and holistic problem solving, decision and law making. Democratic groups and societies need access to information. Whether well-organized and strong stakeholders can guarantee it more or less for themselves the same is very difficult for citizens to achieve. ICT can easily provide information about stakeholders, interests, needs and other relevant aspects. However, the available form, content and amount of information in society or in politics, which are controlled by the strongest stakeholders, have as their main goal to control or/and to constrain systematic and critical thinking. Therefore, to take advantage of ICT features in developing better crisis communication and political procedures, it is necessary to create rules and laws that can guarantee openness and access to all relevant and necessary information.

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HOW TO RESPECT PRIVACY OF ENERGY CONSUMERS WHILE IMPLEMENTING SMART METERING SYSTEMS

Barbara Begier

Abstract
Pilot implementations of smart metering systems have become a subject of discussion among energetics and also in scientific circles. But no voice of energy consumers was heard till November 2012, although innovative energy meters have been already installed at their homes. In author's opinion, diversified needs and opinions should be considered – those coming from creators of a solution, its potential beneficiaries, and from energy consumers. Results of the conducted research concerning social acceptance of smart metering system in Poland have been described. Some results are related to privacy protection in that area.

Keywords
privacy; smart metering; energy consumer profiles; agile methodologies in software engineering; cooperation with energy users; questionnaire surveys

1. Introduction – a need to cooperate with energy users

To build a social consciousness of energy consumers becomes an important element of energy politics in accordance with social interest and in conformity with directives of European Union. Announced changes tending to diversification of energy sources, reduction of energy consumption, and innovative methods of its control and metering involve various organizational and technical activities including computing solutions. On the other hand, these activities meet unknown, to energy sellers, reaction of energy consumers. It's necessary to get energy consumers interested in the volume of their consumed energy. Their positive attitude towards challenges concerning protection of natural environment and resulting in increasing energy prices may decidedly become one of the most important success factors in the undertaken project.

The observed growing demand for energy bears a need to economize its consumption. It refers also to an electrical energy and underlies an idea of smart metering. Pilot implementations of such systems are a consequence of recommendations given in the Directive 2009/72/WE of the European Parliament and the Council of Europe. Smart metering provides organizations of energy selling with monitoring energy consumption (including each individual consumer's home), and fast discovering failures in the power supply. It also makes possible to cut off or reduce remotely the energy supply when a consumer is behind with his/her payments for energy.

Various institutions including academia are involved in preparation and implementation of smart metering systems along with analysis of their technical and economic results but no consumers' voice was heard in these discussions. A lot of attention has been dedicated to installation of new electrical meters being important elements of the smart metering system. But there were no consultations with energy consumers who become users of these innovative meters. The author claimed that the lack of their opinions could generate the wave of protest against these solutions − it could result in similar actions like these, observed at the beginning of 2012, relevant to the signed (or not) ACTA (*Anti-Counterfeiting Trade Agreement*) agreement [Begier B., 2012]. Although it is hard to deny someone's right to secure his/her intellectual property, the content of ACTA was not preceded by social consultations.

These protests should be a warning for energetics – even the right idea may be rejected or boycotted if the side of users has been ignored. The undertaken activities should concentrate not only on technical aspects of AMI (*Advanced Metering Infrastructure*) and HAN (*Home Advanced Network*), possibly joint to AMI, but also the aim itself should be learnt by consumers. Their opinions, expectations, and

fears should be known to all interested parties. A great *informational campaign* is required − there is a need to explain potential benefits of the undertaken project to inhabitants. But it may be not enough.

The most important problem is if and to what degree energy consumers will accept intelligent metering system. Citizens' attitude to e-government remote software systems seems to be the good example of problem here. The aim of research described in [Gauld, 2010] was to specify what categories of people use this kind of software and, on the opposite, who do not use it for any reasons. In other words, the aim was to find reasons of *digital divide* and to identify *potential barriers* to make use of offered digital services and benefits of an informatization.

Installation and operation of smart metering systems in private homes bear problems of ethical nature. The conducted research [Research, 2012], described in the presented paper, has been focused on energy consumers' attitude to smart metering system, their knowledge about new solutions, and also on learning people's threats in this area. Some issues concerning respect of privacy have been raised − against system authors' intention and social expectations there is a probability that some persons (criminal gang, secret service, bailiffs, hackers) will sell private data and/or will be able to track citizens and their style of living. It is potentially and technically possible to learn the time they return home (they turn on electrical devices), period of their holiday trips (no devices are used), necessity of saving (they turn on electrical devices only when the cheapest rate applies), etc. In other words, energy consumers may feel watched or even investigated (under surveillance in the worst case), and they will not be willing to tolerate it.

There is a need to make employees of energetics aware of inhabitants' rights to *preserve and protect their privacy*, sensitize to this problem, and teach to respect it. Only cooperation with energy consumers helps convincing them to smart metering systems and enjoying their confidence.

2. Some methods applied in software engineering adapted to ensure cooperation with energy consumers

Selected methods applied in software engineering, especially those recommended in *agile methodologies* based on *cooperation with users* during software development [Principles, 2001], may be adapted to ensure cooperation with energy consumers. These methods are focused on constant cooperation with users during software development to produce software product which will satisfy their users. The common aim is to share confidence at both sides. Human beings expect to be respected and treated with dignity. For example, an idea of *focus groups* has been applied in practice since 1993. A focus group is intended to learn people's opinion about a specified product or concept. It is applied in social sciences, marketing, and also in software engineering. This method has been also applied in the reported research.

One applied technique is not enough to ensure quality and good mutual relationships between producers and users/clients. Another recommended technique is based on the EUCS (*End-User Computing Satisfaction*) model [Doll & Torkzadeh, 1988] to measure user's satisfaction with a given software product. Specified criteria and their 34 measures, based on the EUCS model, concerning energy consumers' *satisfaction with a developed technical solution* have been proposed [Begier, 2009].

Cooperation with users requires learning who users are and what do they expect. The technique of *user profiles* is widely applied in software supporting e-business. Specified items are included in a profile in each application. Energy consumers' profiles, much extended than those applied nowadays in energetics, have been proposed [Begier B., 2012]. They include more elements than only the total energy consumption and its time characteristics.

One of important fields of software engineering is *risk management*. It requires identifying risk sources, then estimating its probability, analysing its impact on a software process, and building the RMMM (*Risk Monitoring, Mitigation, and Management*) plan. Risk management should also consider risks concerned with privacy protection [Gotterbarn, 1999, Gotterbarn & Rogerson, 2005, Begier, 2010a].

A *questionnaire survey* is a relatively cheap technique that has been several times applied by the author to learn software users' opinion concerning quality of the given software product [Begier, 2011]. Surveys are intended to obtain a feedback from users and to receive the valuable material for software designers and programmers. It may also help to learn the level of users' satisfaction with the given technical product, and to assess selected features of the developed software or other technical solution. This technique has been applied in the reported described research.

Cooperation with energy consumers may bring expected benefits as it has been proven many times in software development [Kujala, 2008]. *Users' involvement* may help respecting social and ethical values [Begier, 2010b] – the threat of privacy is possible in the described area.

3. Research on social acceptance of a smart metering system

3.1 Aim and structure of the research

The originator of the research on social acceptance of the proposed smart metering system in Poland, in reference to automation and informatization of electric power system at the side of its communication and settling accounts with energy consumers, was PTPiREE (Polish Power Transmission and Distribution Association) [Begier P., 2012] and partially inspired by the author of the presented paper. The PTPiREE association was the employer of the described research, financed by the National Fund of Environmental Preservation and Water Economy.

The described research, conducted in November 2012, was intended to learn an opinion of electrical energy consumers on the general subject specified above. Its aim was to learn respondents' knowledge about projects concerning environment protection and about ways and individual actions which may lead to energy saving. At the same time, it was intended to learn energy consumers' inclinations to spend money on energy consuming, and to finance energy saving (buying energy-saving equipment, etc.). The next aim was to learn respondents' opinions about important aspects of smart metering:

- What is *functionality and usefulness* of a smart (remote) meter of energy; what are expected benefits from smart meters?
- What are needs of energy consumers in the area of required *communication channels* concerning the smart metering system?
- What are *benefits from and barriers against* installation of smart meters?
- Which one of the offered three concepts on how to arrange an *informational campaign* about smart metering is well accepted?
- What are *expectations* concerning continuity of energy supply and energy parameters?
- What are potential threats against and fears for privacy violation?

The last one is the most interesting problem from the author's point of view although all of them are closely bound together. The base of research was potentially all community of energy consumers in Poland. In the term of conducted research, the energy consumer is an adult person who pays bills for the consumed energy. The described research concerning all listed above subjects has been performed parallel in three ways: quality research conducted in four focus groups (8 people in each), and quantity research based on the method of CAPI (*Computer Assisted Personal Interview*), and CAWI (*Computer Assisted Web Interview*).

3.2 The Focus Group Interview

The methodology of Focus Group Interview (FGI) has been applied to conduct the research in four groups: two in Poznan and two in Siedlce. Poznan is located in the western part of Poland and Siedlce in the east of the country. The first one has the relatively advanced economy and the last one represents rather the rural area. The participants of FGI were men and women between 20 and 60 years of age.

The scenario of a meeting of each focus group has been specified. At the beginning, the moderator introduces himself and presents an aim of a conducted research and agenda of a meeting. The participants' safety and security of their likeness have been guaranteed. Then a conversation begins starting from a question what is important in life. Is an environment protection important in it? What national and local initiatives concerning environment protection are known to the audience? How do participants understand a notion of energy saving? What activities in real life are the opposite to this idea? What threats does the wastefulness of energy consuming bring for the future? What could individuals do to save environment? What are individuals able to do to save energy? What activities can be undertaken in a household?

Next part of questions in a discussion has been related to finances spend on energy. So the typical question is what is a regular bill for electrical energy? Do the people understand all components of a bill? What can be done to ensure that bills will not decidedly grow in the future? Do discussants consider the energy class before they buy a new electrical device? Do they use the energy-saving lighting (bulbs) and energy-efficient technologies? Do they know the offered tariffs of electrical energy? Are they inclined to use electrical devices in the specified time (at night or other period not in energy peak demand) to save energy? Does it refer also to use washing machines and irons? If not, are they ready to change their habits in that area? Are they ready to change time of using the most energy consuming devices?

Next part of a meeting is dedicated to inhabitants' expectations. What is the most important in using electrical energy? What sad effects in a household may result from unexpected breaks in energy supply? Is it possible to reduce the planned and also unexpected breaks? What are quality parameters of electrical energy? What is a stability of voltage?

Then it is a good time for questions concerning new ideas. Have the participants heard about a smart metering system? What are basic functions of a smart meter? Who pays for these devices? What additional functions do inhabitants expect from them? What may be benefits from smart metering for an average household? What threats may bring such device and why? What are the proper ways of informing inhabitants about smart metering system and its potential benefits? Participants of each focus group were informed what media are considered here: mass media (TV, radio), information written on a bill for energy, separate registered letter, regular letter, sms, e-mail, information available in a public place (staircase, hall, bus station, etc.). Which one is preferred by them?

At the end of a meeting its participants are asked if there are some other problems they think about which were not discussed on a meeting. Each meeting has been planned to last about two hours. All statements expressed during the discussion have been carefully recorded.

3.3 Participants of questionnaire surveys

The method of a questionnaire survey has been chosen to realize the intended research. Basic criteria to recruit the potential participants of a research were the following: age, sex, kind of town (place of living), and region of the country. Respondents were adult men and women. Their level of education (from basic to higher) has been also considered as an additional criterion, then type of a house (multi-family or single-family house), and income higher than or lower than the average in the country. A social sample, circa a thousand of persons, has been randomly selected on that base to participate in the research. Usually bills for energy are paid by a house/apartment owner or tenant. This fact was the reason that only people from 25 years of age were finally accepted for the research purposes. So the number of respondents decreased to 963 persons – the others were too young.

These respondents answered questions directly, it means using face-to-face method. They trust the authorized person during an interview and feel safely at the direct meeting. They have expected that some questionnaire items may be hard to understand and answer them correctly so the help of an interviewer is needed.

The other sample of 302 persons based on the same criteria has been randomly selected from the organizer's base of Internet respondents. They fulfilled a questionnaire survey via Internet. Technical barriers were excluded because most of energy consumers pay their bills via Internet.

4. Results of the research

All data cited in this section come from the described research [Research, 2012]. Many questionnaire items concerned energy sellers themselves and their services for energy consumers. For purposes of this paper only some results of the questionnaire survey have been selected including answers concerning pro-ecological awareness and behaviour, for example. The question "*Do you pay your attention on environment protection every day*?" was answered affirmatively by 72% of social respondents and as many as 95% of those using Internet. The next question was "*Do your personal activities have any impact on environment protection on the global scale*?" This time, 77% of social respondents and 83% of Internet sample have answered affirmatively.

Declared pro-ecological activities are listed in Table 1. It is interesting that respondents using Internet seem to present more ecological behaviour than all population. But experienced pollsters have no doubts at this point − respondents answer honestly in direct conversation whereas remote anonymous respondents try to show themselves better than other people so they answer as they think they should.

Table 1. Results concerning environment protection

Questionnaire item	Whole sample (963)	Internet (302) respondents
I turn off unnecessary lighting and devices	60%	91%
I segregate rubbish	51%	84%
I save water	54%	84%
I use fluorescent lamps and/or LED bulbs	28%	73%
I put worn out batteries into special container for utilization	25%	81%
I use energy-efficient devices (RTV & other home devices)	26%	63%
I hand over my old home devices for utilization	18%	66%
I turn off the stand-by equipment	18%	49%
I have resigned to use energy-intensive devices	8%	18%
I do nothing	9%	1%

In pollsters' view, people do not usually lie in direct conversation. Each time a pollster asks questions at respondent's home so he/she is able to confront answers with reality − if it is true that a person segregates rubbish or keeps old electrical devices at home, for example. On the opposite, Internet respondents are accustomed to improve their image and at least to include only good points in their profiles maintained on Facebook. This observation may question credibility of any Internet survey! Also potential employers declare in direct discussions that they do not believe written declarations of candidates for a job − their declared skills are often not confirmed in practice. And differently, in direct conversation candidates tell the truth because their skills are easy to be checked any moment.

There were taken into consideration four age brackets: 25 to 34, 35 to 49, then 50 to 64, and 65 or more years of age. It is worth emphasizing that people in the 35 to 49 age bracket declare the greatest awareness of the need to protect environment and also better knowledge of a notion of smart metering.

As many as 61% social and 25% Internet respondents do not know *functions of smart meters* of electrical energy. The others declare that smart meters provide:

- exact and reliable measurement (9% and 7%, respectively),
- the current volume of consumed energy in a given period (8% and19%),
- reading of a meter without any involvement of a human reader (6% and 10%),
- help in energy saving (2& and 7%).

Internet respondents add more features. For example, they know that smart meters:

- make available consumer's control of consumed energy before a bill comes,
- on demand calculate the cost of the consumed energy,
- show the calculated cost using various tariffs,
- make possible to pay just for the consumed energy (bills are not based on a forecast),
- prevent from stealing energy.

In all respondents' opinion the most important strong point of a smart meter is a fact that inhabitants pay just for the consumed energy (40% and 38%, respectively). The next benefit of a smart meter is possible control of consumed energy (30% and 21%).

In answer to question concerning *weak points of smart meters* the following sentences were formulated (social sample and Internet respondents, respectively):

- I do not notice any weak points (24% and 12%).
- Thousands of meter readers will lose their jobs (22% and 12%).
- Energy seller may change the value of an automatic reader (equally 17%).
- Smart meter consumes additional energy paid by a client (15% and 3%).
- In a long period of time, just energy consumers will cover all cost of a smart metering system (13% and 23%).
- Data transferred remotely may be insecure/stolen (11% and 9%).
- The remote reading of a meter is too exact and bills may be higher than before (8% and 4%).
- Potentially, invigilation may occur because a smart meter makes possible to learn some habits of an energy consumer (8% and 13%).
- I don't know (23% and 9%).

Respondents were asked to list *potential threats* of smart meters. The most important was that a smart meter "knows" when people are at home (they use more energy that time) and what are periods when they are usually outside (potential thefts may take place). Some respondents say they do not want anybody knows their habits like the time they go to work or to bed.

The *preferred way of being informed about smart metering*, including its strong and weak points is (social sample and Internet respondents, respectively):

- Letter sent by traditional mail (52% and 25%)
- Information attached to the bill for energy (27% and 18%)
- Informational campaign on TV (27% and 4%)
- Information available for inhabitants on staircase (12% and 4%)
- E-mail (11% and 39%)
- Personal visit of an authorized representative of energy supplier (10% and 3%)
- Information transferred by an owner of a house (8% and 1%)
- Available telephone info-line (5% and 1%).

It is interesting that an age of a respondent play almost no role in the above answers. For example, 50% of respondents below 34 years of age and 57% of respondents in 50 to 64 age brackets prefer the paper letter sent through the traditional post. And an option to be informed by leaflet attached to the bill for energy was preferred equally by 25% of respondents in both age brackets mentioned above.

One more group of questionnaire items concern the *most important elements of informational campaign* required to introduce the smart metering system. Social and Internet respondents expect:

- Explanation how a smart meter works (41% and 59%).
- Information when and why new meters will be installed (35% and 42%).

- Exchange of meters will be on energy seller's cost (35% and 72%).
- New meters cause that people pay for the really consumed energy (34% and 37%) instead of using bills based on a forecast.
- Information about who covers cost of functioning of a new meter itself and energy consumed by it (24% and 26%).
- Protection of data concerned with electrical energy consumption at home; those data are transferred from smart meters (21% and 25%).
- Explanation what happens with a meter in the case of a break of energy power or another defect in the power net (20% and 11%).
- Ensuring that a new system will improve a detection of failures in the power supply and fast repair of damaged net elements (16% and 9%).

Some respondents answered that question "*I do not know*" (8% and 2%).

5. Conclusions

The need to develop cooperation with energy consumers or their representative group has been justified. An adoption of some methods applied in software engineering has been confirmed in cooperation with energy users. The reported research shows that the cooperation may start from working in focus groups and conducting a questionnaire survey to learn what energy consumers know about smart metering and what do they expect. The aim is to persuade people to smart meters as tools that help to save energy. An informational campaign is required to realize it.

The representative social group of energy consumers has been selected to realize the intended questionnaire survey in direct conversation. One more numerous group, using Internet for communication purposes, took also part in the research. Various items have been included in a questionnaire. After careful analysis of obtained answers the proper forms and content of informational campaign may be initialized.

Valuable although non-technical part of a questionnaire has been concerned with possible threats of privacy of energy consumers. This kind of knowledge may help to ensure people that potential sources of recognized threats will be technically and organizationally eliminated.

The item referred to the level of wealth was missing in the questionnaire. It was reasonable because Polish inhabitants are afraid to be asked about their financial abilities. But on the other hand, tendency to save money, number of possessed electrical devices at home, total floor area of a flat or house, etc. result in a total amount of consumed kilowatt-hours of electrical energy per year. Thus a question concerning the level of life conditions should be somehow included, however it is still discussible.

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BIOMETRIC AUTHENTICATION PRACTICES:IDENTITY AS CONVENTION

Maren Behrensen

Abstract

The focus of the discussion of identity in the context of new biometric technology is usually on social identity, i.e., the way in which this technology can be used to regulate status and access to social resources. Taking up some insights from these discussions, I suggest that they should be complemented with a metaphysical analysis of personal identity.

I defend the following main claims:

- Personal identity is not a metaphysical fact, but a set of conventions.
- Identification documents such as biometric passports form a part of such conventions.
- The legal rules that govern the use of such documents (e.g., rules regarding technical standards for passports or rules regarding the acceptability of breeder documents) should be subject to careful ethical scrutiny, since they can determine whether a person has an identity or not (which in turn determines her access to certain resources, and whether or not she will be able to enjoy certain rights and freedoms).

I begin with an overview of the role of identity in current debates about biometric technology. In section 2, I provide a very brief summary of the contemporary metaphysical debate about personal identity, drawing on the work of Derek Parfit. In section 3, I take issue with Parfit's claim that "identity is not what matters," suggesting that even if identity is a convention rather than a metaphysical fact, it is a convention that is of the utmost importance to how we understand ourselves and our lives. In section 4, I apply this thought to the use of biometric technology as a means of inclusion and exclusion in an international context.

Keywords

biometric identification documents, metaphysics of identity, social identity, conventionalism about identity, global justice

1. Introduction

The major ethical and technological challenge in the development of e-Passports (and other uses of biometric data for identification and authentication purposes) is to find a proper balance between communal values like security on the one hand and respect for individual rights on the other (cf. Irish Council for Bioethics 2009: 59-98). Technology developers operate under the imperative to create reliable means of authentication while safeguarding the data used in the authentication process. It is thus not surprising that ethical criticism of new biometric identification and authentication practices has focused primarily on the privacy of those who provide the biometric data: emphasizing, for instance, the special sensitivity of the bodily data used, or the risk for "identity theft" and "function creep" (cf. Alterman 2003, Juels et. al. 2005, Lyon 2008) while proponents of these practices tend to emphasize a projected increase in security and convenience, especially in air travel (cf. European Commission 2003, Ng-Kruelle et. al. 2005). Yet proponents and critics largely agree that the main ethical and technological challenges in this area arise from the particular relation of the representation of personal identity (the data stored in the passport) to the identity of the person carrying the passport.

Technological and logistical concerns revolve around the issue of finding data sets which can adequately match an authentication document with the true identity of its carrier, taking into account both security and usability concerns (cf. European Commission 2005: 46-74). The concept of "identity" itself rarely receives specific attention in this context, although it is present in the literature (cf. v. d. Ploeg 1999, Lyon 2008, Schouten et. al. 2012). However, these discussions tend to focus on

"social identities," e.g., racialized ascriptions of identity (Lyon 2008), or the social consequences of reducing "identity" to a biometric data set (Schouten et. al. 2012, cf. also Weiss 2011). Questions about the metaphysical status of personal identity and its ethical implications seem virtually absent from this discourse.

I do not mean to suggest that privacy, security, and usability concerns are unimportant. But I believe that we get a fuller ethical perspective on contemporary biometry, if we begin with a metaphysical perspective on personal identity. This perspective has so far been largely absent from the discussion. Metaphysicians rarely discuss the social and political implications of their views and social and political philosophers rarely pay attention to metaphysics. This paper takes a first step to close this gap.

I argue for the following three claims:

- Personal identity is not a physical or psychological fact, but a set of conventions.
- The combined use of identification documents and centralized databases such as birth certificates, tax registers, passports, etc. is arguably the most important "identity convention" today.
- The legal rules that govern this convention (e.g., rules regarding technical standards for passports or rules regarding the acceptability of so-called "breeder documents") should be subject to careful ethical scrutiny, since they can determine whether a person has an identity or not (which in turn determines her access to certain resources, and whether or not she will be able to enjoy certain rights and freedoms).

In the following section, I provide a very brief summary of the contemporary metaphysical debate about personal identity, drawing heavily on the work of Derek Parfit. In Section 3, I take issue with Parfit's claim that "identity is not what matters," suggesting that even if identity is a convention rather than a physical or psychological fact, it is a convention that is of the utmost importance to how we understand ourselves and our lives. In section 4, I apply this thought to the use of biometric technology as a means of inclusion and exclusion in an international context. I suggest that the distinction between a person's *true identity* and its *representation* rests on a mistake. In the political, legal, and social context of contemporary biometry, e-Passports are not a representation of someone's identity: they *become* that person's identity. This should lead us to carefully consider the conventions that regulate the use of e-passports, particularly the above-mentioned racialized ascriptions of social identity, and exclusion from standardized ways of "proving" one's identity, e.g., if one happens to be the citizen of a country that does not provide passports with biometric data.

2. Personal Identity and Metaphysics

What makes a person the same person over time? At first glance, the metaphysical problem of personal identity seems to be no problem at all. Identity is simply "that relation that everything bears to itself and no other thing." (Lewis 1983: 57) And thus personal identity must be the relation which a person has only to herself and no other entity. But this definition is circular, and it remains silent on the crucial question of what it is essentially to be a person (cf. Shoemaker 1998, Noonan 2011).

The metaphysical problem of personal identity is the problem of finding plausible criteria for the persistence (some say survival)[1] of persons and personhood over time. The criteria that have been proposed for personhood and the persistence of persons fall into two large groups: substantial and relational. In both groups we find material and immaterial versions of these criteria, so that we get four basic views:

1. Persons are immaterial substances, i.e., souls.
2. Persons are material substances, i.e., bodies or parts of bodies.

[1] David Lewis (1983) and Derek Parfit (1984) framed questions of personal identity in terms of survival.

3. Persons are overlapping chains of physical states and events, i.e. personhood is the continuous existence of bodies or parts of bodies.
4. Persons are overlapping chains of mental states and events, i.e. personhood is psychological connectedness and continuity.

While we have good reasons to regard a combination of 3) and 4) as more plausible than either 1) or 2), views 3) and 4) actually only support skeptical conclusions about personal identity. The view 1), that persons are their souls, has fallen out of fashion in philosophy (but see Swinburne 1998). And even if souls were the essence of personhood and personal identity, this would be irrelevant for our common and advanced identification and authentication practices, since souls cannot be observed, quantified, or otherwise be converted into usable data.

The view 2), that persons are their bodies, resonates with our common ways of identifying and re-identifying people. We recognize them by their salient physical features: their facial features, their voice, their gait. The biometric industry has expanded these common ways and added new features: iris patterns, fingerprints, DNA.[2] But this is not something radically new or different. It is a technological enhancement of existing epistemological strategies.

One obvious challenge to these epistemological strategies is that human bodies undergo numerous and often drastic changes during their lifetime. They grow and they age. Features and entire body parts can be added and lost: one could get a tattoo but have one's freckles removed via laser surgery. An arm may have to be amputated, an internal organ can be replaced, or a leg prosthetic attached. And yet through all these changes "there [is] no question about the same person, though the limb which but now were a part of it, be cut off." (Locke, Essay, II.27.11).[3]

The limits of currently feasible biometric identification and authentication systems are well-documented. The 2005 report *Biometrics at the Frontiers*, delivered to the European Commission, contains four "scenario exercises" which illustrate the different tradeoffs between security and accuracy on the one hand, and convenience on the other (101-114). These "scenario exercises" seem to suggest that we could in principle increase the security and accuracy of identification and authentication systems indefinitely, if we did not have to pay attention to tradeoffs in terms of profitability and social acceptability.[4] But tradeoffs are not the only issue here. The biometric identifiers we are currently able to use are not in fact representations of personal identity. They are merely stand-ins for personal identity, established by convention. To see why this is so, let us turn to more plausible criteria of personal identity, the basic views 3) and 4).

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[2] Instead of "DNA," I should probably say "that sequence of so-called 'junk' DNA which is commonly used for identification purposes.' But for the sake of readability, I will use the less precise expression in the text.

[3] We could even imagine, in the spirit of the famous "Ship of Theseus" thought experiment, that by coincidence, all and only the molecules that now compose your friend end up composing a stranger. If what mattered for the continuous existence of a body were the continuous existence of its parts, and if personal identity were no more than the continuous existence of the same body, then the right answer in this case would have to be that the stranger is now your friend. But this is obviously the *wrong* answer. Your friend remains your friend, even if all the molecules in their body change, and the stranger remains a stranger, even if all the molecules that were previously in your friend's body now compose theirs. The particular units of matter which compose our bodies are too flexible and too replaceable to be a good criterion for personal identity. But we could circumvent this problem by using *features* of bodies that do not change, or do not change significantly. The science and industry of human biometrics has exactly this purpose. It develops and sells identification and authentication systems which use some features of human bodies (or a combination of features) to identify or re-identify the person who "inhabits" the body. In this regard, contemporary human biometrics is just an extension of our ordinary ways of identifying and re-identifying persons. And just like these ordinary ways, biometrics can fail.

[4] For instance, it would unprofitable to equip a student cafeteria with state-of-the-art fingerprint scanners, since the cost of these scanners far outweighs the expected losses if some unauthorized persons eat subsidized food there (European Commission 2005, 24). Similarly, a move to introduce routine DNA-screening at airports would, despite the arguable gain in security, likely fail due to lack of social acceptability and prohibitive waiting times (European Commission 2005, 70-71).

John Locke developed the first comprehensive relational account of personal identity. He believed that consciousness was the mark of personhood, and that the persistence of conscious existence was the correct criterion of personal identity. Locke rejected substantial criteria of personal identity,[5] and argued that we are the same persons as far as our memory stretches back into the past (Essay, II.27.10). Locke's "Memory Theory" remains the most influential model for contemporary defenses of the view that personal identity is essentially continuity of consciousness, even where its defenders admit that "plainly the simple Lockean theory must be revised." (Shoemaker 1998: 303)

Locke's Memory Theory suffers from two major defects, already noted by his early critics Thomas Reid and Joseph Butler.[6] First, personal identity is a transitive relation while "psychological connectedness" through memory is not.[7] Second, Locke's account is circular: labeling a memory as "mine" seems to require that I already have a concept of identity that allows me to ascribe particular mental events to particular persons.[8] Derek Parfit and David Lewis have suggested that the simple Memory Theory should be amended with a transitive criterion of *psychological continuity*, which they dubbed *Relation R*. Relation R refers to overlapping chains of psychological connections, and it thus evades the transitivity problem. It does give us what I take to be to be the most plausible criterion for the continued existence of persons, namely the continued existence of their mental life. But it does this at the cost of making identity seem like a shallow and irrelevant category.

With a number of science-fiction examples, among them teleportation, Parfit aims to show that "identity is not what matters." (1984: 245-280, 1995) Psychological continuity can hold between more than two persons: If the teleporter accidentally creates a second copy of me, then both copies will be R-related to the original who entered the teleporter, but at most one one of them can be identical with it (and probably neither is).

Whether I am R-related to a future or a past person depends only on *intrinsic properties* of my relation with them, for instance on whether enough of my brain survives so that there can be overlapping memory chains between us. Whether I am *identical* with a future or past person can sometimes depend on a property that is *extrinsic* to the relation between me and them. The teleportation case illustrates this: Whether the copy of me is identical with the original depends on whether the teleporter accidentally produced another copy, a fact which has no bearing on the R-relatedness of either copy with the original.

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[5] Locke illustrated this position with the thought experiment of "the soul of a prince, carrying with it the consciousness of the prince's life, enter[ing] and inform[ing] the body of a cobbler." (Essay II.27.15). He thought it obvious that the prince continued to exist in the cobbler's body. There are numerous examples from contemporary science-fiction which play on the idea that one person (consciousness) can "jump" between bodies.

[6] Thomas Reid pointed out that memory, unlike identity, is an intransitive relation. He used the example of the "brave officer," who remembers a childhood event as a young soldier, and remembers being a young soldier as an old general, but as an old general, has forgotten the childhood event. Locke's Memory Theory would in this case yield the contradictory result that the old general is and is not the same person as the child who later became a soldier (Reid, Essays III.6). Joseph Butler noted the circularity of Locke's Memory Theory (that it presupposes identity rather than being a criterion for it) and called it his "wonderful mistake" (Butler, Dissertation I: 329).

[7] I am taking the term "psychological connectedness" from Parfit (1984).

[8] Defenders of the Lockean theory have tried to address this problem by distinguishing between memories and quasi-memories (cf. Shoemaker 1998). Quasi-memories are, roughly, mental states that have all the qualities of memories, except that the person who has them need not be identical to the person who experienced them. Only in cases in which there is an "appropriate causal relation" between the event and the memory of the event will the quasi-memory also be a memory, and only then will we say that the person who remembers the event is identical to the person who experienced it. But the idea that "real memories" must be "appropriately connected" to the events they represent begs the question: It presupposes that the person who remembers experiencing X must be identical with the person who experienced X. We have used the concept of identity in order to distinguish "real memories" from "fake memories": and then used this distinction to show what identity consists in.

Parfit takes the (potential) dependence of identity on extrinsic factors as a reason to think that identity *is not what matters* and that we ought to take it less seriously (1984: 245-280, 1995). He suggests that Relation R contains everything that matters, and that it could be consoling and liberating to adopt this view (Parfit 1984: 281). I disagree with him on both counts, and will briefly discuss and defend the view that Relation R does not contain everything that matters in ordinary personhood, and that sometimes what matters in ordinary personhood does depend on extrinsic factors (such as, for instance, the possession of a passport).

3. Extrinsic Properties and Identity

It may be true that the view that identity is not what matters can give us solace. It could be liberating to think of death not as an absolute end, but as just the end of more immediate connections between experiences. Memories of our lives and our work could live on in others, and influence them, and this may give us hope when, for instance, we face a terminal illness (Parfit 1984: 281). I think that Parfit is right about this positive effect of embracing Relation R in this context. But he seems to ignore cases in which embracing Relation R amounts to ignoring assaults on identity. To return to the example of teleportation: If I learn that a teleporter has accidentally produced another copy of me, I may be pleasantly surprised (cf. Parfit 1984: 199-201), but only if I can be on good terms with my *doppelgänger*.

Identity theft is a crime and a risk of which developers of new identification and authentication technologies are acutely aware. The use of PIN-codes, special "security questions," and biometric features in authentication documents is supposed to prevent identity theft, even when someone manages to obtain these documents illegally. Now let us imagine that my evil *doppelgänger* has not just stolen these documents (passport, credit card, health insurance card, birth certificate) but also found ways to crack their security features and to mimic the biometric data that allow her to pass as me.

In such a case, I have

- good reasons to regard this as a genuine loss of my identity, since I could be left without any opportunity to prove to authorities, employers, banks, and even friends and family that I am still the same person.
- good reasons to react to this loss with moral outrage.

If an identity thief targets my assets and my social life, this is anything but trivial, even if the attack which causes the loss of identity is, from my own vantage point, extrinsic to the relation between present and past versions of myself. We could perhaps say that "identity theft" is just shorthand for "theft of representations of my identity," for all that changes is how other people see me. But if I have no way of rectifying the theft, then the fact that I still have the same memories and the same body and brain matters little. In all other contexts except the "intrinsic" one, I have ceased to exist. And this is something that matters deeply.

The loss of identity in the case of identity theft is a change of convention. If the theft is successful, what changes is how the thief will be addressed (i.e., her name, her status, her employment) and accordingly, how I will be addressed. The use of names, behavior relating to social status, and the like, are conventions. Thus, if successful identity theft results in a genuine loss of identity, this suggests that identity is a convention and sometimes dependent on extrinsic factors, such as whether I am in possession of proper documents.

Insofar as political and legal authorities are concerned, identity begins when the name, date of birth, and the names of the parents of a newborn baby are entered in the population registry, and a birth certificate is issued. Identity ends when a death certificate is issued. All identity documents a person might obtain during the time of her life, from an e-passport to a keycard which allows her to access an office building on weekends, are dependent on her prior registration. For instance, in order to apply for a passport, she will need to show proof of identity, often in the form of a birth certificate. Note that the "proof" in this case is itself another document, or an entry in a database.

In modern states, personal identity is a chain of bureaucratic events. One missing link in this chain can amount to a missing identity. Consider the case of Benjaman Kyle (Forsyth 2010). Kyle was found unconscious behind a fast-food restaurant in Georgia in 2004. He suffers from amnesia and cannot remember his name (he adopted the name Benjaman Kyle after he was found) and has only a few vague recollections from his previous life. When Kyle was found, he had no documents on him, and he cannot remember his social security number. If he could remember this number, it would allow authorities to find his "real name" and piece together his previous history. As it stands, however, Kyle is listed as a missing person, even though his whereabouts are known.

What makes Kyle's case interesting for the discussion at hand are the assumptions that underlie the reactions to his case. If we apply Derek Parfit's reasoning to this case, we could say that Kyle has lost virtually all R-relatedness to the person who once "inhabited" the body with which his present body is continuous. If this loss is irrevocable, Parfit would presumably recommend that Kyle should be regarded as a new person and be issued a new social security number, new documents, and so on. However, what actually happened was a hunt for clues about Kyle's past: If it were possible to find witnesses of his former life, or if it were possible for Kyle to remember his full social security number, he could be *given his identity back.*

Kyle's case seems extraordinary, but it may be more common than we think: Like Kyle, refugees without any kind of identification documents are effectively treated as non-persons, as people who do not have an identity (v. d. Ploeg 1999: 297). Unlike Kyle, they can claim a name and an origin, but these claims will usually be subject to intense skepticism and questioning by the border guards and officials who assess their stories. As David Lyon (2008: 500) puts it: "Telling your story no longer suffices. It is displaying your card that counts."

How population registries, birth certificates, social security numbers, and passports (with all the legal rules which stipulate their proper format and use) establish and deny identities might seem distinctly modern. And thus one could object to the view offered here that this modern, bureaucratic understanding of identity has merely usurped the traditional ways. This is perhaps true, but it is no argument against a "conventionalist" understanding of identity. If the traditional ways were indeed ways of "telling stories," of supplying envoys with royal letters of introduction, or of conveying lineage by adding a matro- or patronymic to a name,[9] then they were no less based on convention than the modern ways. The crucial difference between the two is that the modern ways are more strictly regulated by legal means, and that today they can use the science of biometry to give them an appearance of objectivity.

In his short essay "Identity and Identities," Bernard Williams warns that "[c]onventionalism about identity is very tempting [but it] does not come cheap." (2007: 61, see also Williams 1970) Conventionalism appears to emphasize externalism at the expense of plausible internalism: Our self-understanding becomes less relevant than the roles we are assigned by others.[10] After an identity theft, I do not feel any differently about myself, rather I feel wronged by the thief. So how can we justify saying that my identity was lost through a mere change in conventions? Or alternatively, that an identity theft seems to be mere lack of respect for convention?

Williams appears to worry that conventionalism makes identity less meaningful. But the opposite may be true. Parfit-style skepticism (which Williams rejects) opens up the possibility to investigate the juncture of personal and social, numerical and qualitative identity. But neither Parfit nor Williams take

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[9] Patronymics were widely used in all parts of Europe until the 19th and sometimes into the 20th century. Today, patronymics and occasionally matronymics are still in use in many Slavic-language countries (where they form a "middle name" between name and surname), and in Iceland (where patronymics and matronymics are legal surnames). Surnames that have their roots in patronymics are still ubiquitous in the Scandinavian countries, the Netherlands, and to a lesser extent in Spain and Portugal.

[10] One the one hand, "identity conventions" may seem arbitrary and thus not strong enough to carry all the conceptual weight we tend to put into identity and selfhood. On the other hand, it may seem as if identity (as individuality) is lost if we proclaim that it no more than convention. I think both worries are justified, but neither actually takes into account the extent to which identity is constituted in social processes, and that these processes are not simply a form of self-discovery (cf. Taylor 1994).

this step.[11] Discussions of social identity are strangely absent from the contemporary metaphysics of personal identity, and vice versa.

Many of the things that mark us as unique persons, things others can use to identify and re-identify us, are quite obviously constituted in dialogue, between parents and children, teachers and students, and the law and the citizens (cf. Taylor 1994). These dialogues have a profound effect on the way we view ourselves, and they bear significant potential for harm.[12] If our identity is constituted in a web of legal documents, naming conventions, ethnic and religious identifications, and biological features, we should subject the rules that structure this "web" to careful scrutiny.

Saying that identity is a convention does not imply that we do not have any moral tools for criticizing callous disregard for these conventions (such as identity theft). But neither does it imply that any and all identity conventions are immune to criticism. With regard to biometric identification and authentication practices, I propose that we pay special attention to how biometry serves as a tool of exclusion.

4. Biometry and Exclusion

Using biometric data for purposes of authentication and identification requires agreement on rules regarding

- which biometric data sets count as acceptable means of identification
- how these data sets shall be collected, and under which circumstances travel documents that contain or reference these data sets shall be issued

These "agreements" and "rules" belong to the types of conventions I have highlighted in the previous section. They are conventions that stipulate when a person counts as self-identical in the eyes of legal authorities. Both kinds of rules present particular challenges. In the first case, the challenge is to find data sets which are convenient to use for everyday purposes and yet difficult to steal and copy. The ethical challenge here is mainly to protect privacy rights.

In the second case, the challenge is directly related to identity. For technology developers, this challenge has become known as the problem of "breeder documents" (cf. European Commission 2005: 42-43). "Breeder documents" are the documents which are required to apply for a biometric passport, e.g., birth certificates. No matter how far we can increase the safety and reliability of storing and using biometric data on a passport, the passport itself will only be as "safe" and "reliable" as the bureaucratic process through which it was issued. For instance, if a state's birth certificates were relatively easy to fake, and this state required only birth certificates as a condition for issuing a passport, then as a consequence, the state's passports would become unreliable identification documents.

Implementing effective international standards for biometric travel documents requires agreement on the issuance conditions of such documents. From the perspective of states whose legal requirements for the issuance of passports and other international travel documents are relatively demanding, universally enforced, and based on reliable breeder documents, a call for high international standards in breeder documents will seem like a reasonable demand for border security. If such a state cannot be sure that a biometric passport (even if it is up to the latest technical standards) was issued through a trustworthy process, then it has little reason to trust its bearer.

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[11] Consider an analogy with legal philosophy: Suppose I become convinced that natural law, a set of universal and eternal moral principles, does not exist. That does not mean that I should become a relativist about the justifiability of actual legal practices. Yet Parfit employs this strategy of "throwing the baby out with bathwater" when it comes to identity: finding that personal identity lacks a firm footing in "intrinsic," metaphysical factors, he concludes that we should reject the concept altogether.

[12] One reason why it is an insult to insist on referring to a trans*person by anything other than their chosen gender and their chosen name is the implicit judgment that one's own gendering and naming convention deserve more respect than another person's wishes.

But consider the problem of "breeder documents" from the perspective of a citizen of a state that does not have a "trustworthy" bureaucracy. If her state does not keep proper records of its citizens, or if its passport does no fulfill the latest technical requirements demanded by the most advanced states, or if its passport issuance process is not transparent enough, she will either be effectively excluded from international travel, or at least regarded with increased suspicion and hostility.

One of the extreme examples for this is Somalia: Somalia has not had an effective national government for decades, and as a result, very few Somalians are in possession of any kind of "trustworthy" identification. For most Somalians, the only way to leave Somalia is as a refugee, or as an irregular migrant. While Somalia is an extreme example, it is not an exception. Regarding documents proving family status, Germany, for instance, lists over forty countries as "suspect." This means that refugees and migrants from these countries, trying to be reunited with their families will have to "prove" their origin in other ways than with such documents (Weiss 2011: 8, cf. also v. d. Ploeg 1999).

The fault line between "trustworthy" and "untrustworthy" countries seems to mirror the divide between affluent and poor countries. But when it comes to "breeder documents," even affluent countries have intransparent and inefficient standards and formats. The United States, one of the global forces pushing for more and more security measures in international travel, is reported to have *fourteen thousand* different formats for birth certificates currently in use (Sprague 2010). (But the United States is arguably in a much better position to introduce consistent standards for "breeder documents" than states that lack a properly functioning bureaucratic infrastructure.)

If affluent states unilaterally agree on using biometric data and highly reliable breeder documents as a precondition for unrestricted or largely unrestricted freedom of movement between themselves there will inevitably be a tradeoff for citizens of states that cannot follow the pace of these initiatives. What on the "inside" (the EU, the US, and a few other countries) is touted as progress in the security and convenience of international travel, is from the "outside" another means of exclusion against the global poor and non-white populations (cf. v. d. Ploeg 2005). Thus I see two major ethical concerns with these kinds of initiatives:

- Biometric technology has become cheaper and cheaper, a trend which will likely continue. Nevertheless, for poorer states, the costs of "updating" their bureaucracy to use the newest technology and enforcing high standards for its breeder documents could be prohibitive (cf. European Commission 2005: 44-45). Even if such states successfully implement such "updates," they may have to forward some of these costs to their citizens, which could make it prohibitively expensive for them to obtain appropriate travel documents.
- The implementation of biometric criteria may amplify racist prejudices in border control and travel security settings.

I take it that concern 1) is quite self-explanatory. Concern 2) requires us to very briefly consider the history and context of contemporary biometry. Biometry found its first widespread application in colonial regimes of the 19th century, e.g., the British rule over India. Its origins lay in the attempts of white elites to control non-white populations which far outnumbered them, and to the whites seemed indistinguishable (cf. Lyon 2008: 505). Today, the advantages of biometric technologies are invoked in a context in which mostly white, affluent states claim that they need to protect themselves against the anonymous threat of terrorism (and, perhaps to a lesser extent, against the "economic threat" of irregular migration). In the public imagination, both of these threats are closely connected to non-white, non-Christian populations trying to infiltrate "the West" from the outside.[13]

Narratives of a "Muslim threat," of global terrorism, and of uncontrollable masses of "economic migrants" stigmatize not just individuals but entire groups of travelers and migrants. At the same time, these narratives promote, either implicitly or explicitly, the promise of biometry to offer failsafe security and identity management tools. Biometry thus continues to function as an instrument for

[13] Little attention is paid to the extent to which Muslim terrorist activity in "the West" is actually "homegrown," or to the comparatively much larger extent to which Muslim terrorist activity affects the Islamic world.

controlling seemingly indistinguishable "masses" (which for the most part still happen to be non-white and non-Christian).

The use of biometric technologies undoubtedly has beneficial potential in terms of border and travel security, in terms of bureaucratic efficiency, and in criminological terms (considering the advances that have been made possible in this field by DNA-analysis). But we must not lose sight of the intended and unintended side effects: How biometry can effectively deny an identity to people, how it can contribute to racist stigmatizations of entire populations, how it imposes further restrictions on the freedom of movement of those who, in a global context, are already disadvantaged. More generally, we should be wary of how biometry may impose disproportionate financial and personal costs on the global poor. These side effects occur at the intersection of personal and social, numerical and qualitative identity, and this is why I suggested that we pay more attention to this field in ethical evaluations of biometry.

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VALUE-BASED DESIGN – AN APPROPRIATE STRATEGY FOR DEVELOPING NEW TECHNOLOGIES

Hanne Pihl Bjerre

Abstract
In my forthcoming PhD dissertation, I plan to make a case for the view that the strategy of value-based design can be used to decrease dramatically the current tension between the values of privacy and national security. In this particular paper, which is an early version of a chapter in that dissertation, my main aim is to frame the discussion about how we can benefit from using the strategy of value-based design while developing new technologies which could involve conflicts between those two values. The dissertation will be theoretically grounded, throughout, on a value-based design perspective.

Keywords
Values, technologies, individual privacy, national security, ethics, applied ethics, value-based design, value-sensitive design, values in design.

1. Introduction

In my forthcoming PhD dissertation, I plan to make a case for the view that the strategy of value-based design can be used to decrease dramatically the current tension between the values of privacy and national security. In this particular paper, which is an early version of a chapter in that dissertation, my main aim is to frame the discussion about how we can benefit from using the strategy of value-based design while developing new technologies which could involve conflicts between those two values. The dissertation will be theoretically grounded, throughout, on a value-based design perspective.

In Section 2 below, I discuss the concept of a value and what counts as a value in general. In that same section, I also discuss the two values of privacy and security. In Section 3, I explain what value-based design is and also discuss two different approaches to value-based design: *values in* design (Nissenbaum, 2001) and v*alue-sensitive* design (Friedman, Kahn, & Borning, 2001). In Section 4, I explain how the strategy of value-based design can be related to the development of technologies, and I give some examples that show how the values of privacy and national security can be embedded in technologies. *Finally, I* summarize my main arguments in Section 5.

2. Defining the Concept of a Value

The term "value" belongs to the grammatical category of nouns. Nouns are used when we want to name something, for example, a person, an animal, a place, or an abstract idea. A value is not a physical object, so it is definitely not a person, an animal or a place, but it does seem to be an abstract idea. In addition, a value can be described as a collection or a set of similar or related entities that people treasure or appreciate. The two values that I will focus upon in my dissertation, privacy and national security, seem to fit the above-mentioned criteria, but are rather abstract at this point. By discussing privacy and security in more detail below, I hope to clarify these concepts.

2.1 The value *security*

National security is an important subset of security. Here, I will discuss the overall value *security*. (*National* security will be discussed in detail in a separate chapter of my dissertation.) As a value, security can be described as the ability to protect oneself from harm. Here, I think about protection

against harm in relation to, for instance, one's health, life, reputation, possessions, way of life, opportunities, and so forth.

Security can be categorized not only as a value, but also as a so-called "core value". A core value is, according to James Moor (1997, p. 29), a value that is found in all human cultures, and he describes such a value as one that must be present in all *sustainable* cultures. It is rather difficult, if not impossible, to imagine someone who does not treasure the value of security, expressed in some way. Moor does not claim that core values are necessarily distributed fairly in a given culture. Actually, most often they are not. But the values will always be present in some way. Examples of other core values are, according to Moor, life, happiness, freedom, knowledge, ability, and resources (1997, p. 29). It is my view that security protects the other core values, and that security is therefore the most important of the core values. This seems to be a very suitable way of thinking about a possible hierarchy of the core values. If we do not have security, it is difficult to uphold the other values. But it is still important to keep in mind that all values are interrelated and help or support each other.

2.2 The value *privacy*

The value of privacy has been debated for a long time. Privacy is most often perceived as having *instrumental* value. In other words, privacy enables us to get or protect other important things. In order to understand the concept of privacy better, Moor (1997, p. 30) argues that a distinction between *normative* and *natural* privacy is helpful. As the name indicates, natural privacy occurs when laws of nature and physical circumstances provide privacy: for instance, the walls of a house, a closed door, trees in a dense forest, even the opaque paper of an envelope that is protecting the privacy of a letter inside of it. *Normative* privacy, on the other hand, is privacy provided by norms, which can be ethical, legal, or conventional.

Unlike security, privacy cannot be categorized as a core value. Privacy is not valued in every culture and therefore the value of privacy fails Moor's test for what can be considered a core value. Instead, privacy can be perceived as *an expression of the core value of security* (Moor, 1997, p. 29). Privacy supports security.

Privacy as an expression of security in a technology-related context can be exemplified by the use of passwords. Using passwords can be classified as a way of making a technology more secure and, moreover, as a way to gain and preserve privacy. A password helps a user to maintain security and privacy at the same time. For example, having an online email account without password protection would mean that anybody could access the mailbox owner's private mail. This is not a very secure way of storing information. The use of a password enables security. Also, using a password for online email preserves privacy because no one else can access personal information in the email. In other words, the owner of the email account is in control and access to the information contained in the email account is restricted.

Such a theory of privacy, in which the terms "control" and "restricted access" come into play, is James Moor's "control/restricted access" theory (Moor, 1997, p. 31). The basic idea of this theory is that we live in a highly computerized world, and it is impossible to control information about ourselves completely. Being able to *control* information about ourselves, it has been argued, is a fundamental definition of privacy. However, says Moor, we have to focus as well upon *limiting access* to our personal information. Not that controlling information about ourselves is irrelevant, but it is just not possible in today's complex society to do so completely.

2.3 Relating privacy and security

In many ways, we all benefit from security, including national security. But we need to make sure there is an appropriate balance between the values of privacy and security (including privacy and national security). Since technology plays such a central role in our everyday lives, it seems appropriate to reflect on how to ensure that new technologies are developed in a morally responsible way (Moor, 2005, p. 1). In the next section, I discuss this challenge and suggest a strategy called *value-based design*.

3. Value-Based Design

Ethical considerations published by professional philosophers have changed dramatically during the past century. Decades ago, such considerations typically took an analytical, meta-ethical approach, instead of applying ethical ideas to specific cases in order to reach ethical judgments. Later, professional philosophers became more interested in *applied ethics* (Hoven, 2007, pp. 70-72) in which normative theories are applied to specific situations to determine how we ought to act in such situations. Popular and well-known normative ethical theories that can be used in this way are utilitarianism, deontologism, and virtue ethics. These theories provide us with diverse perspectives on any given ethical question. Each theory claims to be able to tell us how to act in a given situation. Sometimes, the theories provide ambiguous answers. Nevertheless, the applied ethics method is still suitable in many situations; for example, when a technology is already developed and we are trying to understand the relevant ethical considerations afterwards.

This is an important point because the assumption on which my dissertation rests is this: whether or not we believe that ethical values are embodied or "embedded" in a given technology, such values will always be found there if you look for them. This makes it very important to reflect upon such values *before* the technology is created, not afterward. A fruitful way of addressing this need is a strategy called *value-based design*. There are two basic variations of this design strategy: the v*alues-in-design* strategy (Nissenbaum, 2001) and the *value-sensitive-design* strategy (Friedman, Kahn, & Borning, 2001). The general idea behind both of these approaches is that *values are inseparable from technology*.

According to the values-in-design viewpoint, technologies cannot be neutral in terms of values (Hoven, 2007, pp. 1-2). This implies that technology will embody values whether or not we intend them to do so (Nissenbaum, 2001, p. 119). The values embodied in a certain technology will influence people:

[…] technology is never neutral: certain design decisions enable or restrict the ways in which material objects may be used, and those decisions feed back into the myths and symbols we think are meaningful. (Nissenbaum & Gaboury).

Once technologies have been developed and put to use, it is difficult to go back to change the privacy-relate design and other values-related design embodied in them. A cornerstone of the values-in-design approach is to make sure that we focus: *"[…]* on values from the ground up, instead of retroactively." (Nissenbaum & Gaboury). In addition, Nissenbaum (2001) argues that, since technologies embody values, we have to move from values to the technology, which from my point of view seems very reasonable. Nissenbaum makes it clear that this values-in-design idea also includes people such as engineers and scientists. She writes:

Scientists and engineers can learn a different lesson […]: They must expand the set of criteria they would normally use to evaluate systems to incorporate social, ethical, and political criteria. (Nissenbaum, 2001, p. 118)

The second approach is value-sensitive-design, which is a methodology founded on theory. According to this approach, values can shape peoples' behavior and the social systems in which they participate. Besides taking values into account, value-sensitive-design also carefully considers things such as usability and personal preferences. The pertinent values in this approach include, for instance, welfare, justice, and human rights (Friedman & Kahn, 2007, p. 1186). Value-sensitive- design is a tripartite methodology. It consists of conceptual investigation, empirical investigation, and technical investigation, which are part of an iterative process.

Generally speaking, I do not think that determining the ethical aspects *after* a technology has been developed is the most suitable approach. The crucial considerations are the values that are embodied in technologies and how we develop those technologies. We need to reflect on this *before* we develop any new technology or a more advanced version of existing technology. Also, this includes leaving behind the often-used idea of applying normative ethical theories when a technology is put into use—*after* we developed it.

If we have the opportunity to consider the ethical aspects before the technology is developed, so much the better. Of course, we almost always have an opportunity to consider ethics before going forward. This is more a question of whether we are ready to spend some extra time and money before we continue with the development process. For example, it has been proven that it is very difficult to change the privacy settings for a technology after that technology has been developed and implemented. This is reflected in the following quotation, in which the values of privacy and national security are mentioned:

Privacy needs to be treated as a first-class requirement from the early onset in the design of an information system since, like for security and usability, it is extremely difficult if not impossible to 'retrofit' a completed system to make it more privacy-friendly. (Wang and Kobsa, 2008, p. 18).

Again, this suggests that, when developing new technologies, privacy and security issues must be given adequate consideration at the outset, a practice that Hoven (2007) calls "front-loading ethics" (p. 70). In his view, today we are experiencing a "design turn" (p. 71), where we acknowledge that ethical questions are already crucial in the research and design stages of new technologies. This "design turn" calls for an interdisciplinary approach, a close collaboration between computer engineering and the humanities that will guide corporate values throughout the design process (Nissenbaum, 2001, p. 120)

4. Examples of Value-Based Design

When thinking about embedding the value *equality* into a computer, the challenges of a blind or deaf person can serve as examples. A blind person cannot see the keyboard, which presents a challenge for hitting the right keys. Putting a marker that can be felt, such as a raised "bump", on two keys of the keyboard makes it much easier for a blind person to navigate the keyboard and therefore to be able to use a computer. Because of this very small change in the hardware, a blind person can type on a computer as easily as someone who is not blind. In this way, for the sake of persons who are blind, the value *equality* has been "embedded" in the hardware by making a very simple change in two keys. Similarly, a deaf person cannot hear when a computer sounds an alert. But by adjusting the software to add a visual alert message on the screen, the value *equality* can be embedded in a computer for the sake of persons who are deaf.

Turning, now, to the values *privacy* and *security*, with which my dissertation will be especially concerned, consider some additional examples. The value *privacy*, for instance, is embedded in software when a browser allows the user to turn "cookies" on or off. (A cookie is a small text file, stored by the browser, to remember the user's password, track the online movements of the user, and perform other tasks.) A user may not necessarily want to be tracked online, even though allowing tracking might have some advantages. A browser that enables the user to turn cookies off and on gives the user a way to maintain *privacy*. This also serves as an example of embedding the value *autonomy* (a centrally important kind of freedom) by giving the user the ability to make decisions — in particular, decisions regarding personal information about the user. A similar example is when a user is able to delete the browser history, which also embeds the values of *privacy* and *autonomy*.

Embedding *security* can be exemplified with a firewall. A firewall usually combines hardware and software to protect a computer and its user against harm from others. The main purpose of a firewall is preserving the user's security, and it is an obvious example of embedding that important value. Again, this can serve as an example of how privacy is an expression of security: a firewall providing security means that the user's privacy also will be protected.

5. Conclusion

As explained above, my completed dissertation will show that value-based design can be used to decrease conflict or tension between the values *privacy* and *national security*. In this preliminary paper, I have discussed the concept of a value, which I described as a collection or a set of similar or related entities and abilities which people treasure or appreciate. In addition, I described the values

security and *privacy*, and argued that security is a "core value" and that privacy is "an expression of that core value" (using terms from the writings of James Moor).

I also have recommended, here, that we use a value-based design strategy to make sure that the values that we consider important are embedded or embodied in technology from the beginning of a technology development project. Value-based design is a suitable theoretical strategy for doing exactly that — even in national security projects..

An important underlying assumption is that technology cannot be ethically neutral, even if we do not explicitly try to embed ethical values within it. This fact makes it even more important to carefully reflect on the ethical values that may become embodied in various technologies. We have to make sure that we proactively integrate ethical values into our plans for new technology. It has been shown, for example, by previous writers (Wang and Kobsa, 2008) that it can be very difficult or even impossible to retrofit a computer system to make it more privacy-friendly. Privacy, of course, is not the only relevant value, but it is serves as a good example, and it is one of the two central values that my dissertation will be focused upon.

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AN EMPIRICAL RESEARCH DESIGN FOR ANALYZING INFORMATION DIVERSITY IN TWITTER FOR DUTCH AND TURKISH USERS

Engin Bozdag and Qi Gao

Abstract

Information diversity has a long tradition in human history. Recently there have been claims that diversity is diminishing in information available in social networks. On the other hand, some studies suggest that diversity is actually quite high in social networks such as Twitter. However these studies only focus on the concept of source diversity and they only focus on American users. In this paper we analyze the value information diversity using theories from media studies. Later, we discuss the initial results of an empirical study where we analyze information diversity for Dutch and Turkish Twitter users.

Keywords

information diversity, information policy, filter bubble, cyber balkanization, value sensitive design, user modeling, personalization, diversity by design

1. Introduction

Social Information streams, status updates from social networking sites have emerged as a popular means of information awareness. Political discussions on these platforms are becoming an increasingly relevant source of political information, often used as a source of quotes for media outlets [8]. While most original reporting comes from traditional journalists, social publishing makes it increasingly possible to tap into breaking news. As some claim, "news no longer breaks, it tweets" [1]. It is often argued that the Internet, by promoting equal access to diverging preferences and opinions in society, actually increases information diversity.

Twitter allows fascinating information access, but also at the same time leads to information overload. In order to deal with information overload, a Twitter user will either have to decrease the number of incoming information (e.g. by limiting the number of people he follows) or by using a news recommendation algorithm that finds the most relevant information for the user. A news recommendation algorithm that is based on Twitter, has to make some choices to determine which news and which followees are relevant for the user. Thus, such algorithms will select some news, while filtering out some others. Personalization systems, ideally, help users to make choices after carefully weighing all the media content thrown at them and consume only the relevant ones. However, over-specialized systems can prevent serendipitous discoveries and being exposed to diverse viewpoints. As Pariser recently argued [17], overspecialized systems can put the user in a 'filter bubble', exposing the user to information that he only agrees with.

Providing people with only agreeable news items may have negative social consequences [15]. Group deliberation among like-minded people can create polarization; individuals may lead each other in the direction of error and falsehood, simply because of the limited argument pool and the operation of social influences. Increased polarization makes it more difficult for society to find common ground on important issues [20]. Research shows that 'confirmation bias' occurs when like-minded individuals form a group in order to make a decision [18]. When participants receive new information in a decision case after they have reached a preliminary conclusion, a clear preference was demonstrated for information supporting the preliminary group decision.

The question is, whether users are exposed to different, challenging viewpoints in social media such as Twitter. An et al. [1] have investigated source diversity for major news sources and observed that there is a high level of (indirect) source diversity for American Twitter users. According to Facebook's empirical study [2], online networks might actually increase the spread of novel

information by allowing information flows from our ”weak ties”. However, as we will show, diversity entails more than just source diversity and novel information is not necessarily diverse information. Are users mainly exposed to news from major news sources, or does the minority get a chance to reach a wider audience as well? Do users get to see different viewpoints? Can we observe the same pattern in different countries, for instance, in the European political landscape?

In order to find answers to these questions, we have designed an empirical study to research information diversity in Twitter. In this paper, we first perform a conceptual analysis of the value information diversity using theories from media studies and information law and policy. Later, based upon this theory, we present our research questions. Then, we show the initial results of our empirical study, where diversity is studied for Dutch and Turkish Twitter users.

2. Conceptualizing Information Diversity

Sometimes it is argued that technology is value-neutral, that is the technology is just a neutral means to an end which can be put to good or bad use. However, as van de Poel argues, technological artefacts do not simply fulfil their function but they also produce all kinds of valuable and harmful side-effects [26]. Van den Hoven argues that information technology is a constitutive technology, so that it shapes our discourses, practices and institutions and experiences in important ways [25]. Therefore, ethics should be involved in the design process, to open the black box of technology design and development, describe which choices have been made and can be made, preferably before the problem becomes manifest [25].

Value Sensitive Design (VSD) is an approach that aims to integrate values of ethical importance in a principled and comprehensive manner into the design of information technology [6]. It assumes that human values, norms, moral considerations can be imparted to things we make and use. VSD employs an integrative and iterative tripartite methodology, consisting of conceptual, empirical, and technical investigations. The conceptual investigation aims to create a working definition of the value. Conceptual analyses need to be informed by empirical investigations of the human context in which the technical artifact is situated. Technical investigations involve the proactive design of systems to support values identified in the conceptual investigation. VSD seeks to be proactive: to influence the design of technology early in and throughout the design process.

VSD holds that while the features or properties that people design into technologies more readily support certain values and hinder others, the technology’s actual use depends on the goals of the people interacting with it. It states that while there might be some values that are universal, a universal design is not feasible. How particular values play out in a particular culture at a particular point in time can vary considerably [4]. If we design for well-being, we need to account for the fact that people have different short and long-term goals. Therefore technology must avoid aggregating the well-being of people who have different, incompatible comprehensive goals or visions of the good life [27].

In this paper we apply Value Sensitive Design the following way: First, as a conceptual analysis, we introduce a normative framework to analyze the value diversity using theories from philosophy and media studies. Second, in order to perform the second step of Value Sensitive Design (empirical study), we translate the concept information into research questions. Finally we provide our research design which we will use to carry out the empirical research and investigate whether culture makes a difference in information diversity.

2.1 Dimensions of Information Diversity

Information diversity as an important value has a long tradition in human history. Socrates (470-490 BC) implicitly gave diversity a central role in his ’thesis antithesis synthesis’ dialectics of argumentation. The Socratic method is a form of inquiry between individuals with opposing viewpoints based on asking and answering questions to stimulate critical thinking and to illuminate ideas [9]. Similarly John Stuart Mill (1806-1873) argued that diversity is an important value in

his famous *On Liberty*. According to Mill, since mankind are imperfect there should be always be different opinions. Truth is then, is about "reconciling and combining of opposites" [14]. Diversity, exposure to diverse media content can help people to discover 'the difference'. From a liberal perspective, "pluralism, variety and conflict between differing views are commonly seen as fruitful and as being a necessary condition for human progress" [10].

Diversity of information, or media diversity, as the concept is often referred to in most democratic countries, is considered to be of crucial value and a central objective of communications and media policy. Diversity forms the basis for the popular 'marketplace of ideas' concept, in which different ideas and opinions are free to compete for the attention of users. Exposure to different ideas sharpen our wits and our ability to critically evaluate possible alternatives to out established wisdoms. Hence, only the best ideas prevail [7]. Societies exist for the benefit of their individual members and what is good is both various and only discoverable by the free expression of alternative goals and solutions to problems. The more the alternatives, the better the prospects for individual and collective welfare. From this viewpoint, the freedom of media, a multiplicity of opinions and the good of society are inextricably mixed. *Free Press theory*, a theory of media diversity, states that we establish and preserve conditions that provide many alternative voices, regardless of intrinsic merit or truth, find a hearing, provided that they emerge from those whom society is supposed to benefit its individual members and constituent groups [22].

In the US, the marketplace of ideas has been conceived by the courts and policymakers as a key dimension of First Amendment freedoms, in which citizens are free to choose from a wide range of ideas (content diversity), delivered from a wide range of sources (source diversity). The citizens then partake of this diversity (exposure diversity) to increase their knowledge, encounter opposing viewpoints, and become well-informed decision makers who are better capable of fulfilling their democratic responsibilities in a self-governing society [16]. Content diversity consists of diversity in format (program-type), demographic (in terms of racial, ethnic, and gender), and idea-viewpoint (of social, political and cultural perspectives). Source diversity consists of diversity in outlets (cables and channel owners) or program producers (content owners). There is an assumption that a greater diversity in sources will lead to a greater diversity of content. However, there is no empirical evidence supporting the existence of such a relationship [16]. Napoli argues that idea-viewpoint diversity is the most central to the marketplace of ideas metaphor and its relationship to effective democratic self-governance.

2.2 Two faces of diversity: reflection and openness

Often, media practitioners and politicians think that more media diversity is better. This, however, is not the case: media diversity always has to be externally gauged in some way or manner [22]. According to McQuail and van Cuilenburg [13, 22], gauging, or benchmarking, should be based on the existing social diversity that media are reporting on. To do this, McQuail and van Cuilenburg suggest two different normative frameworks. First, the media can adhere to the principle of *reflection* by proportionally reflecting differences in politics, religion, culture and social conditions in society in a more or less proportional way. Second, the media can adhere to *openness* by providing perfectly *equal access* to their channels for all people and all ideas in society, including the minorities. In reflective diversity the media try to reflect current market preferences andconsumer characteristics, whereas open diversity promotes uniform chances for divergent groups, movements and tendencies in society.

Karppinen also argues for openness: "the key task for media policy from the radical pluralist perspective is to support and enlarge the opportunities for structurally underprivileged actors and to create space for the critical voices and social perspectives excluded from the systematic structures of the market or state bureaucracy" [10]. Thus, if people are exposed to media outlets that are not necessarily diverse in themselves, but are traditionally underrepresented in people's media diet, this would increase information diversity [7].

3. Analyzing Reflective and Open Diversity in Twitter

In the previous section, we have shown two normative frameworks that can be used to measure diversity in traditional media: reflective and openness. These concepts need to be translated into design requirements before they can be applied and measured in social media. In this section we present an empirical study we performed using Twitter data. We present our experimental design, show how we translated diversity into research questions and share our initial results.

3.1 Experimental Design and Measuring Diversity

Over a period of more than three months we crawled microblogging data via the Twitter streaming API. We started from a seed set of Twitter users U_s, who mainly publish news-related tweets. The seed users were manually selected to cover different types of users including mainstream news media, journalists, individual bloggers and politicians. By monitoring the Twitter streams of U_s, we were able to add another set of users U_n, who actively interacted with users in U_s, to the crawler. To investigate the impact of cultural differences on the concepts of diversity for Twitter users, we repeated this data collection method for two countries, namely the Netherlands and Turkey. The Netherlands has the highest percentage of Internet access in the European Union and all newspapers, magazines, TV-stations and broadcasting organizations offer a wide range of websites with news, backgrounds, interactive platforms, audio and video [19]. To safeguard diversity, the Dutch Media Authority and the Dutch Competition Authority set strict requirements [23]. Turkey, on the other hand, is quite polarized in politics and no strict media diversity policies exist in this country [3].

3.2 Mapping Political Leaning of the Sources

We mapped the political leaning of Dutch seed users into five groups, left, centreleft, centre, centre-right and right. We did this using a number of public data [11, 21]. The political parties' stance in the landscape is determined by [12]. We mapped the Turkish media sources into seven groups: Kemalists, Islamists, Conservatives (moderate Islamists and economic liberals), ultra-nationalists, left (pro-Kurd, far-left), social liberals and center-right. For mapping the Turkish media sources, we used [3, 5].

3.3 Translating Diversity into Design and Research Questions

Table 1 shows how we translated different diversity concepts. First of all, media diversity measures whether seed users, users with many followees, link to each other (Also see Figure 1). The links they provide are important as they reach many users. Source diversity, frequently used by scholars in media studies, is defined as "Twitter user having a diverse set of followees". We measure this by comparing a categorized list of seed users (for instance those that belong to"left" category) by the total number of followed seed users (See Figure 2). As Figure 3 shows, reflective diversity is defined as user's exposure to a diverse viewpoints either through direct exposure (tweets) or indirect exposure (retweets). Open diversity is defined as the user's exposure to tweets coming from the minorities (Figure 4). Defining a source as "minority" is rather challenging. It can for instance be based on the number of followers a source has, thus if a source does not have many followers, it can be defined as a minority. It can also be defined by checking if the source in question is a political party and whether it does not have many seats in the parliament. The source could also be advocating the rights of a minority, for instance an ethnic minority. We have considered these aspects while defining "minority". One interesting question next to the mentioned diversity dimensions is user's own political bias (Figure 5). We want to learn whether the incoming information (tweets and retweets) influences what the user is sharing.

While translating these concepts into metrics, we use the following entropy formula used by van Cuilenburg [22] to measure traditional media diversity:

$(-\sum p_i \log_2 p_i) / \log_n$ (1)

"p_i" represents proportion of items of content type category i. "n" represents number of content type categories. For instance in reflective diversity, "p_i" represents incoming tweets from seed users with a specific political stance, while "n" represents all incoming tweets.

Table 1. Translating Diversity into Design Requirements

Type of Diversity	Research Question
1. Media Diversity	Do seed users with different political positions link to each
2. Source Diversity	Do users expose themselves to sources with different opinions in Twitter?
3. Reflective Diversity	Do users get directly or indirectly a diverse set of tweets?
4. Open Diversity	Do users receive tweets from minorities? Or are they also exposed (directly or indirectly) to minority viewpoints?
5. User's Political Bias	Do users post political messages whose political position reflects the political position of those messages that the users receive?

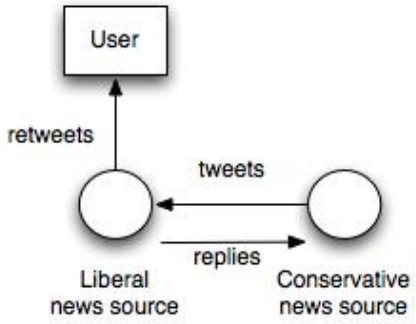

Figure 1. Media Diversity

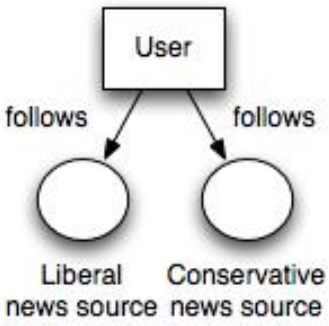

Figure 2. Source Diversity

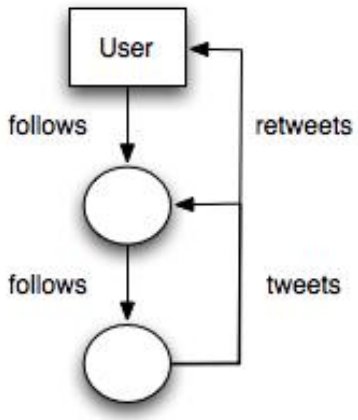

Figure 4. Reflective Diversity

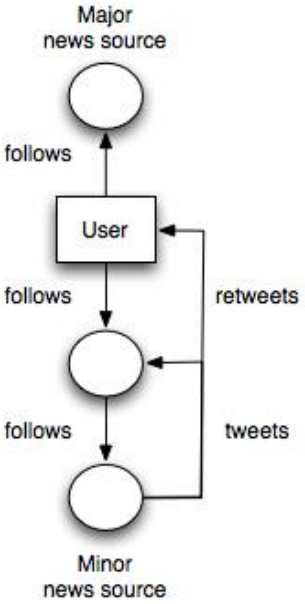

Figure 5. Open Diversity

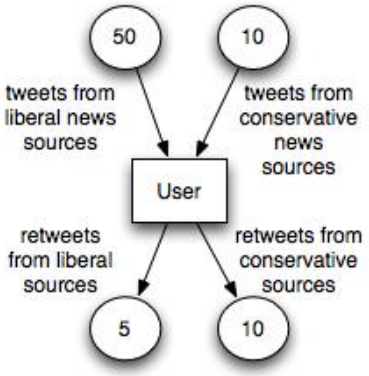

Figure 5. User's Political Bias

3.4 Initial Results

Figure 6 shows the distribution of seed users for the Netherlands. Out of 67071 published tweets, 36% is supplied by left users, 23% is supplied by right users, while 38% is supplied by center (right or left) users. Figure 7 on the other hand shows the distribution of seed users for Turkey. Out of 120395 published tweets, 33% is supplied by left users, 44% by right and 36% by center.

Tables 2 and 3 show the results for media diversity. We observe that seed users categorized as "left" mainly retweet and repost items of left seed users. 73% of all retweets and reposts go to left seed users. The same applies to "right" users (72%). We can observe the same pattern for the Turkish seed users as well, but the ratio is quite higher: 93% for left users and 94% for right users. This shows that our seed users, formed of traditional media sources, bloggers, politicians and political activists are not very diverse in "linking" to other sources.

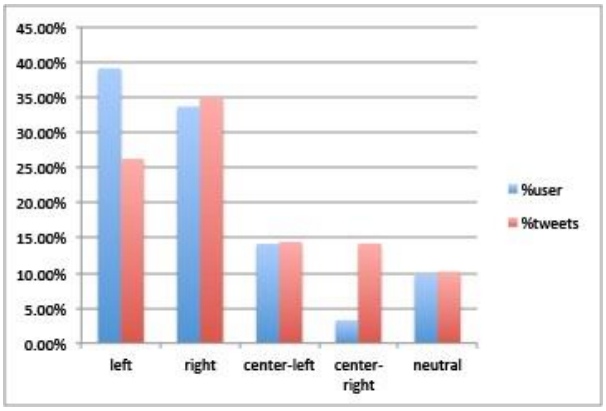

Figure 6. Dutch Twitter Seed Users

Table 2. Media Diversity for Dutch Users

	Left	Neutral	Right
Left	380	55	83
Neutra	30	30	11
Rightl	50	16	166

Table 3.Media Diversity for Turkish Users

	Left	Neutral	Right
Left	249	6	14
Neutra	2	1	0
Rightl	14	1	218

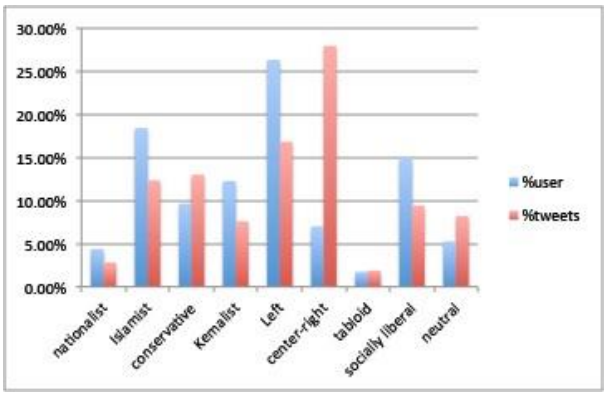

Figure 7. Turkish Twitter Seed Users

4. Conclusion

As we have shown, value diversity is more than just source diversity. The theory shows us that, in order to achieve diversity, the audience should be exposed to all voices, including those of the minority. In this paper we have shown initial results of our experiment, answering the first research questions (media diversity). We observe that seed users do not link to other end of political spectrum. We aim to answer our other research questions to understand whether reflective and open diversity exists in Twitter and whether they differ per country. This empirical study will complement our conceptual analysis. As a last step of VSD methodology and future work, we aim to investigate how diversity can be included in design.

While these questions will answer if information diversity naturally exists in a social network, it does not answer why. Future work includes a qualitative user study to understand whether users are aware of the diversity of their network, if they set up their network intentionally, and whether they can be persuaded to receive a more diverse set of information.

Acknowledgements

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TOWARDS A GOOD INFORMATION AND COMMUNICATION SOCIETY: BUILDING A TREE OF ACTIONS

Gunilla Bradley and Diane Whitehouse

Abstract

Information and communication technologies (ICT) are increasingly used in many areas of the globe. In terms of the information society, the challenges facing human beings are currently enormous. Policy-makers are often unable to handle such momentous decisions on their own. Citizens are therefore becoming increasingly involved in many realms of decision-making that are ICT-related. At ETHICOMP 2013, a panel of international experts will offer their insights into possible future directions towards a Good Information and Communication Society. The result will be a tree of actions, built together through discussion with the conference community.

Keywords

action, civic society, education, industry, good information and communication society, ICT society, research, stakeholders, values

1. Panel overview

Information and communication technologies (ICT) and media are being introduced and used in most parts of the globe. Sometimes development of these media progress by leaps and bounds and, at other times, at a steadier pace (Patrignani and Whitehouse, forthcoming). The current network society is experiencing considerable change and development (Castells, 2009), and has developed into what Al Gore terms the "Global Mind" (Gore, 2013).

These challenges are immense, and policy-makers on their own cannot handle these developments (European Parliament, 2012), as the 2007 Lisbon Treaty acknowledged with regard to the European Union (2007/C306/01). Acceptance and introduction of stakeholder approaches are becoming more commonplace, and are now included in planned international and national action programmes. Indeed, for example, the European citizens' initiative has been open for applications for over a year (The European Citizens' Initiative, 2011). The first action proposed by a group of citizens focuses on the human right to clean water and sanitation as essential human services (The Right to Water, 2012).

The panel proposers, Gunilla Bradley and Diane Whitehouse, consider that different components of civil society will be more and more involved in taking these kinds of citizens' actions than ever previously. Citizens are currently being encouraged to contribute positively to social change in their communities, and in the design and re-design of societal initiatives as well as their supporting technologies. There is, of course however, as some commentators have observed, arguably also the possibility that not all members of society will be keen to act as change agents.

To position their own insights into this work, Gunilla Bradley and Diane Whitehouse will draw on interviews they have undertaken on directions towards a good information and communication society with a select number of individuals worldwide during January-March 2013, and on their own exploratory work with students at Linnaeus University, Sweden, in April 2013.

1.1 Composition of the panel

The panel consists of around five different, internationally-based, ETHICOMP 2013 conference attendees. Selected ahead of the conference, they will be chosen as a result of their work in a diversity of fields, including policy-making, industry, research, education, and civil society.

It is anticipated that, while the focus may be on the European scene due to the conference location, the panellists may be resident in or work in very different parts of the globe e.g., the European Union (if possible, with a focus on Scandinavia), North America, Asia, and the emerging economies. They will explore concretely what could be the beginnings of more definitive actions to reach a Good Information and Communication Society.

The discussion will itself as far as possible incorporate the entire audience. It is currently foreseen that the list contributors may include, in alphabetic order:

Chair: Gunilla Bradley, KTH, Sweden

Panel participants: Don Gotterbarn, ACM, USA; Kiyoshi Murata, Meiji University, Japan; Jackie Phahlahmohlaka, CSIR, South Africa (TBC); and Diane Whitehouse, The Castlegate Consultancy, UK.

The availability of these persons to contribute to the panel is currently being explored. A period of pre-preparation undertaken with the panellists will ensure a solid discussion.

1.2 Panel content and outcomes

This panel session will investigate several different levels of change in the information and communication society: societal, national, local, institutional and organisational. It will include directions in values, lifestyles, individual cognition and behavioural modifications. On the one hand, it will focus on solution-building in terms of outlining tentatively what are desirable goals and actions to reach a Good Information and Communication Society. On the other hand, topics around how people can be motivated to participate, who does not participate in change-related activities, who is absent from such discussions, and what are the general implications of any such lack of participation for society, will also be included in the panellists' contributions.

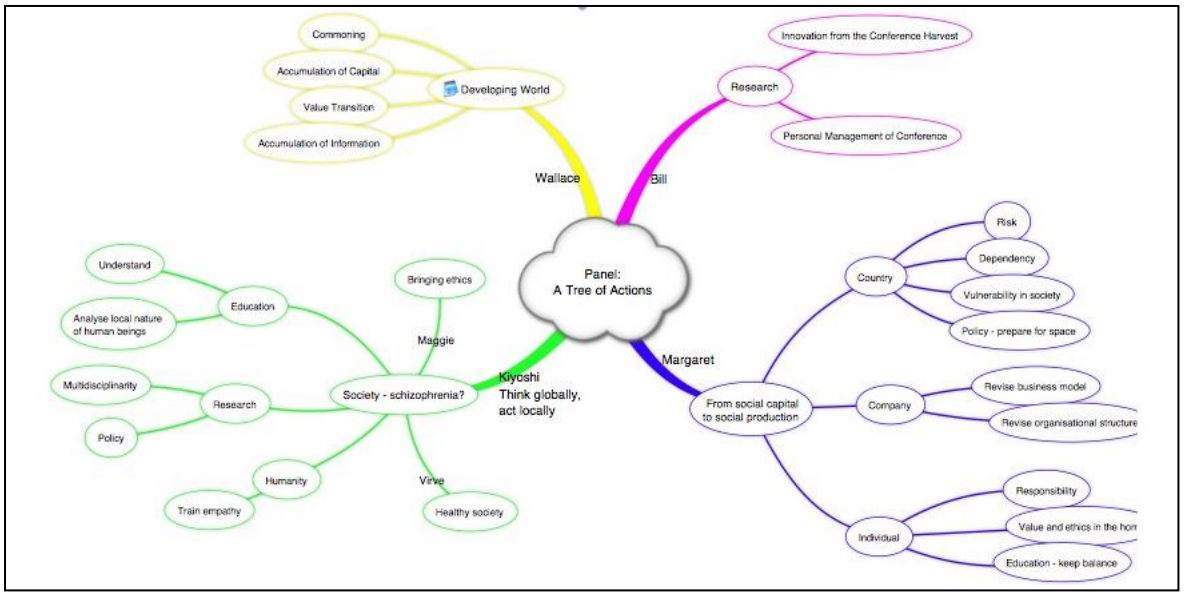

Figure 1. A mind map of a panel proposal for a tree of actions relating to the developing world, research, and social capital and social production - IADIS 2012, Lisbon, Portugal, 23 July 2012

Among the possible optimal goals for the network society to be covered will be: accountability, responsibility, involvement and empowerment. Several other possibilities will be placed in the spotlight: the bridging of the digital gap, democratisation, e-Cooperation, e-Democracy, freedom of expression, human rights, integration and humanisation, peace and sustainability, quality of life, and a reduction in poverty. There will also be coverage of some national/governmental actions and international levels and actions that are feasible at both the individual level and the community level, whether physical or virtual.

Emerging from the panel discussion will be an initial “tree of action(s)”, similar to a form of mind map. One such mind map was already developed following a discussion session held at the IADIS ICT, Society, and Human Beings conference in 2012 in Lisbon, Portugal in July 2012 (Bradley et al, 2012).

This kind of mindmap in Figure 1 will help to facilitate and stimulate creativity and encourage the sharing of “civic intelligence” (Schuler, 2012) among people who have quite different approaches to this broad field of foresight into the future of the information society.

The important elements of this discussion lie in a shared conversation that enhances growing shared communication around the kind of world which we want to live in together in the future. (Similar endeavours are taking place at the European level in contexts such as the Futurium http://ec.europa.eu/digital-agenda/futurium/ accessed 31 March 2013)

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A STATUS REPORT ON DANISH E-GOVERNMENT

Christian Bruhn

Abstract
Today, governments all over the world are implementing e-government. In Denmark, e-government has been provided to citizens by both the federal and municipal governments and the current legislative agenda has set the goal to digitize all communications with the public sector by 2015. In this paper, I will report on the status of the mandatory switch to digital communication as part of the Danish digitalization process.

Earlier studies Digital communication is a subject with ongoing research. The main contributor is the Danish government who, with a variety of departments, publishes reports and surveys, while Statistics Denmark also publishes an annual report on Citizens use of information and communication technologies (ICT) (DST, 2012). Additionally, Kim Norman Andersen from Aalborg University has recently written a status report on digitalization from a citizen's perspective, focusing on the process within municipalities. In contrast, I will focus on digitalization of the public sector in general. The reason for this change in focus is the fact that the municipalities are currently undergoing restructuring and selected tasks are being centralized in Udbetaling Denmark, a service unit owned by the state. Also, earlier research was uncoordinated and employed differing methods and measurements. However, with the introduction of Komhen 2.0, a standardized method to measure the progress of Danish e-government, data has become available and may now be compared with other, diverse sets of data.

1. Introduction

The aim of the digitalization process is to replace the existing analog communication channels that the public sector provides with digital communication channels. Within the EU, the definition of e-government is the use of ICTs in public administrations combined with organizational changes and new skills, while its objectives are to improve public services, democratic processes and public policies (European commission, 2005). As e-government is available 24/7 it has been argued that citizens will experience a higher level of service. Additionally, the quality of the services experienced will be homogeneous and digitalization will substantially reduce costs across the public sector.

With the introduction of the 2011-2015 strategy: "The digital path to future welfare" (The Danish Government, 2011) digital communication will become mandatory. The aim is to transition communication between the Danish administration and its citizens, and vice versa, to an entirely digital process by the year 2015. To facilitate the future use of digital solutions one suggested strategy has been to invest heavily in digitalizing elementary schools to ensure citizens are skilled in the use of ICTs as well as allowing for the adaptation of future digital solutions. However, this will take time and until then it will be possible, though difficult, to receive and exemption.[1] The possibility also exists that some citizens will find digital communication to difficult, thus finding alternative ways of communication and information gathering, for example by asking for help from their social networks. Yet others may simply ignore the need for communication with the government entirely, thus presenting a potential risk, as ignoring the communication may lead to citizens losing their public benefits or neglecting their civic obligations (Granovetter, 1973) (Wellman and Wortley, 1990) (Norris, 2001) (Mossberger, 2003) (Bruhn, 2009) (Giddens, 1990) (Putnam, 1995).

[1] The procedure for exempt is described in the perspective chapter

We may face the risk that groups within society neglect the official digital communication channels provided and adapt alternative ways to communicate with the government. This is not a problem initiated by digitalization but a challenge that digitalization has made evident.

2. Reading guide

In this paper I will present three different views on the digitalization process: Who is using digital solutions; Strategies used to implement e-government; and the potential of e-government.

- Who is using the digital solutions,
    - This chapter will be based on my earlier research, describing groups of the Danish population who are more likely to use the digital solution and descriptions of the methods of response citizens have developed in their communication with the public sector.
- Strategies used to implement e-government
    - With the implementation of mandatory digital communication by the year 2015, the Danish government has begun to employ a strategy strongly influent by the financial sectors home banking initiatives. I will discuss the differences in the two domains and argue why the method used by the financial sector to motivate their customer not will work in a public communication context involving citizens and the state.
- The potential of e-government
    - The digitalization process is a result of the digital age and as this technology is evolving and interfaces continue to change, the digitalization process the government is implementing now, by no means its final stage. Technology is changing our world and the way we live and this is just a little step on the way. To estimate the potential of digitalization I will present different statistics and use these to visualize the unfolding process.

Finally, I will discuss two ethical questions caused by the digitalization process. [2]

3. Who is (not) using the digital solutions?

Denmark is a welfare society where the government offers a wide variety of services to its citizens: Free public libraries, health care, public education, housing aid and social assistance, just to mention a few. These services are mainly offered to the most disadvantaged members of Danish society because of the constitutional right to financial support. The mandatory transition to digital communication will have diverse impacts on the different groups that compose Danish society. Firstly, the number of requests is dependent on the citizen's life situation. Compared to a high-income family or healthy citizens, citizens with low income or chronic diseases have a tendency towards a higher frequency of communication (LKS, 2005). Secondly, highly educated, healthy citizens have a stronger and wider social network that provides them with better services compared to those with low income (Wellman, 1990). Finally, persons with high income tend to have greater ICT skills[3] than low-income groups (Department for education and skills, 2003). Even though the segment of citizens with high-income has the best starting point for using digital communication channels, we cannot actually know if the individual citizens make use of them. They may use them, use them to some degree, or not engage with them at all. Earlier studies have shown that even highly skilled citizens who use the computer for

[2] As this article is about Denmark and the political ideology that formed the Danish welfare state, I advise the reader to seek out additional background knowledge on the Scandinavian welfare model. E.g. from the Scandinavian website: Norden.org.

[3] ICT skills are the combination of skills needed to operate and understand digital solution e.g. literacy and an understanding of society and the welfare system.

e-commerce will not necessarily use e-government solutions (Bruhn, 2009) (Mindlab, 2011). Additionally, my earlier research focusing on the tax system has shown that young people with greater skills in the use of ICTs also did not make use of e-government solutions. This was not due to lacking computer skills, but due to a lack of understanding regarding how the systems works within the government (Bruhn, 2009).

Other statistics have also shed light on the problems existence. Because of Denmark's relatively small geographical size, small population and high level of education, the proliferation of digital technology is widespread. The number and kinds of electronics owned by Danish households reveal an indication of digital readiness. This information is provided by Statistics Denmark in its annual survey on the proliferation of digital technology (**Error! Reference source not found.**).

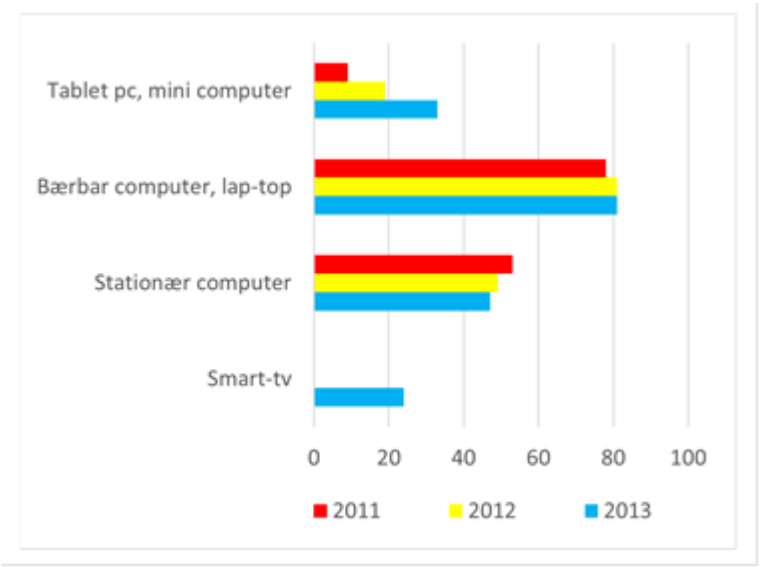

Figure 1

Nevertheless, even with a high level of proliferation there seem to be significant differences between the degree of digital readiness and the number and digital inquiries at local municipalities. For example in 2012, 86% of all Danish families had access to the Internet from their homes and 65% of the Danish population used the internet to buy theater or concert tickets (DST, 2012). Despite these facts only 13.8% of the inquiries experienced by the municipality of Copenhagen, including those made at public libraries, employed digital inquiries (Københavns Kommune, 2009).

The lack of *complete digital solutions*[4] could be one explanation for their absence as the quantity of *complete digital solutions* provided by Danish municipalities is limited. By November 2012, the only complete digital solutions provided to citizens where ordering a social security card, including the blue EU card, filing a notice of relocation and registering for daycare, after school centers or public schools. Other solutions provided by municipalities were only partly digitalized and typically, the initial communication employed digital means, but the processing was completed manually. At this point digital communication was not an option.

[4] The definition of a complete digital solution is a process that is completed without any human interference aside from the initiator.

4. The strategy

It is difficult to determent the exact start of the digitalization process, but it requires organization change. After the 2007 restructuring and decommissioning of the counties alongside the amalgamation of municipalities, the Danish public sector was reorganized into three levels (see **Error! Reference source not found.**):

- The state
- 5 regions
- 98 municipalities

These three sectors employ 761.000 people (DST 2012), which correlates to 35% of the Danish work force. In addition, another 64.000 are employed in various government enterprises. In fact, there has been a drop in public employees from 771.000 in 2010 to 748.000 in 2012, but these figures are still 20.300 positions higher than in 2007 (no data is available prior to 2007) (DST 2013, season corrected). If we expect that the digitalization process will result in a drop in public employees, we would have to bear in mind that many positions have transitioned from the public sector the government and private enterprises. These positions are not included in the statistics.

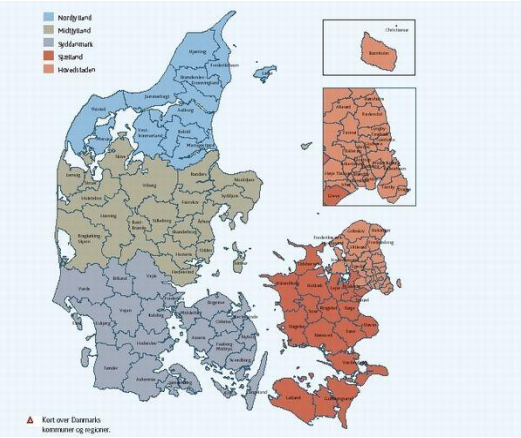

Figure 2

In 2012, Epinion completed an internet survey for the government to investigate citizen's experiences and trust in digital communication. The survey showed that 74% agreed that digital communication was an important way to save government funds. 69% though that digital communication was good for the environment and 69% were satisfied with digital communication. 81% agrees that accessibility to digital communication was an advantage when the internet was present. They argued that this would bring the Governments ambiguous 2015 plan within reach. Still it is my opinion that these numbers are low and bias existed in the construction of the question - who would not want to save on public expenses? In addition, it is remarkable that the survey was internet based. The outcome would likely be different if the survey was conducted via telephone- or paper- based survey.

The Danish government has to make a decision on how communication between the two parties involved, both citizen and government, is to take place. In order to make sure that citizens are capable of understanding the law and their obligations, the state has a duty to educate its citizens. The acknowledgment of this obligation can be seen in the government's 2011-2015 strategy: "The digital path to future welfare," where a decision was been made to invest heavily in the digitalization of elementary schools to assure the ICT skills of future generations. However, it is essential to decide when to implement new digital solutions. One can argue that the government must make sure citizens have acquired the necessary ICT skills before they implement mandatory e-government. On the other hand, if the government has to wait for each citizen to acquire the skills needed they risk an infinite wait. Therefor one can argue that it would be acceptable that a group of citizens, variable in size, who are not capable of using the digital solutions remained.

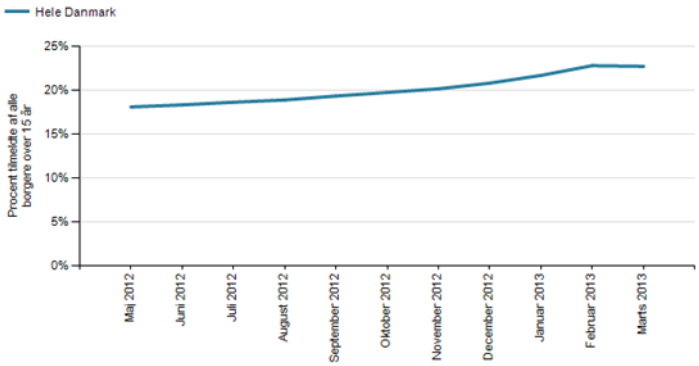

Figure 3

One part of the private sector in particular has proven that digitalization can be accomplished with a high level of participation - the financial sector. In 2011, 83 % of the Danish population used online banking (DST, 2011). The financial sectors success with digitalization is due to the fact that most banking is made up of relatively simple transactions, for example deposits, withdrawals and paying bills. Thus, the compulsory use of digital banking and the use of fees to guide the customers to make use of digital solutions have had a great effect. Over the past few years, banks closed their "nonprofit" departments and introduced a relatively high fee for paying bills or making deposits and withdrawals with a bank teller. By decreasing the accessibility and introducing new fees, the financial sector succeeded in creating a high level of digitalization. This confronted them with the fact that large groups of the population do not have the ICT skills necessary, or know how to use the digital communication channels provided. The financial sector responded to this by informing costumers that they could pay for the extra services if they were still available, or move to a bank that provided the required services.

In 2012, 92% of the Danish population between the ages of 16-74 years old had used the internet within the last three months (DST, 2012). However, the digital channels are not the citizens preferred method when it comes to communicating with the public sector. There is no clear indication why this is the case, but the quality and palette of digital solutions offered have been poor. Government research has shown that low accessibility, low quality digital solutions, as well as non-digital communication were the main barrier for making use of digital channels (Alsted Research, 2004; Videnskabsministeriet, 2005). Interview based research for 2010 revealed that citizens experienced communication with the government as difficult and problematic (Mind-lab, 2011), and as a result individual service were citizens preferred method. In the interviews, respondents indicated that the choice of individual service was purely due to convenience. In order to motivate citizens to use the digital solutions the Danish government could not employ the same methods as the financial sector by having citizens pay for personal service. Therefore, the Danish government made the decision that digital communication should become mandatory. With a focus on simplicity, quality and convenience, new digital, self-service solutions where implemented. Of course, these new solutions have had an impressive rise in use. In some municipalities, 92% of all reallocation messages were digital. But, if we look at how many Danish citizens have signed up for all the services provided by their e-boks.dk digital mailbox (see **Error! Reference source not found.**), only 23% had. In addition, approximately 1/3 of all Danish citizens used e-boks.dk but had not signed up for all e-boks.dk services.

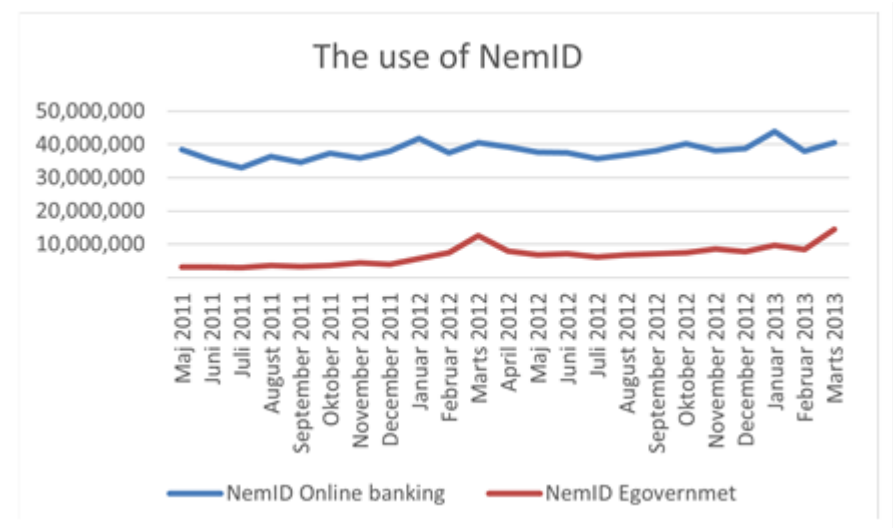

Figure 4

On the other hand, 46,7 % of families with children under the age of 6 had signed up for everything. It is unclear whether this significant percentage is because of increased digital communication with parents, or if it is due to young people's preference in using digital media (see **Error! Reference source not found.**).

There are no detailed statistics available on the use of internet banking, however, in Denmark all banks, pensions and e-government solutions make use of the same digital login, NemID. Therefore we can look at the number of logins using NemID. First, there is a significant increase in the use of NemID e-government reoccurring in March 2012 and 2013 correlating with annual tax returns. The number of NemID logins for online banking only increased by 5% from the fourth quarter of 2011 to the fourth quarter of 2012, while the use of NemID to make use of e-government solutions during in the same period increased by 101%. This doubling in the use of logins to e-government solutions is not an indication of the successful implementation of digital solutions, but only an indication that some analog services have closed down, for example notices of reallocation are only available as a digital service.

The Danish government has adapted the financial sectors strategy for implementing e-government. By decreasing, or even closing down, accessibility to individual service, the government has forced citizens to use digital self-service solutions. The government previously employed the same strategy when the department for tax closed its individual service locations as well. Today regional tax-centers have been closed to public access without prior arrangement, and call-centers have become the only option available to citizens to receive personal service. In addition, during peak periods call-centers are overloaded, resulting in increased wait times for citizens. There is no statistical information available on how many citizens eventually give up calling due to such overloads.

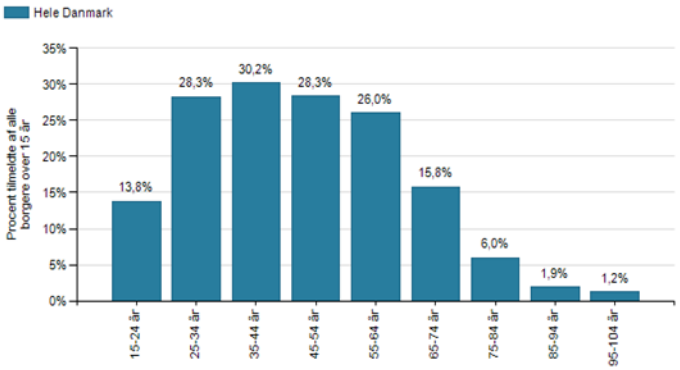

Figure 5

5. Discussion: Ethical dilemmas in the digitalization process

Here I will address two ethical problems of the digitalization process. The first of these is the lack of engagement in the digitalization process by the citizens themselves, if the digital self-service solution is the only option. The second problem is that the government has allowed for the possibility that family members or other members of the citizen's social network can be granted access to someone's digital identity.

There have been many discussions about the effects of the digitalization process. The main concern this has raised is that this process would split the population in two into those who make use of the digital technology and those who do not. As 92% of the population studied in 2013 had used the internet within the last three months (DST, 2013), this concern has not considered critical. However, as an 8% non-digital minority is still a problem, it raises the questions of how low can we expect the percentage of non-digital citizens to be, and what other analog channels do we have to keep open for this minority group?

There is a way to get exempt from digital communication. First, the public authorities must help you if you are having difficulties in making the mandatory switch to digital communication. Help will be accessible at libraries and local citizens-offices where educated help will be made available. No technical issues will be addressed. Secondly, it will be possible to either grant a family member or its equivalent access to your digital communication or apply for exemption. The rules for exemptions have not been decided but according to information on borger.dk there will only be 5 reasons to grant such an exemption:

1. You do not have access to a computer with internet from your home
2. You are disabled in such a way that you can't receive digital communications
3. You do not currently reside in Denmark
4. You have language difficulties
5. You have difficulties in gaining access to a digital signature (NemID)

It is believed that an exemption would last for two years and that citizens will be able to apply for the exemption at the Danish Citizens Service starting in November 2014 (Danish government, 2013).

One analog channel the government wants citizens to make use of in particular, is a person or relative who would be granted access to another citizen's digital signature. This person will then function as their gatekeeper and help the citizen with digital tasks. This however raises the question of what happens when the appointed gatekeeper makes a mistake? Would he be held liable and, if so, will it be a risk the gatekeeper would be willing to take?

With the potential to grant access to a personal digital signature to other persons, the government has tried to legalize a wide spread and common practice, particularly among spouses, where passwords are routinely shared (Bruhn, 2009). However, with digital signatures the possibility of detect fraud does not exists when people do not keep their passwords personal but share them in such a fashion.

With the possibility to grant other persons access to a digital identity, the government has outsourced tasks that it should really manage, to the family or close social networks of the citizens in question. Additionally, the issue of how many tasks the gatekeeper is capable of handling is raised.

This means that the citizens are caught in a dilemma. The more citizens employ digital solutions – the more digital-solutions will emerge. If they do not use the digital solutions - they will get financial restrictions. The financial restrictions come in the form of reduced accessibility, such as having to cross greater distances to reach points where the government provides the personal service needed, or making the communication so difficult and complicated that citizens give up.

Because we are currently in the vacuum between the analog and digital age, there will be a large segment of society who have never been educated in the use of ICTs as well as another who are autodidactic. Therefore, with the implementation of mandatory e-government, the resourceful and those with large social networks will continue to use digital solutions because they will be convenient for them.

6. Conclusion

The process of digitalization is a difficult one and it has just begun. Especially in the contexts of e-government it can be a challenge as many of the decisions are politically motivated. Danish citizens will not be left behind in the digitalization process. While this is primarily due to the Scandinavian welfare model, there are some issues in this process that we need to be aware of such as policies regarding exemptions from digital communication. As this process can be made difficult enough that citizens give up, alternative analog channels must continue to be as accessible as digital ones. Not only can the exemption process be seen as a barrier, the digital solution itself can be a barrier as citizens ignore digital communication as opposed to taking on the challenge. This is not due to a lack of IT skills, but because of shortcomings in understanding how, for example, the tax system works (Bruhn, 2009). Therefore it is an imperative task to educate citizens in the use of ICTs, as can be seen in the introduction of the 2011-2015 strategy: "The digital path to future welfare" (The Danish Government, 2011). But it will take at least a generation before this cultural change in digital preference will succeed.

It is also very important to implement standardized ways of measuring the digitalization process, as can be seen in the Komhen 2.0 standards. Alongside this, we also need to see if there is a change in usage patterns when an analog channel is digitalized to ensure that citizens are not ignoring their digital communications.

Finally, to report on the status of the Danish digitalization process, it is advancing, however it is important to monitor this process closely at all times. Citizens may develop alternative ways of solving their communications needs with the government and, in turn, the government needs to be aware of this. The digitalization process has created new challenges for both: the citizen and the government.

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ON THE ROLE OF ETHICS IN PERSUASIVE DESIGN

Sandra Burri Gram-Hansen and Lasse Burri Gram-Hansen

Abstract

In this paper, a selection of the current primary approaches to Persuasive Design are analysed and discussed in relation to two ongoing research projects. Based on experiences gained when applying persuasive design to more established research areas, it is suggested that current research within the field of Persuasive Design may benefit from a more nuanced and context oriented perspective. Persuasive Design researchers commonly acknowledge that successful persuasion is dependent on acting within an opportune moment, often referred to as the rhetorical notion of Kairos. Kairos constitutes the link between the opportune moment and the appropriate action and does as such also signify an ethical perspective. As a result this paper argues that a recurring ethical perspective throughout a design process may be a central to constituting the unique claim of persuasive design in relation to more established research areas such as learning and digital mediation of cultural heritage.

Keywords

Persuasive Design, Kairos, Ethics, learning, cultural heritage

1. The indeterminate concept of Persuasive Design

The common perception of technology has changed radically as users all over the world have progressed from digital immigrants to digital natives, and adapted to considering technology a natural element in our surroundings. Computers are no longer a specific type of data processing equipment used by researchers, they are now used by just about everyone for just about everything, and with the dawning age of ubiquitous computing laid before us, we rapidly approach an era where computers will be an unnoticeable part of our everyday life.

The many different aspects of HCI, and the implications that interacting with computers have upon our perception of the world, have already been researched from a variety of angles. Amongst these is the ability to use computers as persuaders, when wanting to change the attitude or behavior of the users.

The term Persuasive Design (PD) most often springs from work originally presented by Stanford University researcher, BJ Fogg, who in 1998 introduced the notion of Persuasive Technology (PT) and in 2003 published the first book on the subject in which he identified a number of ways in which computers may be considered superior to human persuaders [1]. By persuasive, Fogg proposes that computers hold a particularly strong potential to change the attitudes and behaviors of the users, but emphasises that the designer cannot rely on coercion or deception in influencing the user. Fogg defines a specific perspective on interactive computer technologies, which distinguishes itself from e.g. marketing technologies or technologies which somehow mislead the users.

Approaching the notion of computers as persuaders from a social psychology perspective, Fogg defines ‘The Functional Triad’, a categorized framework consisting of a number of design principles which through analysis of a variation of persuasive technologies where identified as common in persuasive technologies.

Figure 2.The Functional Triad as visualised by Fogg [1]

As shown in Figure 2, Fogg argues that a persuasive technology may function as a tool, a medium for simulation or as a social actor. For each of these roles Fogg lists a number of persuasive principles, which – through analysis of a large variety of persuasive technologies – he identifies as system design commonalities. These principles are listed in Table 3:

Table 3 - Overview of The Functional Triad, and the design principles defined in each category

Computer Role	Ability	Design Principles
Tool	Making target behaviour easier to do Leading people through a process Performing calculations or measurements that motivate	Reduction Tunnelling Tailoring Suggestion Self-monitoring Surveillance Conditioning
Medium	Allowing people to explore cause-and-effect relationships Providing people with vicarious experiences that motivate Helping people rehearse a behavior	Simulation
Social Actor	Rewarding people with positive feedback Modelling a target behaviour or attitude Providing social support	Social signals

The functional triad is originally described as a framework for evaluating and understanding the user's experience of applying a technology, and it is suggested that the simple task of understanding the psychological role of the technology may benefit researchers as they explore the notion of persuasive technologies further. Moreover, the functional triad is argued to be of value to designers who seek to develop persuasive technologies, in the sense that the three different roles of the triad may serve as inspiration in the design process [1].

In continuance of Fogg's work, researchers have taken a variety of approaches to persuasive design, several of which focus on development based conceptualizations of the persuasive principles presented in the functional triad. Most renowned within the PT research community, is the Persuasive System Design model (PSD), which was introduced by Oinas-Kukkonen and Harjumaa in the acknowledgement that the functional triad lacked a design oriented perspective [2]. The PSD model presents a categorization of the persuasive principles of the functional triad, which establishes a link

between these principles and well known features of requirement specifications, thereby making the categories more apprehensible for system developers.

Whilst the PSD model can be perceived as a broader approach to the development of persuasive technologies, similar steps have been taken within the narrower field of Information Architecture (IA), in which the persuasive principles related to Fogg's Tool category have been mapped to strategies commonly applied IA components [3]. The exploration of the notion of Motivating Information Architecture (MIA) leads to the conclusion that whilst the persuasive principles originally identified by Fogg, can be related to IA components, the principles themselves does not lead to any extraordinary design ideas, but did disclose features within IA where persuasive principles may have potential. However, the potential of the design principles are dependent on the way in which they are implemented, and the challenge remains in defining how, when, and where a persuasive principle may be most efficient.

The mentioned perspectives represent the primary methodological reflections related to PD presented within the PT research community, and both PSD and MIA constitute important and valid arguments regarding potential approaches to a deeper understand of PD. Other methods are described and commonly applied in relation to PD, such as The Design With Intent toolkit (DWI) [4] and concepts such as Value Sensitive Design (VSD) [5] and Inspiration Card Workshops (ICW) [6, 7]. However, PSD in particular but also MIA distinguish themselves by focusing specifically on PD, whilst the others constitute methods which are successfully applied in other research areas and have proven to also have potential in relation to PD.

At a general level both PSD and MIA approach PD with a primary focus on the design principles presented within the functional triad and both approaches appears to emerge from the expectation that PD constitutes a new approach to design of interactive technologies which claim may be potentially be established through a strengthened methodological foundation.

However, whilst PD does call for a stronger theoretical and methodological foundation, this commonly taken focus on the mentioned design principles is challenged once applied to more established research fields, as the novelty of the design principles is lacking not only in IA, but also in wider understandings of design. Also, the focus on the design principles rather than on the roles presented in the functional triad as originally intended by Fogg, does appear to complicate the identification of a unique claim in PD, due to the lack of novelty in the design principles.

2. Persuasive or just improved?

Amongst the areas in which the system oriented approach to PD has been challenged and found insufficient is the widely established area of technology enhanced learning, in the following exemplified by the EU funded research project e-PLOT (Persuasive Learning Objects and Technologies).

The e-PLOT project was initiated in November 2010 and aims to develop a pedagogical framework for active engagement, based on persuasive design, as well as to demonstrate its value by creating tools and exemplars of adaptable, reusable learning resources. The goal of the project has been to generate more effective active e-learning resources and provide teachers with the necessary tools to both create new and adapt existing resources to suit their needs.

The development perspective in e-PLOT aimed at further enhancing two specific learning technologies; GLOMaker and 3ET. The first being an authoring tool for creating learning objects, and the second an exercise tool which automatically generates grammatical exercises for language learning. Learning Objects and similar types of learning technologies have often been criticized for not taking learning theory and pedagogy into consideration [8, 9]. They are often described as taking a "water fall approach" to learning, by which "knowledge" is presented through a technology and students are expected to learn simply from being exposed to the learning material in a different and multimodal way. One primary issue with this approach to learning is that focus is on the presentation of the learning material, rather than on the actions of the learner. In the acknowledgement that persuasive technologies by definition require interaction between the user and the technology, it was

expected that a primary benefit of considering persuasive design in relation to learning objects would be the promotion of a more constructivist approach to learning, in which student motivation and activity would be a requisite for learning.

In the duration of e-PLOT, researchers have performed analysis of both the theoretical overlap between learning and persuasion, as well as an analysis of the practical application of persuasive principles in the two learning technologies. The approaches taken to the analysis were primarily inspired by the practices which have dominated the PT research field, such as the previously mentioned PSD model. Results show that, as expected, both in theory and in practice, the overlap is extensive, and that a vast number of persuasive principles have been applied in the learning technologies even prior to the PLOT project [10].

Consequently it was concluded that the claim of PD in relation to learning design was not constituted by the persuasive principles originally presented in the functional triad. As the persuasive design principles were already applied in the technologies, there was no reasonable argument that adding more persuasive principles to the design of the learning technologies would somehow make them persuasive rather than simply enhanced.

3. Persuasion rather than promotion

Based on the hypothesis that the physical location of the receiver influences the way in which a specific message is perceived, a similar study of the cross field between PD and digital mediation of cultural heritage (DMCH) is currently being researched. Current results within this second project supports the understanding that the unique claim of PD in relation to a more established research field is not determined by the persuasive principles themselves.

In the project, Kaj Munk's Vicarage in Vedersø, Western Jutland, is included as a practical outlet for exploring the theoretical and methodical connections that form the basis of the project. The museum, located in the actual Vicarage in Vedersø that was inhabited by Kaj Munk, was founded with the purpose of conveying the history of Kaj Munk as a writer, priest, and politician, and to make his historical connection to the Vedersø area apparent.

Kaj Munks' case is particularly interesting as his posthumous reputation is the subject of much discussion. Different groups have portrayed Kaj Munk's legacy or heritage very differently and there is little consensus on what can be viewed as Kaj Munk's contribution to Danish national identity. Some portray him as an overly nationalistic, religious figure, flirting with fascism in the late 1930's, while others see him as the symbol of the non-violent part of the Danish resistance towards Gemany during the occupation in WWII. This lack of consensus on Kaj Munk's historical significance underlines that his cultural heritage is not self-explanatory from the recollection of fragmented events in his life.

Cultural heritage can be seen as identity-forming and –reproducing and aiming to re-establish the lost relation to our past and rediscover our roots [11, 12]. E.g. the former Danish Ministry of Cultural Heritage was created in order to rediscover the cultural roots of the Danes in a project that can be viewed as more or less nationalistic in its aim: to establish a national identity. Cultural heritage is no exact science with predictable, measurable results but rather something emotional, political, and identity-related.

The notion of heritage itself contains some form of influence as heritage is something you are born into without question and that you have to feel an emotional relation towards. However, it is unclear whether cultural heritage is a choice or a duty bestowed upon an individual and subsequently whether it is based on persuasion or motivation. What is becoming increasingly clear is that the Danish cultural heritage is under increased pressure from competing cultural offerings through travels, movies etc. which underlines how mediators of cultural heritage are interested in reaching the broadest audience possible in a way where the intended image of national identity is clearly reproduced.

In this perspective lies the connection to persuasion but in a broader sense than traditionally experienced within the field of PD. In the field of mediation of cultural heritage the intention is not to achieve a narrowly defined behaviour or attitude towards a specific subject. The aim is more broadly

to motivate Danes to become more active users of cultural heritage experiences and change their views of cultural heritage to something dynamical that requires constant user engagement in order to renew its existence and justification. This motivation is more open than e.g. the intention of increasing visitor numbers at a specific museum or increase sales of a specific book with value towards cultural heritage.

4. Considering the notion of persuasion

The challenges faced when attempting to apply PD to various more established research fields, lead us to consider the notion of persuasion itself, rather than apply Fogg's notion of PT as basis of our understanding of PD.

The very idea of persuasion is commonly considered as having been brought into the world by classical rhetoric. In his 2003 textbook, Fogg made reference not only to the ideas presented by Aristotle, but also to the rhetorical notion of Kairos which may be defined as *the opportune moment* to perform a persuasive action [1]. Modern studies of persuasion are naturally influenced by other disciplines too, notably social psychology, anthropology, marketing and advertisement studies, usability and IT design etc. [13].

Several researchers have argued that the field of PD may learn a great deal from both classic and modern rhetoric, both in terms of methodology and in terms of gaining a deeper understanding of persuasion [14, 15]. Amongst the perspectives from classic rhetoric considered particularly relevant to PD is the mentioned notion of Kairos which is widely acknowledged as being a core concept to the field – this regardless of any differences in the general understanding of PD.

Kairos is described as three-dimensional and is often referred to as timing, or the ability to perform the appropriate action at the right time and in the right place. In term of appropriate, the performed action is required to be not only effective but also ethical in consideration of time, location and manner in which a specific action is taken [16].

In relation to the previous mentioned approaches to PD, Kairos is often taken into consideration from a narrow understanding of the concept and referred to as the appropriate moment to apply a given persuasive principle. However, PD may benefit from considering Kairos from a wider and more nuanced perspective in which the concept contributes to a more general understanding of the world and the context in which a technology is to be applied.

In other words, the understanding of Kairos in relation to PD should expand from including not only narrow translations such as "particular point in time" and "specific circumstance", to also include wider concepts such as "situation", "occasion" and "opportunity". Likewise, the perception of Kairos amongst practitioners of PD should develop from being mostly related to timing within specific design solution, to being a concept which places a strong focus on appropriateness overall, thus placing ethics as a core element in any approach to PD.

5. On the role of ethics in PD

Besides from addressing the importance of appropriate timing of persuasive initiatives, Kairos does also emphasize the importance of ethical reflections in the design process. The acknowledgement that persuasion must take place in an appropriate manner, does not only refer to selecting the principles to implement in a system, but also to a general understanding of the context in which the technology is to be applied. In light of the challenges faced when applying persuasive design principles to more established fields, it appears reasonable to explore if the potential claim of PD, may actually be related more to the understanding of appropriateness, and in continuance, the persistent focus on ethics.

Fogg originally defined PT as any type of interactive computer technology designed with the intent to change people's attitudes or behaviour, without using coercion or deception [1]. As such, PT by definition focuses solely on endogenous persuasive intentions, in the extent where the intention becomes a core element in the design. However, the definition also emphasises the importance of

ethical considerations, by accentuating that persuasive technologies do not coerce or deceive users whilst fulfilling persuasive goals.

The original definition of persuasive technologies is argued to be problematic in a number of ways. Amongst others, the emphasis on persuasive technologies being ethical is problematic as the perception of ethicality is based on the social reality of the evaluator, and a technology which appears perfectly ethical to the designer, may be considered unethical if applied in an unintended or unexpected use context.

In order to address some of the challenges related to the ethics of PD, steps have been taken towards a three dimensional approach to ethical evaluation, which considers not only the consequences of the technology but also the intention and the use context [16].

Commonly used approaches to ethical evaluation of technologies such as the ACM Code of Ethics, tends to place the primary responsibility of applying a technology, on the designers and developers, thus discarding the responsibility of the users who apply the technology. Contrarily, Albrechtslund argues that designers, are limited to conceiving only the intended use of a technology, but have no way of ensuring that the actual use will resemble their intentions. Once a technology is developed and handed over to the users, the perception of both the technology and the intended use is influenced by the context in which it is applied and the social reality of the users. In fact, the usage more often deviates from the original intention, making it inequitable to hold the designers solely responsible for the consequences of a technology [16, 17].

However, the acknowledgement that the designer is unable to foresee all possible use scenarios should not be interpreted as an excuse for the designer to disclaim responsibility for unethical use of a technology. Contrary, once aware that the technology may potentially affect users far beyond the intended aim the designers should more than ever be aware of the reciprocal responsibility which emerges between themselves and the users - and as such, ethical evaluation should be initiated from the very beginning of the development phase, whilst the notion of the technology is matured and explored [10].

Challenging as it may be, the strong demand for ethical reflections in relation to PD, may in fact be one of the aspects which distinguishes PD from other more established research fields such as IA, learning and DMCH. While persuasion in other design traditions is acknowledged as an integral part of a design process, PD enriches the design process with a communicative determination and a demand for a recurring ethical evaluation process.

The definition of ethics as a core element in PD is strengthened even further when the understanding of ethics is related to Kairos, and as such considered a vital perspective towards determining the appropriateness of a given persuasive strategy. Ethical considerations in the design process itself has so far been recognised as an important aspect [5] but it has generally not been seen as a necessity in persuasive design.

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FACING FACISM, UNIQUE BIOMETRIC IDENTIFIERS AND DATA TOTALITARIANISM: SOCIO-TECHNICAL CONSIDERATIONS

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Abstract
New technological facts, combined in a social perspective, highlight a possible data totalitarianism based on unique biometric identifiers. This article reviews those technological and social facts, highlights the socio-political implications and ventures some suggestion. Technological facts are: 1) non-cooperative visual biometrics, especially face and behaviour recognition (gait), and their multimodal combination; 2) wearable computing and augmented reality; 3) face recognition search engines; 4) interoperable biometric systems, making easy to enrol and recognize targets on different independent systems, and 5) the build-up of massive biometric data collections. Those technological facts may combine in a socio-technical arrangement where a securitarian culture prevails, as highlighted by: 1) social networks that fight a war on pseudonymity; 2) the "right to surveillance" is socially and legally un-encoded and asymmetrically distributed: ubiquitous surveillance is unevenly flanked by practices as crowdsourced surveillance or sousveillance. This socio-technical set-up highlights a condition where a new form of data totalitarianism may raise, especially in countries where technological advancement is not combined with equal improvement in privacy-awareness and democracy. Besides data protection authorities rulings, what initiatives could help to face this threat on a socio-technical ground? 1) Re-establishing information symmetry. This could be achieved through publicly accessible face recognition search engines and the decoupling of identity provider and content repository services, allowing both real name requirement and pseudonymity; 2) protecting privacy in the public context, assuming default opt-out from identity recognition.

Keywords
privacy, biometric data, face recognition, gait recognition, wearable computing, interoperability, pseudonymity, identity providers, data breaches, surveillance, sousveillance, re-identification.

1. New technological facts

There have been recent evolutions in face and gait recognition; new devices and services with potential severe effects on privacy are being tested.

1.1 Non-cooperative Visual Biometrics: face and behaviour recognition

Visual biometric techniques rely on images or video footage. *Non-cooperative* biometric systems are effective even on targets wishing to defeat the system in one or more phases of the recognition process, while collaboration is required in *cooperative* recognition (Goudelis, Tefas, and Pitas 2010; Wayman et al. 2005, 9). The main phases of the process are: *enrolment* (the extraction of a personal biometric feature, template or signature from images), *verification* (matching of other images against a single template) and *identification* (matching against a list of candidate templates) (Wechsler 2007, 4). Examples of *intrusive* visual biometrics are fingerprints, retina, iris, vein and palm scans and optical skin reflectance; while *non-intrusive* or *non-collaborative* visual techniques are centred on face recognition on conventional images or on facial thermograms (depicting heat). Thermograms are independent from ambient illumination and best suitable for covert surveillance. Increasingly, personal behavior characteristics such as smile or gait are used. (Goudelis, Tefas, and Pitas 2010; Xuan Zou, Kittler, and Messer 2007). Examples of *non-visual* biometrics are, for instance, voice recognition, body odor or head resonance (Wayman et al. 2005, 3).

A recent application based on the intuition that «colours of clothes, decorations, and even human motion patterns, can together make up a "fingerprint"» was demonstrated in a wearable-computer set-up, with Android Galaxy phones and camera-enabled glasses (Wang et al. 2013).

A so-called "multimodal" approach comprises the full range of technologies that could be used on a given image or video. An example is the FBI's Next Generation Identification searchable database that includes «facial imaging, scars, marks, and tattoos» and has «room to accommodate future biometric technologies (i.e., voice, gait, etc.) as they become available and prove reliable» (US Federal Bureau of Investigation 2009).

1.2 Wearable computing & Augmented reality

Google recently unveiled "project Glass" (Google 2013), a pair of glasses that "see" what is in the view field, overlaying information in a head-up display manner. This head mounted device could recognize voice commands, record video, take pictures, display text messages and maps. This kind of wearable computer "augments" the visual scene with additional information coming from the automatic analysis of the environment.

Even if visual biometric recognition does not seem to be in current Google glass features and was explicitly excluded from previous Google project Goggles (Adee 2010), it's well into its technical possibilities. Face recognition and gait analysis will eventually make its way into wearable computing devices. Probably Google Glass biometric recognition policy will be consistent and allow face recognition only for Google+ users that opted in. But third parties (like Baidu, see section **Error! Reference source not found.**, or Facebook) could develop apps with different privacy policies. Governments already have such devices designed explicitly with biometric visual recognition in mind (Yapp 2011; Beckhusen 2013).

Privacy implications of this technology are substantial, since wearable computing devices similar to ordinary glasses conceal the fact that they are acquiring video footage and automatically analysing the scene. Everybody in sight is a potential target of biometric recognition. People are unaware of having their biometric features being analysed and potentially recorded and ignore what use will be done of this information.

Advocates of wearable computing affirm that making available to the masses a biometric recognition device could re-establish an information asymmetry and also help "democratizing surveillance" (Weber 2012) and develop "sousveillance" or "watchful vigilance from underneath" (Mann, Fung, and Lo 2006) (more on this in section 0).

For instance, a wearable face recognition device could help to spot *agents provocateurs* and prevent them to disturb peaceful manifestations, as theorized in (Marx 2013). In fact, during "Occupy" protest in New York, pictures taken by protesters were used to identify and sue an officer spraying pepper on demonstrators (Coscarelli 2011), even if no use of automatic face-recognition was reported.

As we will see in section 0, it would be inappropriate to consider Project Glass as "sousveillance", given that all footage is centrally stored at Google's.

1.3 Face recognition search engines

Recently Baidu, the main Chinese search engine company, is testing an open face recognition search engine (识图 http://stu.baidu.com) (Ong 2013). This test service lets anyone upload an image containing a face and then run a search on matching images published anywhere on the Web. Google had decided in 2011 (Warman 2011) not to run a similar service because "too creepy".

Face recognition search services seen so far restrict their results on the image set provided by their users (store and match operations are *joint)* on consensual targets (Cammozzo 2011). Baidu face search fills the gap, delivering a *disjoint* store and match service on any target, with an *unrestricted* access to publicly available data.

Even if it's in a testing phase and not very reliable, such a search engine is a genuine novelty and has many privacy consequences (Cammozzo 2012). On the one hand it may represent a "stalker's paradise", on the other it may help anyone to figure out what kind of personal pictorial information is available and allow to take privacy measures. As we will see in section 0 it may help to fill an information asymmetry, also "democratizing surveillance" (Acquisti, Gross, and Stutzman 2011), and help to mature social norms that are more respectful for visual privacy.

1.4 Interoperable biometric systems

Data collected on one biometric recognition system can be used on another system only if the two are interoperable. This means that people enrolled on one type of software could be recognized by another system if those are interoperable and they share their data. For instance, US DHS and FBI biometric systems are interoperable (US Federal Bureau of Investigation 2012), while most of the apps that use face recognition to unlock a smart-phone are not.

Currently few systems are genuinely interoperable, probably because face recognition has been widely used only for the last few years and the technology needs to mature and consolidate; but as soon as this happens interoperability will soon emerge along with compliance to standards. For instance biometric passports already comply to ISO/IEC standard 19794 part 5 that defines biometric data interchange formats for face image data (ISO - International Organization for Standardization 2011). Compliance to standards and interoperability allow airport authorities to automatically match passengers faces with the biometric features and identities encoded on their passports: this is what "smart e-gates" do.

As already noted (Cammozzo 2011) while standardization and interoperability are technically desirable, they also make abuses easier in case of data breaches or leaks. Once interoperable biometric data for a given person is out of the system, any other system complying with the standard will be able to identify the target person.

1.5 Massive data collection, data breaches and government access

Even if its reliability is disputed, face recognition use is exploding. According to some analysts (Acuity 2009), biometric market will strike revenues of 10 billion dollars in 2017, of which up to 33% may come from face recognition. Visual biometric databases are being built around the world at an incredible pace for the most diverse reasons: from surveillance, to biometric passports, attendance systems, digital signage and marketing, down to games and authentication on cellphones. In the coming few years, it will be difficult for anyone to avoid being enrolled in some kind of visual biometric system.

In April 2011, the Sony PlayStation Network suffered a massive data breach: personal data of 77 million users were copied off the Sony servers. It's not known if biometric visual information was included in the personal and "profile data" that leaked; It may be possible, given that the PlayStation gaming system includes a face recognition system since 2009 (Flatley 2009).

What will be the consequences of massive visual biometric data breaches on a similar scale? If the biometric data is stored in interoperable format, the first consequence is that face and gait, more than names, will be a way to link data coming from different sources, even anonymous ones, legitimate or not. Moreover leaked data could be used to identify people in public spaces through CCTV surveillance, wearable devices or even your home smart video intercom.

Governments in all countries have ways to lawfully access any kind of personal information for law enforcing reasons. This applies also to social network data, independently of privacy options (see for instance Robinson 2012), and may happen in an automated way. Some countries may exert pressure even outside clear legislative frameworks. Depending on the democratic and legal status of a country, agreements between companies detaining biometric data and governments may be more or less transparent to the public and biometric data could be used for political purposes.

Government also hire private contractors to design and run CCTV and surveillance systems. Those contractors will likely serve private customers, and only a very strict privacy policy will keep companies off the temptation of sharing (or selling) data, or taking advantage of economies of scale. Suspects that this is already happening have hit the press (Wolf 2012).

2. Social facts

These technical facts make possible a global, unique, personal identifier around biometric face/gait recognition. This could be combined and linked to current social, economic and political trends to give an overall socio-technical perspective.

According to Nissenbaum, the two main sets of social norms dealing with privacy are norms of *appropriateness* that dictate what information about persons is appropriate, or fitting, to reveal in a particular context, and those that govern *flow* or distribution of information —movement, or transfer of information from one party to another or others. As a consequence, common practices are understood to reflect norms of appropriateness and flow, and breaches of these norms are held to be violations of privacy (Nissenbaum 2004). To avoid puncturing socially established privacy contexts, technological systems should try to comply to social norms. Computer code should follow social code, rather than assuming a "privacy is dead" attitude. On the other side, also social codes should adapt to accommodate technological innovations.

2.1 #nymwars: the war on pseudonymity and the identity market

The two biggest social networks, Google+ and Facebook, are fighting a war against their users pseudonymity. Their respective "real name requirement" pages state:

Real Name Requirement for Google+: [...] it's important to use your common name so that the people you want to connect with can find you […]. Name Changes are limited to 3 changes every 2 years. [...] Your nickname should represent you as an individual, and should not be used to represent a business or profession. (Google 2012a)

Facebook is a community where people use their real identities. We require everyone to provide their real names, so you always know who you're connecting with. This helps keep our community safe. [...] The name you use should be your real name as it would be listed on your credit card, student ID, etc. [...] We require everyone to provide their real names, so you always know who you're connecting with. If you'd like to list a second name on your account (ex: maiden name, nickname, or professional name), you can add an alternate name. (Facebook 2013a)

Users not complying will see their accounts suspended. For suspended accounts, both companies are relying as a last resort, on some form of government-issued photo identification (Facebook 2013b; Google 2012b).

These measures have been heavily criticized under ethical and privacy considerations as a defence of corporate interests (Elliott 2012) and as an authoritarian exercise of power against vulnerable people and marginalized communities: those who use pseudonyms are not only paedophiles, but also rape survivors, victims of stalking, political and sexual minorities; or simply, communities with a tradition of nicks and pseudonyms, as artists and "techies" (Boyd 2011). Often pseudonyms are not a sign of "lack of integrity", but a security need and a way to preserve the norms of appropriateness and flow of a privacy context.

A strong reason for social networks to require real names is that they are silently fighting for a share in a new global single-sign-on market as identity service providers. Besides the business of providing social network services for their users and that of advertising, they are becoming identity service providers (so called "connect" services) for third parties, like other content providers who don't want do build a users database for authentication themselves (Ko et al. 2010): increasingly we see sites asking users to authenticate using Facebook or Google+ credentials.

As we will see below, from a security and privacy point of view it would be better to unbundle the two services: one party should acts as an identity provider and know nothing about the content, the other keeps sensitive biometric content, ignoring the real identity and trusting the identity provider.

Given the huge mass of biometric data stored in social networks, real name policy implies that pictures and videos linked with each unique real name identity could lead to re-identification, as it has already been demonstrated (Acquisti, Gross, and Stutzman 2011).

2.2 Securitarian culture and asymmetric "right to surveillance"

Our cities, malls, shops, schools, bars and even homes are increasingly pervaded with CCTVs and webcams, often for security reasons but also for marketing or even more frivolous purposes. But who is watching who is often not so clear. Classic "panoptic" surveillance enacted by government, communities and shop owners is being flanked by other practices: with the terms crowdsourced surveillance Schneier (2010) describes (mostly failed) examples of traditional centralized surveillance where the task of watching the actual video stream is crow-sourced. In these examples, volunteer or paid citizens watch pictures and videos to spot shoplifters (interneteyes.co.uk) or the US-Mexico border (texasborderwatch.com) or people in no-man's lands (US HomeGuard). Another practice is what Steve Mann, a renowned researcher and advocate of wearable computing, calls sousveillance or "watchful vigilance from underneath". Mann also foresees the emergence of a state of "equiveillance" or the balance between surveillance and sousveillance (Mann, Fung, and Lo 2006). This concept recalls the idea that dispersing visual recording technologies between citizens could help "democratizing surveillance" (Acquisti, Gross, and Stutzman 2011; Weber 2012).

We are being socialized into accepting video surveillance *"for our own security", even if we know that often security cameras actually are not about security. W*hile traditional surveillance is usually accepted socially and regulated by law, other processes –especially sousveillance– are socially and legally un-encoded and not so clearly accepted. Mann reports that while he was in a Paris McDonalds he had been assaulted because of his wearable computing video recording device (Mann 2012). McDonalds employees asked him to stop filming to "protect the right of privacy of staff and customers". Mann observed that staff and customers were already filmed by McDonalds surveillance cameras, and later raised the question on his blog: «It would seem that society has come to accept ubiquitous surveillance without questioning it. Regardless of whether or not ubiquitous surveillance is justified, should those people who accept surveillance not also accept sousveillance?». This question stays open, along with others on the social consequences of ubiquitous visual equiveillance.

Another example is the "social experiment" run by the Seattle "Creepy Cameramen" who goes around holding a video-camera and recording people's reactions (Bishop 2012) and saying «I'm just taking a video» since «video cameras are everywhere...». Reactions go from people getting up and leaving, others insulting him, pushing him put of places, calling the police or physically attacking him.

What these examples show is an amazing social asymmetry: people have become rather indifferent to CCTV cameras in streets, offices, malls and even watching them from billboards, but are pretty reactive when someone actively films them. There is strong social resistance against being video-recorded by unknowns for unknown reasons. Sousveillance – except in some specific contexts – does not seem to be viable. I push forward the hypothesis that what people accept or refuse are the underlying *reasons* behind being surveilled, not surveillance *per se.* If there is the hint of a reason, and that reason is implicitly accepted under the assumption of an advantage or at least no harm, surveillance is tolerated.

3. Combined technical and social asymmetries

On the issue of visual biometrics, all four kinds of code interfere: the legal, the social, economic rules and computer programs (Lessig 1998; Lessig 1999).

On the technical side, we have seen that visual biometrics (face and gait recognition) can represent a unique personal identifier. We have also seen that an enormous mass of those identifiers are being

collected from a number of operators, that if biometrics are standard or interoperable those identifiers can be linked to a single identity (re-identification), and that massive personal data breaches do indeed happen. This introduces a huge information asymmetry: unknown entities may know things about us that we don't know.

On the social side we have seen another asymmetry: while sousveillance is considered creepy, biometric recognition and ubiquitous surveillance are socially accepted, and social network companies are succeeding in enforcing a real name requirement against pseudonymity. This allows them to become identity providers for third parties, but also to link each single unique biometric identifier to a single real life identity. Legal codes and social norms accept and regulate top-down surveillance but are socially and legally unprepared to cope with bottom-up sousveillance.

This combination introduces another greater asymmetry: the ability to control the appropriateness and flow of information about us belongs to someone that is not us. According to the Nissenbaum definition, this means that our privacy is not in our hands. On a global scale, this ability is in the hands of few companies and governments. Because of technical innovations and social unpreparedness, societies face a possible data totalitarianism based on biometric unique identifiers that may be called "facism".

Is the society aware? The imminent launch of Google Glass is producing harsh reactions (Champion 2013). The presence of surveillance glasses in streets and bars will perhaps represent a "privacy Chernobyl" event, as described since 1999 by Phil Agre (Gruteser and Grunwald 2004). A no-return event that raises a "privacy panic" reaction on the dangers of surveillance. This kind of reaction may actually deepen the asymmetry, as the victim of a panic reaction could be the right to sousveillance, and not the ruthless exploitation of personal data: a ban for people from to record in public with wearable devices, and not a ban on ubiquitous surveillance "for security reasons".

4. How to face it? Re-establishing information symmetry

Data authorities have become quite responsive to issues linked to biometric visual data. US FTC has issued recommendations on face recognition (US Federal Trade Commission 2012) and in the EU a new data protection regulation has been proposed that explicitly takes into account "large scale biometric personal data" and the "right to be forgotten" . Besides the necessary legal initiatives, what are actions are likely to foster a social response in a direction that avoids data totalitarianism?

While computer programs behaviour is to some extent predictable, it's extremely difficult to design measures that could impact on social norms. Some measures, playing on awareness and allowing systemic feedback, could perhaps help to re-establish an information symmetry.

1) Publicly accessible face recognition search engines, as the test site of Baidu, can help re-establish a symmetry. Anyone can check what biometric data is linkable to her identity, leading to a full awareness of what kind of visual information is available also to others. She can also take appropriate steps to delete data she wishes to stay private, provided an adequate "right to be forgotten" is enforceable. This reduces the risk that *personal data is provided to thirds by entities running similar services covertly. One great downside* of this approach is that only privacy-aware and tech-savvy users will be able to limit the availability of personal biometric data.

2) To face the issue of biometric data linked to real identities, we could design and investigating a technical arrangement where the identity provider is separated from the content or service provider (eg. social networks, e-mail, website requiring authentication). The entity who identifies the user should know nothing about her content, while the party who provides or stores user content trusts the identity provider about her access credentials. This is what happens with single-sign-on systems. Each user could, if he wishes, use multiple identities from several different identity providers. While keeping the freedom to use pseudonyms for most services, users can be required to provide real names, according to the type of service requested. Reliably linking together multiple identities to one real name is made more difficult. Law enforcement could access both parties (identity and content) with a single warrant.

3) As a general rule, privacy in the public context should be protected assuming default opt-out from non-cooperative biometric visual recognition. Users enrolled in biometric recognition systems should be specifically informed on all possible uses, scope and duration of their data. Exceptions for specific cases should apply.

The matter is evolving very rapidly, so we are going to see in the next few years what will be the outcome of the interaction of computer code with social norms together with market and legal rules.

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IS/IT ETHICAL ISSUES AS A CORPORATE SOCIAL RESPONSIBILITY: REVISITING STRATEGIC BUSINESS PLANNING UNDER THE LENS OF IS/IT ETHICAL PREOCCUPATIONS

Anne Chartier and Bernard Plante

Abstract
The traditional approach to organizations' strategic planning process focuses on market and business opportunities and ignores IS/IT ethical issues linked to organizations' technical choices. All too often ethical issues are presented as specific issues associated to project development course. Considering the fast and large spreading of IS/IT networks widely outside organizations' frontiers and the extent of the IS/IT use in organizations, their social, economic and ecological impact, this scheme ought to be revisited. For a more consistent vision of strategic planning process with the Net Economy parameters, we formulate guidelines to integrate IS/IT ethical issues as organizational strategic issues and we propose a clearer distribution of responsibilities regarding IS/IT ethical issues across the organizations' strategic, tactic and operational level.

Keywords
Business ethics; organizational strategic planning; IS/IT ethical issues; corporate social responsibility

1. Introduction

Authors interested on business ethics have stated the important role of IT« as a tool to improve the efficiency and effectiveness of corporate governance» (Rezzae, 2009, p. 324). However, even if IS/IT has significant impacts on market as well as on business, few concerns are given to the IS/IT ethical issues which could beat strategic impact. In a previous era when IS/IT systems were few or were used as closed systems, a narrow view of IS/IT ethical issues was acceptable. However, considering the important role IS/IT play in the day-to-day functioning of organisations, the fast and large spreading of IS/IT networks widely outside organizations' frontier, the extent of the IS/IT use in organizations and their social, economic and ecological impact (Wilkin and Cerpa, 2012), IS/IT choices in organizations cannot be considered as neutral.

As proposed by Brey (2000:2), "the scope of computer ethics includes individual and collective practices that involve computers, in order to reveal the moral import of practices that appear to be morally neutral". Organizations should not only be preoccupied with defining the best IS/IT strategy to ensure the IS/IT alignment to increase the business profitability, they must also be preoccupied by the ethical impact of their strategy on the business ecosystems as well as on the society as a whole (Spinello, 2011). A change in the traditional strategic business planning process is required to incorporate IS/IT ethical issues to reach a better fit to the Net economy reality. We ought to revisit this scheme and propose a vision consistent with the Net Economy parameters.

Organizations of the net economy should show concerns about the IS/IT ethical issues throughout the strategic planning process. Scholars working on Corporate Social Responsibilities (CSR) have tried to tackle categories which should be included in the evaluation of an organisation's responsibilities. However, at the organizational level, information systems and information technologies (IS/IT) and their ethical issues are not taken into account in those categories, despite the prominent role they play in organisations, in economic and in society. All too often, ethical issues are presented as specific issues linked to project development course, with concerns mainly with privacy or with security issues, or with incident arising in the use of IS/IT artefacts as consequences of users, computer professionals or external criminals' misbehaving.

Which IS/IT ethical concerns should be taken into account at a strategic level and which one at an operational level? What are the links between the organizational strategic planning process and the identification of IS/IT ethical issues? Questions like these ought to be tackled. An organization's strategic planning process should ponder the ethical benefits and drawbacks resulting from the dissemination of information systems and technological artefacts.

This paper analyses ethical issues at three organizational levels: strategic, tactic and operational. Taking IS/IT ethical issues into account at all organizational levels constitute a profound change with the prevailing theories. The aim of the paper is to clarify why the strategic planning process must take ethical issues into account, explain which IS/IT ethical issues should be considered at different levels in the organizational planning process and propose guidelines to integrate IS/IT ethical issues as a dimension of a strategic planning process evaluation category.

The first part of the paper presents the limits of the actual tools used to evaluate organizational strategic planning process bearing in mind IS/IT ethical issues. The second part exposes why computer ethics should be deliberated at the strategic level of organisations. The third part presents some IS/IT ethical issues of importance to all organizational levels and proposes guidelines to incorporate those issues in the forethought.

The paper should interest academics as well as managers and IS/IT professionals who care about taking into account a global vision of IS/IT ethical issues as a corporate social responsibility.

2. Any concerns for IS/IT ethical issues at the strategic level?

With IS/IT pervading all organizational levels in all organizational spheres, moreover with the development of Internet-based systems, one could think IS/IT ethical issues are a strategic organizational concern. However, a rapid examination of both strategic planning evaluation process dimensions, Corporate Social Responsibility (CSR) categories and IS/IT strategic planning evaluation dimensions show that there is little concern toward ethical issues linked to technological choices in organisations. IS/IT ethical issues are too often narrowed to the sole responsibility of IS/IT professionals or IS/IT users.

2.1 The Strategic Planning Process

The *Strategic Planning Process* is the establishing of strategic goals, mission and values of an organization as well as products and services offering. As illustrated in Figure 1, its main objective is to answer the question "*Where is the firm going considering the market opportunities?"*. The next step answers the question "*How can we attain these goals?"*. This questioning will be answered, among other activities, by outlining an IS strategy. The final step seeks an answer to the question "*What is required*?", a questioning resulting in IT architecture.

Different tools can be used to evaluate the attainment of strategic objectives. These tools, described as Performance Measurement Systems (PMS), are used to report financial and non-financial measures (Länsiluoto and Järvenpää, 2010). The most popular one is the Balance scorecard (BSC) developed in 1992 by Kaplan and Norton.

Balanced Score cards (BSC)

BSC can be used either to internally evaluate managerial performance or to interpret information from the external business environment. The dimensions retained to measure the attainment of these objectives are good indicators of the managers' preoccupations. BSC has demonstrated to be useful to tackle organization's performance regarding its strategic plan. The four dimensions of the BSC are: financial, customer, internal business process and learning and growth (Cheng and Humphreys, 2012). Ethical issues do not appear as a dimension to be evaluated at the strategic level. This could explain why, in the last decade, efforts have been done to re-examine the use of BSC and other performance measurement systems with a growing concern to environmental management issues (Länsiluoto and Järvenpää, 2010). Since the sixties, voices have risen to ask questions about businesses social

responsibilities (Schwartz and Carroll, 2003). These questions have resulted in the development of a research domain dedicated to Corporate Social Responsibility (CSR)

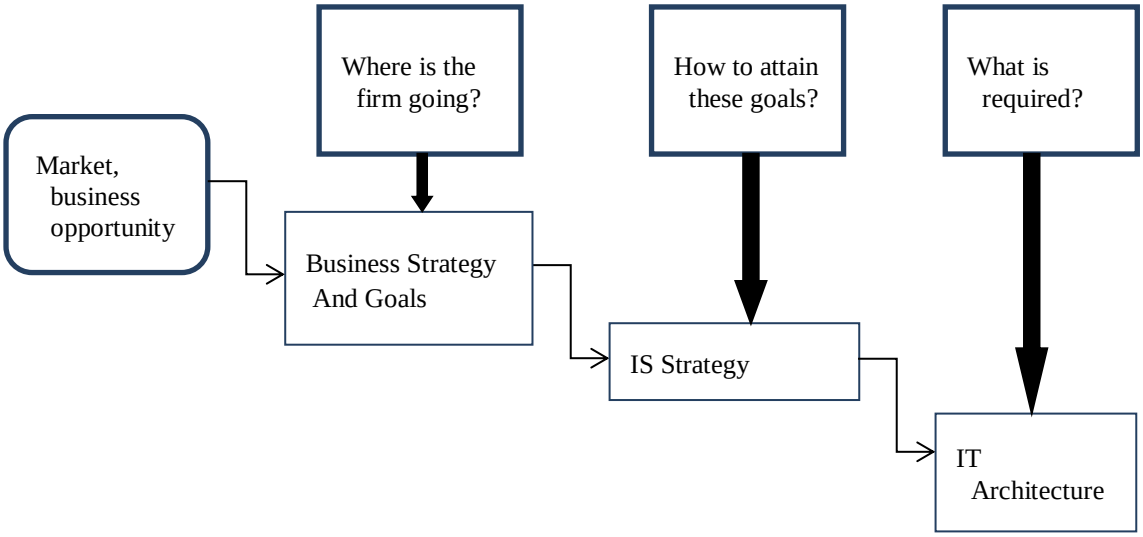

Figure 1 – IS/IT planning process

Corporate Social Responsibility (CSR)

CSR focuses on what should be "the proper relationship between business and society" (Schwartz and Carroll, 2003:503). For decades, scholars have tried to tackle the categories which should define CSR. In 1979, a definition of social responsibility's categories by Carroll (1979) stated that "to fully address the entire range of obligations business has to society; it must embody economic, legal, ethical and discretionary categories of business performance" (Carroll, 1979 cited by Wan-Jan, 2006:179). In 2003, Schwartz and Carroll proposed that CSR was composed of three domains: economic, ethical and legal. Maon *et al*. (2008) have stated that CSR issues can be defined as the result of the influence of four key drivers: economic, social, political, and individual. The three first drivers are identified as market based "in that they initiate when an organization anticipates or responds to a risk associated with the societal impact of its particular business practice […]", whereas individual drivers "[…] appear to be value based and highlight the CEO's role in orienting the ethical norms of the organization […] and the presence of employees' values in the workplace." (Maon et al., 2008:78).

It is important to notice that two elements are absents from CSR model. The first one is the ignorance of technology as a driver for CSR issues. There seems to be a lack of direct concern toward IS/IT either as tools used by almost all organizations or as products or services offered by others (Pouloudi and O'Keefe, 2006), notwithstanding the fact that IS/IT pervades every sphere of the society. The second one is that IS/IT ethical issues do not seem to explicitly be a concern in the whole process. One may think these elements wiil be taken into account by another planning process which focus is information systems planning.

Strategic Information Systems Planning (SISP)

The Strategic Information Systems Planning process, which follows the organisational strategic planning process, is considered as a critical component of business performance. Strategic Information Systems Planning (SISP) is seen as a function of strategic management in organizations to ensure integration between business and IT functionalities. Its aim is to achieve "better business outcomes through better IT performances" (Wilkin and Cerpa, 2012: 53). The alignment of IS/IT to the strategic planning has long been established as inescapable to ensure organisational performances (Henderson and Venkatraman, 1993; Guillemette and Paré, 2012). Since the lack of concerns for IS/IT ethical issues at the strategic planning process, it would seem logical to take these issues into account in the Strategic Information Systems Planning (SISP) process. The IS/IT planning process usually takes place after the business strategy planning process with a delegation of IS/IT strategy to IT specialists (Ward and Peppard, 2002). Segars et al. (1998) has identified six dimensions to a structured approach

for reviewing the SISP process: *comprehensiveness*,which preoccupation is the extensiveness of the search for solutions, balanced against the costs of time and financial resources; *formalization*, which concern is the existence of structures, techniques, written procedures, and policies guiding the planning process to obtain efficiency gains ; *focus*, which is the balance between creativity and control orientations either as innovative approaches to opportunities and threats or integrative approaches linked to control (through budgets, resource allocation, and asset management); *flow* is the locus of authority and devolution of responsibilities either as a top-down or as a bottom-up approach; *participation* refers to the extent to which multiple functional areas and key personnel at lower levels of the organization are involved, as well as the extent of lateral communication in the process; *consistency* refers to the frequency of planning activities and performance evaluation which indicators are: frequency of meetings, constant communication and reassessments of the overall strategy. These dimensions are proposed as "foundations for structuring dialog regarding the SISP process" (Segars et al., 1998:17).

Table 2 – Preoccupations of the organizational or the IS/IT strategic planning processes.

Model	Dimensions	Authors
BSC	financial, customer, internal business process, learning and growth	Cheng and Humphreys (2012)
CSR	economic, legal, ethical and discretionary categories of business performance	Carroll (1979)
CSR	economic, ethical and legal categories	Schwartz and Carroll (2003)
CSR issues	Market based drivers : economic, social, political Individual drivers : highlight the CEO's role in orienting the ethical norms of the organization […] and the presence of employees' values in the workplace	Maon *et al*. (2008)
SISP	Six dimensions for reviewing the SISP process: comprehensiveness, formalization, focus, flow, participation, consistency	Segars et al. (1998)

Table 2 summarizes the different preoccupation levels demonstrated in the planning processes either as organizational strategic planning process or as IS/IT strategic planning process. IS/IT ethical issues do not seem to be among the chief preoccupation of a strategic planning process. These issues are taken into account neither at the strategic level nor during the IS/IT strategic planning process. Even in the context of the so-called "e-society", IS/IT ethical issues are not even considered as a by-product of the SISP. When it comes to organizations' responsibilities ethical issues appear to be considered mainly as users' or computer professionals' responsibilities (Figure 3). All too often they are talked about as specific issues linked to project development course, mainly privacy or security issues, or to incident arising in the use of IS/IT artefacts as a consequence of users or computer professionals' misbehaving. Organizations' responsibilities are hardly ever invoked.

Ethical issues are often directly associated to the computer professionals' role and little attention is given to IS/IT ethical issues as a corporate responsibility even when strategic organizational choices should be pondered in the equation.

Computer ethics cannot be the sole responsibility of computer professionals. Their professional code's aim is to guide computer professionals' behaviours with the main goal to protect society. It is proposed as a guideline defining standards of good practices and codes of behaving. It can't be implicitly assumed that computer professionals possess all the expertise to evaluate the impact of their actions or the consequences of the organisation's technical choices on society. Computer professionals ought to be conversant with their professional practices' ethical aspects; they must also be in the right context and have the time to think about those ethical aspects. However, computer professionals are often more concerned by the technical side of their work. Many ethical decisions are beyond computer professionals' competency and sphere of influence. Moreover, many computer professionals work for organizations which have their own business code of conduct, codes which can be more preoccupied

by the organization's stockholders or other stakeholders' well-being or which lean on a social contract linking the organization's own interests to those of its business ecosystem.

CEO and managers make strategic choices and organizational policies. They should be aware of the ethical issues and consequences related to of IS/IT choices. Ethical issues should be managers' responsibilities as well as a computer professionals' one. Which IS/IT ethical issues should be considered as an organizational strategic topic and which one should be hand over computer professionals? The next section is an attempt to delineate these responsibilities and propose a framework linking the organizational choices across an organization considering IS/IT ethical issues.

3. Why computer ethics should also be deliberated at the strategic level of organisations?

IS/IT have an impact on the society as a whole. They contribute to shape our society. For example, one may wonder if those who have created digital mobile networks where thinking of the impact their project would have on youth, on social relationships, on the way we are learning, making business, giving cares to patients in clinics or in hospitals, etc.

As stated by Brey (2000:1) : " The scope of computer ethics includes individual and collective practices that somehow essentially involve computers […] practices like the use, development, regulation, management, advocacy and advertisement of computer technology […] the products of such actions, e.g., computer systems and software, manuals, advertisements, and laws and policies regulating the use of computers. These products deserve special mention because their moral properties may be analyzed independently from a consideration of the actions that have led to them."

Exclusion of IS/IT ethical issues as a global strategic issue ignores the pervading role IS/IT play in every sphere of the society as well as the economic and social impacts they have and the prominent role of High Tech Companies (Krumsiek and al. 2003).

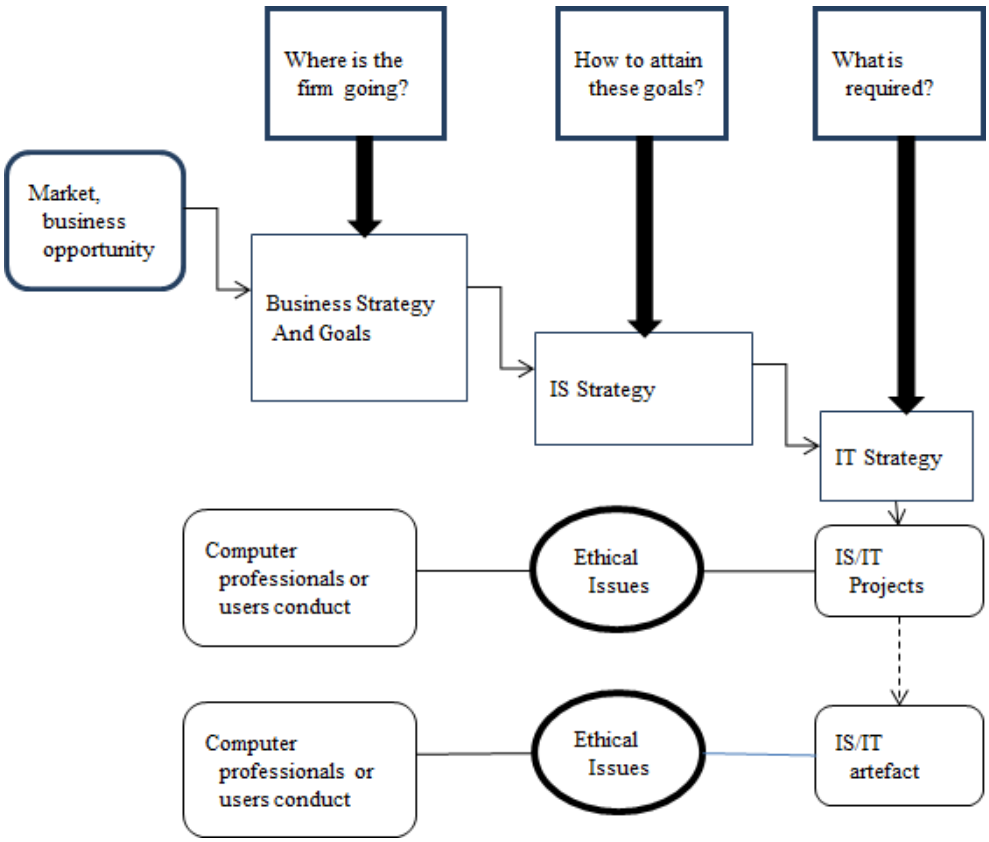

Figure 3 Ethical issues as a professionals or users' responsibility

3.1 Computer ethics, a must considering IS/IT influence on organizations

The central aim of computer ethics is to formulate policies to guide individual and collective action in the use of computer technology (Moor 1985). Computer ethics, as a branch of applied ethics, should also be concerned with other practices that involve computing technology. It should be concerned with practices such as its development or management which require the formulation of policy guidelines (Brey, 2000). According to that view, the aim of applied ethics is not purely to arrive at well-supported moral analysis, but also "to use such analyses to affect the discourse, policies and practices that are prevalent in its domain of study" (Brey, 2000: 1).

Strategic planning process ought to be improved to take into account IS/IT ethical issues, given IS/ITs' crucial role either as products or services sold by organizations, either as tools they buy (Pouloudi and O'Keefe, 2006) or as applications or artefacts used by people as direct or indirect users and consumers of IT artefacts or of software. IS/IT change the way social life is conducted. Organizations are dependent on one another regarding the electronic information which flows through electronic data interchange systems (EDI) between organizations. Good deal of official (black arrows) and non-official information (white arrows) are transmitted and collected through organizations' operations.

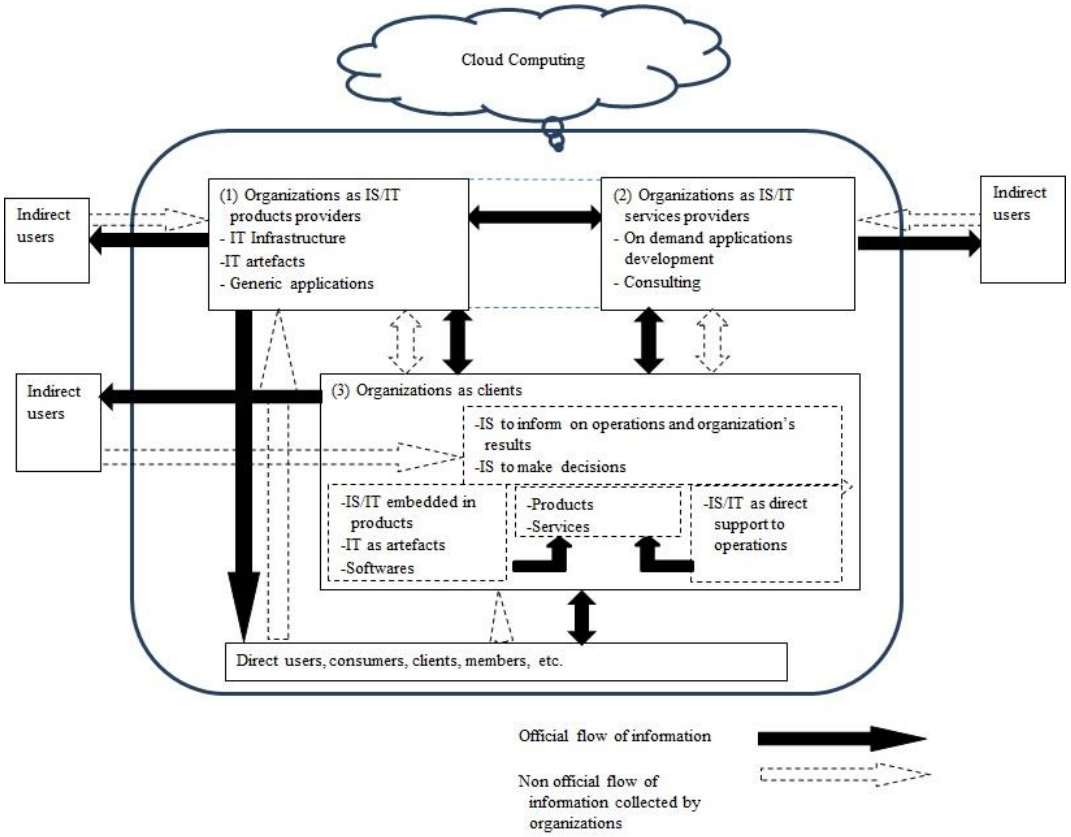

Figure 4 – IS/IT as vectors of organizations relationship

Official and non-official information flow between organizations, between organizations and formal users or clients, but also between organizations and informal users is a complex process (Figure 4). Products provided to client organizations (1) can consist of IT infrastructure (e.g. net wares), IT artefacts (e.g. computers, laptops, mobile phones, etc.). Generic applications (e.g. ERPs, CRM, online games, etc.) are sold to organisations or to consumers. Online social networks such as Facebook, Linked In or Twitter appear "free of charges" to direct users. However, these free of charge services come with a cost because their by-products consist of raw data about users sold to client organizations. Some organizations are IS/IT services providers (2). They offer support to develop on demand applications or they offer consulting services on IS/IT products or generic applications. High-

tech organizations may develop products and offer support altogether to organizations which are their clients.

Client organizations (3) buy IS/IT from providers to be used either as direct support to their operations (e.g. the use of surveillance systems and Global Positioning Systems (GPS) to monitor truck fleets or just-in-time systems which create new ways of operating). IT functionalities are embedded in products and organizations' business processes are intertwined one into the other. IT artefacts are implanted in products sold to consumers.

Considering the complexity of official and non-official information flow in organizations and the pervasive role IS/IT play in the relationships between organizations but also between organizations and the society, it is difficult to deny the importance of IS/IT ethical issues at all organizational levels. What concern should be addressed at each organizational level (strategic, tactic and operational)? The next section posits IS/IT ethical issues as strategic decision making issues.

3.2 IS/IT ethical issues as strategic decision making issues

In 1995, Mason et al. (1995) stated that the challenges posed by the information society call for a new social contract which must reflect the primary social and economic activities of the society. Organisations cannot ignore their role in this agreement and cannot deny their responsibilities either as IS/IT providers or as IS/IT consumers. With a clearer allocation of responsibilities among organisational levels, managers should be able to better target ethical decision making at each organizational level hoping that IS/IT ethical issues will be better taken into account as a strategic issue.

Strategic level

Overall, CEO should ask questions about the IS/IT alignment choices and their coherence with the ethical values promoted by the organization. Technological choices should exemplify those values. The premise to this proposition is that CEO are aware of technological choices and aware of IS/IT ethical issues. At the strategic level, organizations should discuss IS/IT ethical issues and formulate clear orientations regarding ethical issues and technological orientations (e.g. ecological choices in acquiring or discarding technological artefacts, choices of favouring free software solutions against commercial ones, information justice toward those who provide the data the organization makes use of, technological implementation and the quality of life in the workplace, prohibiting the information control abuse, the digital divide as a form of social exclusion, etc. (Pimple, 2011)).

Tactic level

At the tactic level, a crucial question should be how will technological choices affect people's job and their lives. Managers and professionals should ask What can be done to maximize positive effects of technological choices and minimize negative impacts? What are the consequences of the computer systems design for the autonomy of users (Brey , 1999, 1998)? What are the biases in their computer systems (Friedman and Nissenbaum, 1997)? Other topics to be considered are the IS/IT ethical issues and consequences of IS/IT choices invisible to the users, taken-for-granted or simply unnoticed by most people (e.g. pervasive computing, ubiquitous computing, ambient intelligence).

Operational level

At the operational level, there is a wide range of ethical issues which are important to the practice of IS. Numerous topics and preoccupations have emerged and arisen the attention of researchers about IS/IT ethical issues: codes of ethics for IS practitioners, issues of privacy and security, combating of cybercrime, intellectual property disputes, and hacking to name a few[1] (Mingers and Walsham, 2010). Professionals should ask which values are embedded in the design of their computer systems and technological choices. How to make managers aware of IS/IT ethical issues? What can be done to

[1] See the seminal work of Mingers and Walsham (2010) who present an interesting and global portrait of research topics related to IS/IT ethical issues having arisen researchers' interest in the past years.

better promote IS/IT ethical issues across all the organization? Table 3 summarize the questioning which should prevail at each level.

Strategic level	CEO and CIO	IS/IT alignment choices and their coherence with the ethical values promoted by the organization. How do technological choices exemplify those values?
Tactic level	CIO and project managers	How technological choices affect people's job and their life. What can be done to maximize positive effects of technological choices and minimize negative impacts?
Operational choices	IS/IT professionals	Which values are embedded in the design of our computer systems and technological choices? How to make managers aware of IS/IT ethical issues? What can be done to better promote IS/IT ethical issues across all the organization?

Table 3 – Questioning pertaining to each organizational level

3.3 IS/IT ethical issues as a corporate social responsibility dimension

Ethics should not be considered as a dimension apart from other dimensions but should be embedded in all organizational preoccupations whether they are economic, legal or technological. Organizational and IS/IT strategic planning processes' preoccupations presented in section 2 of this paper are revisited to include IS/IT ethical dimensions, as summarized on Table 4 (text in bold fonts underlines the ethical vision which should be embedded in all organizational activities rather than being considered as a separate organizational category).

Balance score cards (BSC) used to evaluate results of the strategic planning process could include an evaluation of IS/IT ethical dimension by asking questions on *how do technological choices exemplify organizational values through their impacts on finance, customer, internal business process, learning and growth*.

IS/IT ethical dimension could be included as a corporate social responsibility (CSR) by asking How technological choices affect people's job and their life? What are the IS/IT ethical issues linked to our technological choices? How are our values embedded in the technological, economic, environmental and legal dimensions? How are ethical issues linked to the economic, environmental and legal dimensions?

Considering the social and economic impact of technology, technology should be included as a market based driver for corporate social responsibility issues. Individual drivers should also include the mastering of IS/IT knowledge and their ethical issues. These are crucial factors to a CEO's capacity to evaluate the ethical norms coherence throughout the organization as well as the capacity of employees to ensure coherence between technological choices and values in the workplace.

Finally, two more dimensions should be added as dimensions to evaluate IS/IT strategic alignment: IS/IT knowledge at all levels, IS/IT ethical awareness. IS/IT knowledge should evaluate what can be call employees' "technological alphabetization". The higher an employee's responsibilities, the higher technological alphabetization should be in order to be able to evaluate the impacts of IS/IT choices regarding ethical issues or what may be call "IS/IT ethical awareness".

Considering the impacts of IS/IT organizational choices and the pervading effects of technologies in all sphere of the society, it is legitimate to include questioning on IS/IT ethical issues as part of the organizational strategic planning process. Such questioning should take place at all organizational levels and should be embedded in tools which are used to evaluate the results of the strategic planning process whether it is Balanced Score Card, Corporate Social Responsibility categories or the dimensions for reviewing the Strategic Information Systems process (SISP).

Table 4 - Preoccupations of the organizational or the IS/IT strategic planning processes revisited

Model	Dimensions
BSC	How do technological choices exemplify organizational values through their impacts on finance, customer, internal business process, learning and growth?
CSR	How do technological choices exemplify organizational values? How technological choices affect people's job and their life? What are the IS/IT ethical issues linked to our technological choices? How are our values embedded in the technological, economic, environmental and legal dimensions? How are ethical issues linked to the economic, environmental and legal dimensions?
CSR issues	Market based drivers : technological, economic, social, political Individual drivers : IS/IT knowledge at all organizational levels influence the CEO's role in orienting the ethical norms of the organization […] and the capacity of employees to ensure coherence between technological choices and values in the workplace.
SISP	Eight dimensions for reviewing the SISP process: IS/IT knowledge at all levels, IS/IT ethical awareness, comprehensiveness, formalization, focus, flow, participation, consistency.

4. Conclusion

A brief examination of the Balance Score Card dimensions, the Corporate Social Responsibility (CSR) categories and the IS/IT strategic planning evaluation process's dimensions show that there is little concern toward IS/IT ethical issues as a strategic issue despite the scope and the important impact of IS/IT in organizations and in society. An illustration of the complexity of the relationship and the intertwining of information flow between IS/IT providers, IS/IT client organizations, direct and indirect IS/IT users is proposed to underline the fact that IS/IT ethical issues should be considered as a strategic issue and contend that managers at all levels cannot ignore their responsibilities regarding these IS/IT ethical issues.

A first limit of this paper resides in the limited literature review of the strategic planning process evaluation dimensions. However, following this preliminary analysis, this research topic appears to be a promising one. A second limit relates to the non-systematic inventory of the IS/IT ethical issues. A finer analysis would contribute to give a finer understanding of which ethical issues should be of a concern to each organizational level. It would also contribute to improve the proposed guidelines. Future researches should clarify these points. Moreover, it would be interesting to better understand the CEO, managers and computer professionals' role in the process of identification the ethical issues.

Two original contributions must be underlined. The first one is the delineation of responsibilities among strategic, tactic and operational organizational levels regarding the questioning about IS/IT ethical issues, with the hope that those issues will be taken into account as a strategic issue. The second one is a revisiting of strategic evaluation tools and the proposal of guidelines to tackle IS/IT ethical issues.

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MORAL REASONING IN E-LEARNING GENERATIONS: FROM 1.0 TO 4.0

Gonçalo Jorge Morais Costa, Nuno Sotero Alves Silva and Tiago Filipe Rodrigues Fonseca

Abstract
This paper explores two hot topics in e-learning literature: moral reasoning (bond to ethical and social issues) and its generations. Future educational environments impose a dramatic shift regarding "educational actors", since include non-human agents. These novel "educational agents" promote unforeseen ethical and moral dilemmas which e-learning literature seems to disregard. Recent e-learning empirical data (second co-author PhD) serve as analytical starting point despite potential limitations. This paper is divided into three sections: guiding concepts (moral reasoning and e-learning); ethical and social dilemmas- evaluating e-learning (authors' argument and Stahl's framework); and, analysis (disclosure, e-learning today and future e-learning).

Keywords
Moral reasoning, e-learning, generations, educational actors

1. Introduction

Moral behaviour is a *sine qua non* condition in education, although future educational environments enable a dramatic shift pertaining to "educational actors". That is, education 3.0 and 4.0 will include traditional (lecturers and learners) and non-traditional (non-human agents) "educational actors" (Costa, Silva and Fonseca, 2012). These novel "learning mediators" will promote unforeseen ethical and moral dilemmas, which e-learning literature seems to disregard. Against this backdrop, the paper explores e-learning implementation in Lusíada Universities (from 1.0 to 2.0- e.g., Silva, Rogerson and Stahl, 2010) as starting point to predict such ethical and moral dilemmas.

Hence, the authors aim to: (i) understand the ethical and social dilemmas posed in each e-learning generation to "individuals"; (ii) comprehend "individuals" (lecturers, learners and non-human agents) moral behaviour, as well as effects upon the ethical and social dilemmas; (ii) and, demonstrate how e-learning technologies shape the micro (individuals) and macro levels (educational institutions). For that, the paper is divided into three sections: guiding concepts (moral reasoning and e-learning); ethical and social dilemmas- evaluating e-learning (authors' argument and Stahl's framework); and, analysis (disclosure, e-learning today and future e-learning).

2. Guiding concepts

2.1 Moral reasoning

"Moral reasoning is individual or collective practical reasoning about what, morally, one ought to do" (Richardson, 2013). Practical reasoning recognises the importance of experience (neo-Kolberghian thesis), as well as a complex interaction among several elements to produce a moral intention (Frey, 2000). Therefore, moral reasoning unites moral intensity (moral imperative of a circumstance) and moral sensibility (cognitive process) (Jones, 1991). While moral reasoning involves a person; moral intelligence may invoke an artificial agent, which acknowledges the interaction among action, cognition, and spirituality in a non-human agent due to human-computer interaction (Panã, 2013).

2.2 E-learning

Definition

Literature illustrates a wide range of e-learning definitions, as for instance:

1. online delivery of information for purposes of education, training, or knowledge management, and is different from formal education, which occurs off campus, and usually, but not always, through online resources (distance learning) (Turban *et al.*, 2006);
2. ICT in higher education in order to engage students autonomous utilisation (Stahl, 2005);
3. Internet and other networks exploration to provide training through synchronous or asynchronous mode (Abram, 2003).

These definitions outline a formal scope of education, which enables four technological systems: Learning Management Systems (administrative tasks); Managed Learning Environment (learning and learning management procedures); Learning Content Management Systems (content management process); and, Virtual Learning Environments (educational actors interactions). However, novel and future educational mashups (e.g., Skype, social networks, PodCast, immersive learning games) challenge this paradigm in a continuum of thought (Wenmonth, 2006). Concluding, e-learning entails conceptual/physical components, formal/informal standards through a framework for co-operation amongst educational actors (authors' definition) and thrive autonomous learning.

Generations

Crump and Costea (2003) argue that learning technologies exist on a dynamic continuum; so, while education 1.0 resumes a static and non bidirectional communication amongst lecturers and learners (a traditional perspective of e-learning) (Reis, 2011); 2.0 refers to "interlocking set of open-source applications, where learning is becoming a creative activity (podcast, wikis, blogs, etc) and that the appropriate venue is a platform rather than an application" (Downes, 2005).

And, what is the future of learning environments? In spite of semantic web early-stage of development, e-learning 3.0 is becoming a reality. These learning environments provide contextual information and text, voice or images organisation throughout workflow tools as supporting infrastructure (Teten, 2007), i.e., artificial agents explore information or other sources (voice, image, etc.). Likewise, these non-human agents can provide recommendations regarding educational content based on users' preferences or settings, as well as in a near future deliver related content ("machine/agent" learning) and recognise anywhere (physical environment) lecturers or learners preferences (infuse in society) to promote transversal collaboration (Moravec, 2009).

Educational technologies 4.0 will have artificial intelligence in all applications (Turban *et al.*, 2010), although literature recognises a myriad of visions:

1. blend of human and non-human brain recognition, which will "download" skills and knowledge (post-human society) (Kurzweil, 2009);
2. total ubiquitous capabilities (knowledge repository of human civilisation), i.e., an aware and cognoscenti multidimensional network (joint human and artificial intelligence due to quantum computing) from which meta-knowledge (complex decision-making) will arise in order to progress be achievable (Tow, 2010);
3. haptic devices (unlike sensations that objects and interfaces provide to individuals) will permit communication among human and non-human agents (Kambil, 2008), as well as, a continuous exchange of our behavioural profiles and activities (Nash, 2008);
4. cognoscenti multidimensional network to promote complex decision making through ubiquitous wearable and haptic devices that update users behavioural profiles and experiential preferences (Spivack, 2007).

Despite the prior explanations is vital to compare each generation scheme (table 1) as well as technologies versus examples (table 2).

Table 1. E-learning generations vs. technological examples

	1.0	2.0	3.0	4.0*
Meaning is	Dictated	Socially constructed	Socially constructed and contextually reinvented	Socially constructed, contextually reinvented and experiential
Technology is	Selected	Cautiously adopted	Everywhere	Everywhere (systemic)
Lecturing is	L/S	L/S; S/S	L/S; L/AIA; S/S; S/L; S/AA	L/S; L/AA; S/S; S/L; S/AA; AA/L; AA/AA; AA/S
Classrooms location	Building	Building/online	Everywhere (infused society)	Everywhere (multidimensional society)
Lecturers are	Licensed experts	Licensed experts	Everybody	Everybody (including AIA)
Hardware and software	Proprietary and costly	Open source with low cost	Low cost and used purposively	Low cost, used purposively through individual demand
Companies view of learners	Industrial workers	Like 1.0, despite a knowledge economy	Co-workers or entrepreneurs	Co-entrepreneurs

Legend: L- Lecturer| S- Student| AA- Artificial Agent|* authors education 4.0 vision

Source: Adapted from Moravec (2009)

Table 2. E-learning generations vs. technological examples

E-learning generation	Technologies (standards)	Examples
1.0	HTTP, HTML, SOAP, XML, Java, Flash, etc	Content portals, websites, enterprise portals, databases, file servers, file sharing and search engines
2.0	P2P, RSS, AJAX, Open ID, ATOM, etc	Community portals, social bookmarks and networks, multi-user games, instant messaging, blogs and wikis
3.0	OWL, SPARKQL and SWRL	Intelligence agents, personal assistants, semantic web, semantic search, and knowledge bases
4.0	?*	cognoscenti multidimensional network, haptic interfaces, and mobile/ambient findability

Legend: * hitherto, literature about 4.0 generation does not recognise potential standards

Source: Adapted from Turban *et al.*, 2010

3. Ethical and social dilemmas: Evaluating e-learning!

3.1 Authors' argument

E-learning assessment literature is vast and investigates topics like information systems management, organisations, "educational actors", content, culture, ethics, communication, pedagogy and strategies. The majority of contemporary frameworks neglect a multidimensional analysis which moral reasoning and e-learning overlaps require; so, the authors acknowledge the work of Stahl (2002a).

3.2 Stahl's framework

Stahl's matrix exhibits three layers: micro-level (individuals); meso-level (e-learning project); macro-level (educational institutions). Yet, the author denotes that "the individual on the micro level is also part of meso level organizations, in this case of a university, and belongs to a macro level society or state" (Stahl, 2002b, pp.56).

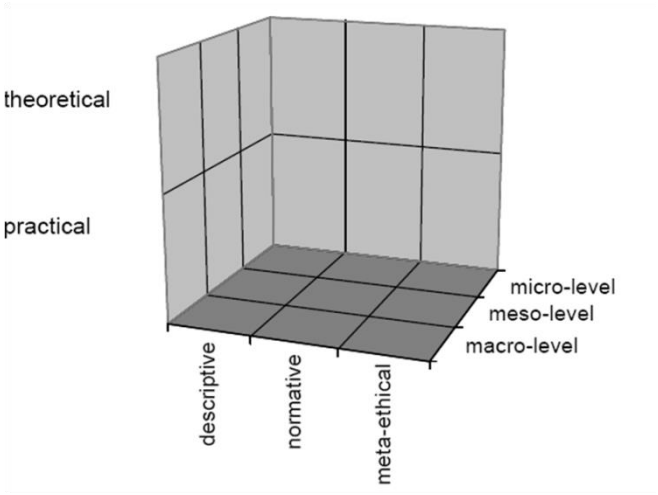

Figure 1. E-teaching framework Source: Stahl (2002, pp. 143)

In each layer two dimensions arise: (i) if the moral problem is theoretical or practical; and, ii) if the ethical relevant behaviour falls into a descriptive, normative or meta-ethical theory. Despite the interdependent relationship, namely between normative and descriptive ethics, Stahl (2002a) concludes that "fundamental problems of ethical research is that it always has a moral quality itself" (p. 141). Nevertheless, which ethical dilemmas require moral reasoning in digital learning environments? This author acknowledges cheating, intellectual property, plagiarism and copyright violations, privacy versus surveillance, personal data versus identity, integrity and honesty.

4. Analysis

4.1 Disclosure

Disclosure is the act or procedure of revealing or exposing, as well as, formulating a revelation (The Free Online Dictionary, 2013). That is, e-learning technologies shape Stahl's matrix (micro and macro levels) as Lusíada Universities empirical data demonstrate (see Table 3).

4.2 Today: E-learning at a glance

In order to debate moral reasoning in future learning environments, the authors explore Lusíada universities empirical data. The continuous utilisation of social media in Portugal and Angola denotes interesting differences as Table 4 denotes. Note that in Portuguese Lusíada social media is a key component for communication and learning, contrarily to Angola.

4.3 Outlook: The Future of e-learning

Future learning environments (3.0 and 4.0) comprise human (lecturers and learners) and non-human agents; so, these will reinvent the prior ethical dilemmas as the following queries denote:

1. Are the ethicultural challenges analogous in each e-learning generation? (query 1);
2. Assuming the non-human agent as knowledge creator, who belongs the intellectual property rights? (query 2);
3. Who is morally responsible for such knowledge? (query 3);
4. What is moral reasoning in these learning environments? (query 4).

Table 3. E-learning implementation in Lusíada Universities (1.0) versus Stahl's matrix

Levels	Actors	Examples	Reflection
Micro	Lecturers	Produce and introduce content simultaneously for Portuguese and Angolan learners	Is this content in accordance to both learners' characteristics? It is required ethicultural sensitivity?
	Learners	Academic integrity, namely regarding plagiarism, is more intense in Portuguese than in Angola learners	In Angola technological infrastructure is not totally available, contrarily to what happens in Portugal. As a consequence, Angolan learners have less means to access to "controlled documents" (thus respecting plagiarism, copyright and intellectual property rights)? Does this fact justify a distinct moral intensity about academic integrity?
Macro	Educational institution	Institutional accreditation (Bologna Process) concerning delivered content. This content should be shared by Portugal and Angola campuses (e-learning)	In Portugal, e-learning technologies have been supported by European Union financial programs (Bologna Process). However, in Angola it resumes a continuous internal investment by the University. In addition, Lusíada University (shared name) resumes a Janus assumption: in Portugal it is a foundation; and, in Angola it is a profitable organization. Does this organizational antagonism imply unlike social responsibility?

Source: Adapted from Silva *et al.*, 2011

Table 4. E-learning 2.0 implementation in Lusíada Universities

Levels	Actors	Examples	Reflection
Micro	Lecturers	Portuguese lecturers interact with learners, although without introduce content (organisational policy), while in Angola lecturers create Lusíada Facebook pages (absence of organisational policy) with non-authorised content (copyright and intellectual property violation)	How to improve Angolan lecturers' moral decision making?
	Learners	In Angola is common to have false learners groups or Facebook pages (identity issues), as well as containing information that violates copyright and intellectual property (e.g., books)	Academic integrity is more intense in Portugal. How to change the status quo and improve learners' moral decision making?

Source: Authors

Query 1: ethicultural sensitivity

Panã (in press) argues that non-human moral intelligence can provide a basis for cultural abilities, since acknowledge a compliance with norms and values. If future learning environments embrace simultaneously a physical and virtual relationship with individuals through haptic devices; then, is reasonable to claim that intelligence is distributed across the social, natural, cultural and technological environment ("glocal memory") (Goertzel, 2008). However, is the authors' belief that ethicultural sensitivity will continue to be a wishful thinking because if a system will learn and evolve with individuals' utilisation, a non-ethicultural human user will shape a non-ethicultural agent despite memetic computing development. Memetic computing is an attempt to capture the biological-cultural combination and optimisation in non-human agents (Emergent Technologies Task Force on Memetic Computing, 2010), i.e., ethicultural sensitivity in non-human agents.

Query 2: intellectual property rights

With "fully" cognoscenti non-human agents that produce knowledge according to our behavioural profiles and activities (Nash, 2008) or emotional states (Spivack, 2007), the human perception of creativity and ownership will be tremendously reshaped. In spite this assumption is a fuzzy debate due to:

- autonomic learning- inner mechanism of self-directed learning that resumes learners' attitudes, competences and learning strategies (Wang and Li, 2007);
- autonomic non-human learning- systems that now themselves or ought to create self-knowledge (Cofino *et al.*, 2003).

If knowledge can be produced by a human or non-human agent what will be the outcome? Presuming autonomic human learning, how users and knowledge "owners" of these technologies will balance their contribution? In case of autonomic non-human learning, who belongs intellectual property rights? To humans, that assume a "pastoral care" relationship or, to the autopoietic non-human agent... This legal quandary is also challenged by devirtualisation (immersive learning environments): extensions of our "self" and knowledge that configure multiple methodological and ontological perceptions (Baofu, 2008) which is related to informational existentialism (Costa and Silva, 2010).

Query 3: moral responsibility

From the previous queries, it is possible to debate the moral responsibility. Its theoretical ground acknowledge intellectual property rights legal subjectivity (Gutwirth and Hert, 2006), since a non-human agent own actions continue to illustrate difficulties about copyright law. In fact, their polymorphic behaviour leads to unpredictable outcomes which even hurdles the legal and moral analysis (Shoyama, 2005). Hence, two arguments exclude non-human agents as "knowledge creators" (Groom, 2004): (i) technological exclusion, defined as design measures to prevent or restrain copyright or related rights; (ii) contractual exclusion, internet structure facilitates contractual interactions in a variety of ways, as for instance immediate communication regarding agreement terms and conditions.

Query 4: moral reasoning

Himma (2009) refers two conditions for moral agency: free choice (rational agent); and, the agent ought to understand the consequences of its actions. The issue of conscience within non-human agents assumes a traditional anthropocentric conception (Floridi and Sanders, 2004), despite do not possess functional consciousness (Torrance, 2008). Although these non-human agents produce moral dangers, which presume to ascribe moral reasoning through a positive retort to three queries (Sullins, 2006): (i) are non-human agents considerably autonomous?; (ii) what is the meaning of intentional behaviour in such agents?; (iii) are these morally responsible, or not?

Traditionally, autonomy acknowledges a condition or state regarding self-government and self-determination; although, it remains unclear if individuals value equally autonomy (Christman, 2011). The complex interaction among both entities will produce unforeseen results in a certain context, as well as is virtually impossible to ignore that such non-human agents' autonomy depends on external information and design constraints (Gotterbarn, 2010). From the above assumptions it is reasonable to refer that a non-human agent simply entail moral agency, since

"quasi-responsibility indicates that the speaker intends to use the idea of a social construction for the purpose of ascribing a subject to an object with the aim of attributing sanctions (the heart of responsibility) without regard to the question whether the subject fulfils the traditional conditions of responsibility" (Stahl, 2006, pp. 210).

Discussion and conclusion

E-learning evolution is a current topic within literature, although the novel dilemmas that future learning environments will pose has been neglected as this paper denotes. From the analysis is possible to argue that education 3.0 and 4.0 will produce intricate quandaries regarding moral reasoning, since old ethical issues continue and novel ones arise.

Probably the most relevant is the interaction among both entities, because it is feasible to question if an unmoral person may influence negatively the autopoietic non-human agent despite its capabilities to evolve. In case of a positive answer the ethical dilemmas will proliferate; if not, a behavioural change is possible? Hitherto the retort is blurry, although the concept of moral exemplar may provide important clues. A moral exemplar is an individual that achieve continued successful performance through ethical behaviour (Huff and Barnard, 2009), so a moral lecturer or learner may induce a positive influence over the non-human agent.

In spite of be complex and uncertain to predict learning environments features, is the authors believe that education 5.0 will reshape the following idea: "*localitas* (as a necessary quality of bodies), *connectivitas* (fusion status about multi-glocal experiences), and *humanitas* (capacity for self-consciousness, self-exploration, and self-determination as the Roman philosopher Cicero describes) (Silva, Alvarez and Rogerson, 2011, pp. 148)". I.e., *localitas* will merge the concept of "self" and "digital self"; and, *connectivitas* will incorporate learners distributed experiences due to systemic and immersive environments.

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DEVELOPING ROBUST CAD CURRICULUM BY APPLYING BLENDED LEARNING ENVIRONMENT AND TECHNOLOGY

Richard Cozzens

Abstract

The drafting and design world has undergone and continues to undergo drastic technological changes. These changes have had a huge effect on technology and engineering education. The course objectives and assessments at the state and national level has been a subject of discussion for several years as a result of the fast paced changes in technology and how it is reshaping the industry. At ETHICOMP2008, I discussed the feasibility of Web-Based Training. The research conducted indicated that web-based CAD training was a feasible method of training given the training had the right components. At ETHICOMP2010, I discussed the quality of Web-Based Training. In the paper, it was mentioned that web-based CAD training would never completely replace face-to-face training but could be used as supplement and in some cases be a viable substitute. At ETHICOMP2011, I explored social media for disseminating training. This background has provided me with a strong foundation to help guide a state grant in developing a robust CAD Curriculum applying Blended Learning Techniques and the latest technology. In this paper I will present a collaborative project between the state of Utah System of Higher Education (USHE) and Utah State Office of Education Districts (USOE) to develop a new approach to presenting and teaching an old subject engineering and technology as it applies to Computer Aided Design (CAD). In the paper I will present the proposed curriculum and the project curriculum development team. I will also explain the role of the flipped classroom blended learning and how web-based technology is being used to provide teaching and learning opportunities at multiple levels. I will also explain how this curriculum because of the technology can be used as a stand-alone web-based course, hybrid course or a supplement to a regular face to face class. After the grant requirements are discussed there will be a section covering the lessons learned since the curriculum development phase is 2/3 complete. Then a short summary will close this paper out.

Keywords

CAD, Blended Learning, Web-Based Curriculum

1. The Problem

The first problem: The technology used to generate mechanical drawings has evolved significantly in the last few years. The use of CAD software not only provides fast and efficient tools to generate these mechanical drawings and designs but provides tools for design review and evaluation. The designer of today must understand the design intent and constraint requirements of the part and/or assembly being created and/or designed. It is critical that these concepts be incorporated into the existing drafting and design course without neglecting the fundamental concepts traditionally taught in this type of course. Time in the classroom remains constant but the content has increased to include the use of software and in many cases multiple software packages. Although the technology has evolved significantly, the fundamental principles of drafting and design have not changed. The state of Utah education system at the high school and college/university level has been struggling with this issue for several years. In addition to this problem engineering and design curriculum has been taught the same way for years using memorization and providing a solution before the student even understood what the questions was. It has been stated that learning really doesn't take place until a question is posed. Blooms Taxonomy states that the lowest level of learning is memorization. One of the highest level of learning is application and evaluation. The traditional method of teaching engineering and design is more a method of memorization with limited application. The traditional method had very little evaluation type exercises. Newer methods of teaching this type of curriculum

pose questions. The questions provide the student with a purpose to learn the information. It is a method of engaging the student. An example of this is Project Lead the Way. PLW curriculum almost always poses a question prior to any lesson. These questions provide the student with a need to know. The state of Utah's engineering and design/drafting curriculum has had small updates to attempt to meet the changes in technology but it has not been enough. The methodology has not been updated or standardized at all.

The second problem: Students learn at different rates using different methods of learning. Dr. Avi Wiezels has structured his classes in attempt to solve a problem that Folkestad and De Miranda has referenced when they stated "Furthermore, each student has their own pace of learning making it difficult to teach CAD related technologies in a stand-and-deliver format, where some students excel and subsequently are waiting on the instructor, and those that lag behind and may never grasp the intended learning objectives." Dr. Wiezels CAD class for Construction Management Majors at Arizona State University was experiencing similar challenges in keeping the students fully engaged and learning.

2. The Solution

The Utah System of Higher Education (USHE) opened up grant proposals from USHE faculty to create a hybrid course that satisfy General Education requirements for high demand Career and Technical Education (CTE) courses such as engineering and technical design (this includes CAD). The idea is that these courses could be used for Concurrent Enrollment (CE) credit so students in the public education system (high schools) could get college credit for taking this class. A team of USHE faculty members from across the state applied for this grant. This team is referred to in this paper as the TICE Team. In August of 2012 the TICE Team proposal was awarded the grant. The course being developed by the TICE Team is named "Introduction to Engineering and Technical Design".

The grant is not the solution, it is merely the vehicle needed to apply the solutions developed by TICE team. The following section headings are the grant requirements. Below each of the requirements is an explanation to the TICE teams solution to meeting and in some cases exceeding the requirements. These solutions are what makes this curriculum unique and robust compared to the more traditional engineering and technical design curriculum

Dr. Wiezels solution to the second stated problem was to implement blended learning using the following format. All of Dr. Wiezels lectures were accessible online (via e-learning tools and YouTube). The students would come to class watch the lectures on video. It was robust because they could work at their own speed. If they did not understand a concept they could replay the video portion over and over again. For students that learned better from reading, the book was available online as a PDF format. The advanced students were able to complete the homework and leave early. This cleared his time and attention to the students that were struggling. In many cases he still lectured on the subject but was able to adjust and customize the lecture to the struggling students through formative/process assessment. I was able to observe this first hand and have attempted to implement into my courses ever since that experience. It was important to me to implement this flexibility into this project.

3. The Utah Technology Intensive Concurrent Enrollment (TICE) Project

What is TICE (Technology Intensive Concurrent Enrollment)? The Utah Education Network (UEN) website best defines it in the following description. "Technology Intensive Concurrent Enrollment (TICE) is a collaborative program sponsored by the Utah System of Higher Education (USHE) and the Utah System of Education (USOE). TICE courses are "technology intensive" meaning they are designed as a hybrid blend of teaching and learning activities that take place in class and online. They are also "concurrent enrollment" so qualified high school juniors and seniors may enroll and earn credit in one of the institutions in the Utah System of High Education (USHE) as well as meet graduation requirements from their high school."

For this purpose the Curriculum Development Team (TICE Team) was composed of selected professors and instructors from across the state to create a web-based book (PDF and/or eBook) that teaches the principles of drafting and design at the process level to promote curriculum acceptance and implementation from K-12 to Post-Secondary Education. This will provide a method for every school in the state to use the same book and objectives, and achieve the same outcomes for all CE classes accepted by every state college/university. This will provide the link to a higher educational path for high school students wanting to enter a career in an engineering profession early in their education regardless of their geographic location. Given that this book focused on the process level, it can be used without going out of date. The components in each lesson have applied techniques that can be applied to any CAD software and any version (release) of that software. The book will be accessible through Canvas (classroom management system similar to Blackboard) as an online course delivery tool. The entire course is being developed around the state objectives for both the pre-engineering and drafting technology programs.

The course description for the "Introduction to Engineering and Technical Design" is: An introductory course to explore engineering technology and technical design solutions using critical thinking in Science, Technology, Engineering & Mathematics (STEM). Includes: Design Professions & Teams using the Engineering Design Process; Documenting the Design Process through Sketching & the Engineering Notebook; Design Measuring; Geometric Construction & Computer Aided Design (CAD); Design Visualization; Multi-view Drawings; Fasteners; Assembly Drawings; Dimensioning; Tolerancing; and Presentation of a Final Team Design Project .

The Course Outcomes are:

- Upon successful completion students will be able to:

1. Understand the role of design in society, related professions and the engineering design process.
2. Understand and apply mathematics, measuring conventions and scales using scale factors.
3. Develop the ability to visualize a design solution in 2D and 3D as well as manipulate it.
4. Document the design process and apply drawing standards in solving technological problems.
5. Understand and demonstrate the use of geometric and numeric construction constraints.
6. Understand and develop multi view drawings that include all necessary views.
7. Fully describe the size, shape, location, and manufacturing required to produce a part.
8. Fully define the allowable variation of the geometric size, shape, location, and manufacturing required to produce a part.
9. Document a full assembly to completely describe each part to be manufactured.

The Course Modules are:

1. Design Professions & Teams Using the Engineering Design Process
2. Documenting the Design Process through Sketching & the Engineering Notebook
3. Design Measuring
4. Geometric Construction & CAD
5. Design Visualization
6. Multi-View Drawings
7. Fasteners
8. Assembly Drawings
9. Dimensioning
10. Tolerancing
11. Final Team Design Project
12. Supplemental Resources

3.1 TICE Grant RFP Criteria 1

Names and institutional affiliations of the course design team members.

	Name	Title	Institution
1	Richard Cozzens (Grant Director)	Professional in Residence	Southern Utah University
2	Jeremy Farner	Professor	Weber State University
3	Howard Bezzant	Professor	Utah Valley University
4	Elias Perez	Professor	Utah State University Eastern
5	Michael Stenquist	Instructor	Salt Lake Community College
6	Rex Thornock	Instructor	Ogden-Weber Tech College
7	Tim Feltner	Instructor	Layton High School
8	Dr. Thomas Paskett	Instructor	Fremont High School
9	Gary Roberts	Instructor	Wasatch High School

Pedagogy & Assessment Advisor:

Shalini Kesar (Assistant Professor) Southern Utah University

Technology and Curriculum Development Software Advisor:

Isabella Borisova (Instructor) Southern Utah University

Advisory Members:

Dave Milliken: Utah State Skilled and Technical Sciences Education Specialist

Darrell Andelin: Utah State Technology & Engineering Education Specialist

3.2 TICE Grant RFP Criteria 2

Requirement: Proposal narrative describing the course learning objectives, articulation with a corresponding USOE course, course design methodology, course activities, materials and resources to be used by students and instructors, along with a description of how these will be incorporated into the Instructure CANVAS learning management system.

All the USHE institutions and UOSE Districts use a variety of different software to teach the Fundamental Drafting class. For this purpose the Curriculum Development Team proposes to create a web-based book (PDF and/or eBook) that teaches the principles of drafting and design at the process level. This book would not address any specific CAD software. This will provide a method for every school to use the same book. Given that this book focuses on the process level it can be used without going out of date. The components in each lesson can be applied to any CAD software and any version (release) of that software. The book will be accessible through Canvas.

The entire course will be developed around the stated objectives. Most of the objectives will be covered in the form of a chapter in the book (module in Canvas). Each chapter will have the following supplemental component:

- Chapters - The components of each chapter are listed in the section below.
- Power Point Presentation - The instructor can use this for lecture purposes. The student could use it for quick review.
- Video of the process and principles presented in the module. - The video can be used in place of or as a supplement to the class lecture. Provides the ability to expand this course offering to smaller rural schools where certifications are a challenge.
- Samples of the application - This will provide the instructor with samples of the application of the principles being taught. This will provide the student and understanding of why this principle is important to know and understand and how it fits into the overall scope of the course.

- CAD Software Video - There will be a basic video presenting the principles being presented in the chapter for each of the following CAD software packages (AutoCAD, Inventor, Solidworks and Creo). Note: This is the only part of the curriculum that will be somewhat dependent on the CAD software and version level. This will be basic instruction using Camtasia (screen capture software). These videos will not be produced professionally to save cost. We believe our team has the expertise to produce quality videos.
- Project - Several projects will be provided for each lesson. This will provide an opportunity for the student to apply the knowledge presented in the chapter to solving a related project problem. This component will is critical to meeting the objectives listed for the Engineering Design course objectives.
- Daily Quizzes - These quizzes can be used for quick review of the material covered in the previous lecture and/or assignment. These quizzes will consist of one to four questions taken from the chapter exercises. As with every other component the quizzes will be available through Canvas.
- Knowledge Assessment - This will provide the student the opportunity to demonstrate his/her mastery of the chapter. This assessment will be created in Canvas using a variation of question types. This method will provide immediate feedback to the student and efficient grading and assessment information for the instructor.
- Application Assessment - This will provide an opportunity for the student to apply the knowledge to solve a problem similar to what they could experience in industry. It is meant to simulate a real work place situation. Scoring rubrics will be provided to help provide feedback to the student and help the instructor grade consistently.
- Supplemental Information for the instructor - One of the main objectives for this course is to make the curriculum instructor friendly and ready to go. Most of the high school instructors have several different classes they are required to teach. They have limited time and resources to develop curriculum. Providing these resources will also help keep the class standard across the state.

Components of each chapter:

- Introduction
- Objectives
- Key Terms and Definitions
- Background information (as required)
- Graphically rich step by Step instructions.
- Practice Exercises to re-enforce the principles taught.
- Questions to test knowledge of subject.
- Project to provide the student the opportunity to apply the knowledge to solving a problem.
- Knowledge assessment (tied directly to the objectives)
- Application assessment (tied directly to the objectives)

We will incorporate the chapter format that Southern Utah University has been using for their successful CAD publications for 10+ years.

The TICE team members believe that we can teach the underlying basic principles of drafting in generic terms and then supply some supplemental training specific to each CAD software. This approach treats the specific CAD software as just a tool to learn the process so the student can solve the problem much like a calculator is to math (just a tool, it does not matter if it is a Casio or an HP). The knowledge and application assessments will be process based not based on a specific software. This will provide some freedom or variety between the USHE programs attempting to supply students that are more specific to a certain industry. The TICE team sees this proposal as an opportunity to help solve this problem.

Summary of project objectives:

1. Create a standard yet innovative curriculum and assessment for the "Introduction to Engineering and Technical Design" course by sharing existing knowledge and resources while developing new curriculum and applying new methods of delivery.
2. Join resources and knowledge from the drafting portion of Skilled and Technical Science Education (USOE) with the drafting portion of Technology and Engineering Education (USOE) to enhance the students' career options while strengthening USHE and USOE technology and Engineering programs.
3. Develop the curriculum in such manner that math credit can be given for this class.
4. Change the course number and title to match for all USHE institutions.
5. Strengthen working relationships and improve overall knowledge and skill across the state.
6. Provide an opportunity to reach out to smaller rural schools via hybrid and web-based tools.

3.3 TICE Grant RFP Criteria 3

Requirement: Description of the common assessment of core learning outcomes and how the results will be transmitted to USHE for publication on the TICE web site.

The course numbers and title will be changed so it will be the same at all USHE Institutions (Southern Utah University, Weber State University, Utah Valley University, Salt Lake Community College and Utah State University –Eastern). The course number will be 1010 and the course title will be "Introduction to Engineering and Technical Design". The Tice Team will develop the common course (final) assessment based on the course objectives and learning outcomes. This assessment will be used by all the USHE institutions and USOE districts. The learning outcomes listed below are a combination of the Technical Design 1 course, Engineering Design course, Introduction to Engineering Design course (Project Lead the Way) and American Board for Engineering and Technology (ABET) guidelines for technology programs. Learning Outcomes by Chapter (module):

1. Communication using Graphics
2. Design Visualization
3. Sketching and Text
4. Scales and Scale Factors
5. Engineering Geometry
6. Geometric Relationships
7. 3D Modeling
8. Multi-view Drawings
9. Orthographic Projection
10. Isometric Projection
11. Section Views
12. Auxiliary Views
13. Fastening
14. Dimensioning
15. Tolerances
16. Assemblies & Bill of Materials
17. Working Drawings from Assembly

3.4 TICE Grant RFP Criteria 4

Requirement: Description of the level of commitment from faculty and institutions to offer the TICE course (names of instructors, with tentative numbers of sections and projected numbers of students) for CE and/or regular credit in the first year.

All institutions and faculty members involved in this project have a long history of demonstrating support of the high school drafting and design programs such as CE, UACTE and Skills USA. We used numbers supplied by the USHE representative. It was approximated about 430 students could be effected by this course. From the numbers that have been received the class sizes range from 5 to 35. The average class size seems to be about 17.

The current numbers reflect only the credit being given for the Skilled and Technical Science Education program. As mentioned incorporating the Technology and Engineering Education program could possibly double the number of students impacted. This is a high impact course.

3.5 TICE Grant RFP Criteria 5

Requirement: Description of professional development activities planned for teachers and faculty wanting to offer the course.

Professional Development will be provided at three different levels.

1. The first level is at the state level. Every year UACTE hosts the Mid-Winter Conference and the Summer Conference. We have already received permission to use both of these conferences to present and train the teachers on this newly developed curriculum. This is an existing conference that the teachers are required to attend. Certification and upper division credit will be provided by Southern Utah University and Weber State University for those that chose to get credit for the training.
2. The second level of training will be provided to the individual or collective schools/instructors by the college or university offering the concurrent credit. This will be managed by the controlling college or university. The school and the instructor will have to meet the qualifications required by the controlling college or university.
3. The third level of training will be a web-based introduction to the course with supplemental information hosted on appropriate Utah State of Education CTE website http://www.schools.utah.gov/cte/sts.html .

3.6 TICE Grant RFP Criteria 6

Requirement: A Timeline for course development activities and delivery.

August 1st Start of Grant

August 6th-9th 2012: TICE Team Workshop I. This work shop will be held on the campus of Southern Utah University in the Engineering and Technology Building Room 120. This workshop will cover the following topics:

- Dr. Shalini Kesar will review the following subjects with the team members; Pedagogy & assessment. The objective of this training is to review the best practices so we as a team can implement the best practices into the curriculum. This will also help us to be more consistent in our curriculum development even though each team member will be taking individual lessons.
- Ms. Isabella Borisova will train the team members on advanced software applications needed to develop the course curriculum. This initially will include MS Word, Adobe Acrobat Pro, Camtasia, Snag It and Canvas.

Friday, October 26th 2012: TICE Team Workshop II. TICE Team will meet at Utah Valley University to review and share the developed curriculum. Skype conference calls can save a lot of travel but it is limited and there will be need for some face to face meetings and possibly additional training.

February 2013 UATCE mid- Winter Conference: We will meet as a team all day Friday and then give a preview training to the other high school teachers on Saturday's workshops.

June 2012 (Summer UACTE Conference): Present the newly developed curriculum to the high schools at the summer conference (three days).

Fall Semester 2013: Each USHE institution, college, department and Curriculum Develop Team Member will take responsibility for implementing the concurrent curriculum into the high schools within their boundary.

3.7 TICE Grant RFP Criteria 7

Requirement: Detailed budget showing all planned categories of expenses, including a budget justification narrative. There are no specific limits on the amount of support that can be requested; however, proposals that minimize costs by taking maximum advantage of existing resources will be given priority for funding.

To keep the budget as simple to manage as possible the travel and miscellaneous expenders will be rolled into the individual team member payment. Each team member will be paid as an outside contractor. Each team member will be paid in three separate payments. The first payment will be at the beginning of the project. Second payment will be mid project. The final payment will be made on completion of the project. These payments per team member may have to be adjusted according to the amount of work completed. It is inevitable that some work will have to be shifted. The amount of the payments will be adjusted to the amount of work complete at an acceptable level of quality. The acceptable level of quality means that it is approved by the review committee. The scope of work right now looks like 1.6 chapters per team member to develop and review.

Dr. Shalini Kesar, a professor at Southern Utah University and an expert in pedagogy & assessment methods will provide training to the team members in the first workshop. Dr. Kesar will also advise the team members throughout the project as required.

Ms. Isabella Borisova, an instructor at Southern Utah University will provide training for the team members on online and web-based technology. Isabella will also consult and support the web-based development throughout the duration of the project. With the help of Ms. Borisova we will develop and produce our own training video. Since this project will require a significant amount of video this will be a huge cost savings to the project.

Although the bulk of the developed curriculum will be developed and uploaded to Canvas by the assigned team member some of the more routine work will be handled by a student worker as shown on the budget.

Computer and other hardware/software costs will be considered the institutional match. The only software purchase requested is the software required to create the video, publish the eBook and professional version of Skype so that the team members can conference call, share screens and documents.

The director and co-director will have full responsibility to make sure the project is successfully completed.

4. Current Status and Future Schedule

The TICE Team is eight and a half months into the project and we have completed seven one and a half day workshops. The workshops have been used to train each other on pedagogy, assessment, documentation, software as well as fine tune the modules, module objectives and measurable outcomes. The TICE Team has two additional workshops scheduled to complete, review and critique the complete curriculum. June 18th, 19th and 20th the team is scheduled to train the state

skilled/technical and pre-engineering high school teachers on the new curriculum. The state will have six selected programs test the curriculum as a pilot program in the Fall Semester of 2013. If all goes as planned the curriculum will be completely integrated in the Spring Semester of 2014.

5. Lessons Learned

I believe I had an advantage heading into this project because the experience I have had publishing my books and developing my web-based CAD training site. I have had years of research on the topic of web-based CAD curriculum development as pointed out in the abstract and reference section of this paper. I have been applying Argyris's theory of double loop learning to my courses for the past several years. All this experience has proven to be critical. I was better able to estimate the actual time required to develop the original document and videos. I was able to contribute to the standardization and of the processes and document formatting in all of our workshops.

With this said there are numerous things that I still had to learn, they are listed below:

1. Technology is a wonderful tool but you always need a backup plan. We have had several Skype Conference calls and numerous Adobe Connect Conference calls. When the technology worked it was amazing but almost every time there were several problems to solve prior to taking care of business. It turned out that face to face workshops were necessary at least every six weeks. We could fill in the rest with conference calls. This could be applied to web-based training. When communicating face to face conversation allows all the senses to be involved.
2. Articulating and agreeing on the modules, objectives and outcomes. I naively thought we could this hammered out in one two day workshop. Seven workshops later we are still fine tuning these points. This has taken more time than creating the documents themselves. Again, this is where double loop learning and action research has been valuable (it is a refining process).
3. Everything takes longer that originally estimated. I knew this at the beginning but I appreciate the fact even more now.
4. The time and energy it takes to manage personnel. This is not really related to this paper but still a critical issue.
5. As Jim Collins stated in his book "…first got the right people on the bus (and the wrong people off the bus) and then figured out where to drive it." The talented and motivated team members I just got out of the way and luckily this was most of the team. I specifically selected talented and motivated instructors and professors but with diverse points of view. This created a lot of lively debate but we are ending up with a better product because every idea was tried and critiqued.
6. Spending a day and a half every two weeks with a talented and motivated team has been invaluable to my education. Each TICE Team member has his/her own set of skills, talents and knowledge. Each workshop has been a learning adventure.

6. Summary

According to my previous research and the research of others this curriculum has the necessary components to be robust. The curriculum (if necessary) could be used as a stand-alone web-based course for motivated students in remote rural schools. The same curriculum could be used in a blended learning environment or flipped class room environment. The curriculum could be used as a supplement to traditional face to face lecture as well. This alone by definition would make the curriculum robust.

The fact that the curriculum is self-contained makes it robust. No outside publisher, supplier or assessment company controls the cost or application of the curriculum.

The fact that it allows the schools to select its own CAD software makes the curriculum cutting edge, unique and truly robust.

The fact that it uses all the latest technology in disseminating the information (Canvas, Adobe Acrobat, U3D, Camtasia, Power Point Presentation just to name a few) makes it robust. As L.M. Kamp stated about the short comings of e-learning in engineering education these things do not guarantee its success or acceptance "The project did not grow into a standard part of the engineering education as expected. The autonomy of faculties and educational changes prevented diffusion." In the end only time and trial will tell if this curriculum is truly robust. If the teachers use it and the students learn that will be the ultimate test.

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INFORMAL COMMUNICATIVE PRACTICES IN FORMAL SETTINGS: FACEBOOK AS MEDIATOR BETWEEN CONTEXTS

Nina Bonderup Dohn and Niels Bonderup Dohn

Abstract
The research question for this paper is: How do formal and informal practices interact to create tensions and possibilities for communication when Facebook is engaged as a platform for learning? The question was investigated through a study of student experiences in three different naturalistic setups. The results show that the affordances of Facebook, coupled with its pervasiveness and familiarity, offer new learning possibilities. However, ethical issues arise concerning privacy, surveillance, and indirect pressure to participate on a commercial platform. In addition, the very everydayness of Facebook appears to lead to a certain depreciation of the educational activities.

Keywords
Facebook, learning possibilities, informal, formal, communication, ethics

1. Introduction

Facebook is immensely popular, not least among young people. In Denmark, where the study to be reported here took place, 88 % of the 16-19 year-olds and 75% of the 20-39 year-olds had a Facebook profile in 2010 (Statistics Denmark, 2010). The prevalence of the platform has increasingly stimulated educators to wonder whether the motivation and communicative skills at play here might be 'harnessed' in the service of educational programs (Ajjan & Hartshorne, 2008; Aydin, 2012; Lampe, Wohn, Vitak, Ellison, & Wash, 2011; Mazman & Usluel, 2010). On the face of it, one would expect students to find it easier and more motivating to communicate about learning issues if they involved Facebook activities because of their familiarity with the platform's communicative practices. In addition, one might hypothesize that the forging of connections between school subjects and student out-of-school interests might be facilitated, given the ease with which students via Facebook remediate content across virtual contexts.

On the other hand, it might be argued that introducing Facebook activities into educational settings places unclear demands on the students (Dohn, 2009) because Facebook's informal communicative practices do not fit the implicit and explicit norms of education. Likewise, the enrolment into school's more formal settings of a sphere in the students' lives which is paradigmatically off-school and out-of-bonds for teachers arguably amounts to a breach of privacy for the students.

These considerations point out a question in need of investigation, namely:

Research question: How do formal and informal practices interact to create tensions and possibilities for communication when Facebook is engaged as a platform for learning?

2. Method

To investigate this question, a study has been conducted of student experiences in three different naturalistic setups where Facebook was utilized as a platform for learning. The three setups were undertaken with different age groups, at different educational levels, in different school subjects and with different learning objectives. Thus, Flyvbjerg's criterion of "maximal variation" in the information oriented selection of cases has been used in the choice of settings in which to initiate the setups (Flyvbjerg, 2006). The diversity in educational settings make all the more significant the similarities we note in tensions and possibilities experienced by the students.

The three educational settings ('cases 1-3') were:

1. A Year 10 biology class (N=30) in upper secondary school ("gymnasiet"), students aged 16-18. The intention of the teacher was to supply a forum for discussing ethical and societal questions in relation to biology, not least through student initiated postings inspired by out-of-school contexts.
2. A Teacher Education class (N=23) in practicum as biology teachers, students aged 20-35. The intention of the teacher was to supply a platform for guidance and discussion to help the students link theory and practice, especially concerning pedagogical and biological issues that arose for them in their practicum.
3. A Year 10 Danish class (N=25) in lower secondary school ("10. klasse")[1], students aged 16-17. The intention of the teacher was to focus on the genres, styles, rhetoric strategies etc. at play in Facebook chat and update messages.

Case 1 was used as exploratory case and the data were generated in an iterative manner. Thus, classroom observation and analysis of the Facebook site formed the basis for the formulation of a semi-structured interview guide to investigate the research question. On the basis of 5 semi-structured interviews a questionnaire was constructed which was answered by all students. The closed statement items were scored on a 7-point Likert-type scale ranging from 7 (agree) to 1 (disagree). In addition, there were 3 open questions concerning a) positive and b) negative aspects of using Facebook in the biology class and c) further comments.

Students in cases 2 and 3 were treated to the same questionnaire with appropriate adjustments, e.g. substituting "biology" with "Danish" in case 3, and "concepts in biology" with "concepts in biology teaching" in case 2. This setup made it possible to investigate whether the findings of case 1 concerning tensions and possibilities for communication had their counterparts in cases 2 and 3. The questionnaires were filled out by 27 students in case 1, 15 students in case 2, and 22 students in case 3.

The interviews (case 1) and open ended questions of the questionnaires (all three cases) were coded independently by the two authors with codes highlighting answers to the research question. The codes were affordances for participation, constraints on participation, interaction of formal and informal contexts, interest, subject content, surveillance, and ownership. The authors compared and discussed coding after each coding session. The contradictory findings (less than 13%) were negotiated and re-coded until a unified opinion was reached.

The analysis of questionnaire data included descriptive statistics (mean scores and standard deviations). The reliability coefficient (Cronbach alpha) of the questionnaire was calculated to be 0.83 (case 1), 0.72 (case 2), and 0.72 (case 3) which is acceptable given that the questionnaire was distributed for the first time (Cronbach, 1990).

3. Results

The most general result across the three cases is that the employment of Facebook as a platform for learning is not straightforwardly a good or bad idea, nor is it experienced unequivocally as such by the students. Instead, students, often individually and definitely as a group, report both positive and negative ways in which the interaction of formal and informal practices influence their communication about and understanding of subject-related matters. The divergence in views is clear from large standard deviations on many quantitative items and from differences in answers to the open-ended questions.

Across all three cases, the students view the Facebook activities as schoolwork, though at least some of them think of the activities as different – "more fun", "less serious" (qualitative statements from cases 1 and 3 and from cases 1, 2 and 3, respectively) – from other assignments. Qualitative answers

[1] The Danish school system comprises 9 years of compulsory school after which students choose whether to continue in one of three types of upper secondary schools; to take another year (10. klasse) in a lower secondary school or to quit school altogether.

range from “It gets something of our everyday into the lessons” and “Facebook is just so close to our everyday so it is easier for us to engage in the task” to “Facebook becomes more ‘school-like’ and not fun if it is part of the lessons” and “It was a little boring and not more fun just because it is a webpage we often use” (all statements from case 3). Quantitatively, student views of the Facebook activities as schoolwork are measured by the items in Table 1.

Table 1. Student views on the school-likeness of the Facebook activities. 7 point Likert-type scale.

Item	Case1: Mean (SD)	Case2: Mean (SD)	Case3: Mean (SD)
Home-/schoolwork	4.85 (2.31)	4.07 (2.40)	4.59 (2.15)
is school	5.31 (1.85)	4.40 (2.31)	N/A
makes Facebook school	3.88 (2.12)	4.13 (2.23)	3.45 (1.97)
makes [subject] less school-like	3.88 (2.05)	4.47 (1.45)	4.77 (1.71)

3.1 Possibilities for communication

Affordances of Facebook as a platform for learning. In all three cases very many answers (44 in case 1, 38 in case 2, and 13 in case 3) to the open-ended item “what did you find positive about using Facebook for [specifies the educational activity/setting]?” concern ways in which Facebook as a communication platform supports student activities. Access to other students’ entries and the comments they lead to from the teacher and fellow students; dialogue; upload and sharing of content are frequently mentioned aspects. Facebook’s user-friendly interface and easy-to-use functionalities such as “easy upload”, “easy to comment”, “convenient overview over information”, and availability on mobile apps are cited as platform focused reasons for the support of these activities. In addition, many students mention their familiarity with the platform and its communication practices from their out-of-school lives as conducive to participation and communication. Some answers specifically indicate that the availability of educational communication on the students’ ‘everyday platform’ served to increase the conspicuousness of assignments and discussions.

Coupling of informal and formal contexts. Part of the teachers’ motivation for employing Facebook was to help the students forge connections between school subjects and out-of-school concerns. In cases 1 and 3 the hope was that forging such connections would heighten the degree to which the students found the subjects relevant and would increase their interest in and understanding of them. In case 2, the intention was to support students in employing their school knowledge during their practicum. Student views on how the Facebook activities influenced their attitude towards the subject matter are measured quantitatively by the items in Table 2.

Table 2. Student views on clarity of Facebook activities and how the Facebook activities influenced their attitude towards and understanding of the subject matter. 7 point Likert-type scale.

Item	Case1: Mean (SD)	Case2: Mean (SD)	Case3: Mean (SD)
more relevant to daily life/practicum	3.85 (1.67)	3.53 (1.30)	4.23 (1.63)
concepts easier to understand	4.64 (1.68)	3.00 (1.46)	4.05 (1.99)
makes book easier	3.96 (1.59)	N/A	N/A
makes class teaching easier	4.00 (1.67)	N/A	N/A
makes report writing easier	3.65 (2.00)	N/A	N/A
is fun	4.27 (1.60)	3.73 (1.53)	4.64 (1.99)
makes [subject] fun	4.27 (1.87)	3.53 (1.19)	4.50 (1.99)

In cases 1 and 3, the students as a group found the Facebook activities mildly conducive to their understanding of and attitude towards subject matters. The mildly positive evaluation is strengthened by answers to the open-ended questions. Here, statements pointing to aspects which have stimulated interest clearly outnumber those to the opposite effect (13 positive, 4 negative in case 1; 26 positive, 4 negative in case 3); and statements indicating that Facebook activities furthered understanding of

subject matters outnumber the reverse (5 positive, 1 negative in case 1; 4 positive, 2 negative in case 3). However, it is only in case 3, where the students focused on the phenomenon of Facebook communication itself that they found the activities (slightly) conducive to seeing the relevance of subject matter in out-of-school contexts. That the Facebook activities in case 2 did not raise student experience of relevance of their biology class to their practicum is perhaps somewhat surprising given the teacher's intention in employing Facebook. On the other hand, the answers may simply reflect that the students already considered the biology class relevant and that the Facebook activities did not as such add to this. The supplementary information from the qualitative statements is inconclusive on this point.

A few of the students (2 in case 1, 4 in case 3) commend the coupling of formal and informal practices itself. Their statements are in line with the teachers' intentions of helping students forge connections between contexts in and out of school. Examples include: "One forges a connection between leisure time (Facebook) and homework" and "We made biology less school-like and got Facebook which is a big part of our lives into something school-related" (both statements from case 1). Confer also the two quotations above from case 3.

3.2 Tensions and constraints on communication

Constraints on communication. In response to the open-ended item "what did you find negative about using Facebook for [specifies the educational activity/setting]?" many students mention constraints which Facebook as a communication platform poses on student activities (11 statements in each case). Platform focused issues include the way information is structured on the site (leading to 'disorganization' of information) and the limitations set by the lack of access to oral communication, gestures, facial expressions etc. Technical issues are mentioned by a few. Practice related aspects are commented on as well: Firstly, some students do not have a Facebook profile or do not visit it regularly. This of course constitutes a hindrance for communication about learning matters for these particular students, and, more generally, is experienced by other students as an impediment to class communication. Second, several students (5 in case 1, 5 in case 3) note that Facebook offers many distractions (notifications, commercials, messages etc.) and that they are easily side-tracked from their subject-related activities.

Coupling of informal and formal contexts. A number of students (12 statements in case 1, 1 in case 2, 10 in case 3) remark that they tend to not take the learning activities on Facebook as seriously as other activities (homework and in class), e.g. "We have sometimes forgotten it because you don't associate Facebook with homework", "It has been difficult to take it seriously compared to other homework" (case 1). On the basis of these statements, one might perhaps expect the students to have experienced a corresponding diminishment of academic demands in the Facebook activities in comparison with class activities. The data, however, do not clearly show this to be the case. Thus, in response to the quantitative items "I experienced the academic demands in [Facebook group/activity] as lower than in class" and "I experienced the academic demands in [Facebook group/activity] as higher than in class", students in cases 1 and 2 answer in a way which indicates that they found the academic demands to be of the same level as their class activities (Case 1: mean = 3.46 SD=1.84; mean = 3.35, SD = 2,00; Case 2: mean =3.93, SD = 1.03; mean 3.80, SD = 0.86). In case 3, students did find the academic demands lower (mean = 5.14, SD= 1.72; mean = 2.00, SD = 1.31). The divergence between case 3 and the other cases might be due to differences in the concrete Facebook activities undertaken in the three cases. The lack of a clear link between the experienced diminishment of the activities' significance (henceforth 'the diminished significance') and the experienced academic level might indicate that the former is attributable to Facebook itself, qua informal communication sphere, as a context for learning.

A number of statements express negative views on the coupling of formal and informal practices itself (3 in case 1, 6 in case 2, 6 in case 3). Illustrative examples are "[Use of the school's e-learning platform] is more proper, more school-like and professional" (case 1), "I don't think Facebook should be connected to school. For me, Facebook is a retreat where I don't have to be reminded of school all the time" (case 2), "Somewhat strange that teaching becomes part of your 'private life'" (case 3). A

few students note more specifically that they do not like to see the teacher's profile and/or the teacher to see their profile and be able to follow their Facebook life.

Surveillance. Several of the quantitative items query aspects of surveillance, either directly or indirectly by asking how the students view their educational Facebook communication in comparison with their communication in other Facebook groups and in class. The results are presented in Table 3.

Table 3. Student views on their communication practices in their educational Facebook communication in comparison with communication in other settings. 7 point Likert-type scale.

Item	Case1: Mean (SD)	Case2: Mean (SD)	Case3: Mean (SD)
I consider that [teacher] sees…	5.35 (2.04)	2.73 (2.21)	N/A
I consider that activities prevail on [educational Facebook setting]	4.31 (2.00)	3.53 (2.33)	N/A
I discuss in the same way as in class	3.77 (2.10)	2.87 (1.51)	N/A
I discuss in a more reflective way than in class	4.54 (2.10)	3.47 (1.55)	N/A
I write in the same way as on [other Facebook setting]	1.85 (1.26)	2.93 (1.87)	4.00 (2.41)
I write in a more reflective way than on [other Facebook setting]	5.77 (1.89)	5.20 (1.66)	4.32 (2.12)
I consider that activities prevail on [other Facebook setting]	2.85 (1.97)	4.00 (2.42)	N/A

Student attitudes appear to vary a great deal on this issue across the three cases. Thus, the only apparent unanimity is that the students say they wrote in a more reflective way in their educational Facebook setting than in other Facebook settings. In cases 1 and 2, students also agree that they do not discuss in the same way in the educational Facebook setting as in class. However, students in case 1 appear to find their contributions to the Facebook discussions more reflective than the ones in class contrary to findings in case 2. The differences may be due to the concrete activities undertaken on Facebook. They may also to some extent reflect differences in age group and educational goals between the cases. Thus, the data from case 1 fairly clearly indicate that the students reflected on the teacher presence and the sustained existence of their communication in the educational Facebook setting (in contrast to other Facebook settings). This reading is corroborated by answers to the open-ended questions where 8 statements (2 of them positive) concern surveillance issues, notably both surveillance from the teacher and from the other students.

The quantitative data for case 2 show the students to not be very aware of teacher presence and to be less aware of the persistence of their communication than on other Facebook groups. The qualitative statements modify this picture somewhat: 9 statements (all negative) concern surveillance issues, but apart from one they all mention visibility to fellow students as the problem ("very public if you have 'stupid' questions", "common forum – not all problems can be dealt with"). One interpretation is that since the Facebook activity was an opportunity for the students to discuss practicum matters with their teacher, they did not give *extra* thought to the fact that the teacher could see what they wrote. However, they *did* give extra thought to the fact that the dialogue was made publicly available to their fellow students.

4. Discussion

Increase/decrease in learning opportunities. On the basis of a review of the use of Facebook as an educational environment, Aydin concludes quite generally that "Facebook contributes to an easier flow of communication between teachers and students." (Aydin, 2012, p. 1095) A prime reason is the increased, informal relationship which Facebook affords. In addition, Aydin points to studies which highlight the pervasiveness of Facebook in students' lives and its easy-to-use functionalities for knowledge-sharing and interaction.

Our study corroborates the results of the research reviewed by Aydin as concerns the affordances of Facebook both as a technological platform and as an integrated part of students' lives which allows for easy access to educational communication in general and with the teacher in particular (especially case 2). Furthermore, our study suggests that Facebook as an 'everyday platform' tends to increase the conspicuousness of the educational activities taking place on it. In this sense, utilizing Facebook for educational purposes presents an increase in learning opportunities for the students. On the other hand, however, our study also reveals counteracting characteristics of Facebook as a learning platform, implying a decrease in learning opportunities: Distractions are many on Facebook and the very everydayness of the platform seems to lend an appearance of diminished significance to the activities taking place there. At the same time, though some students approve of "get[ting] something of our everyday into the lessons", it appears reasonably clear across the three cases that utilizing Facebook as a learning platform does not in itself increase the relevance of the educational activities for out-of-school contexts. Thus, our study adds important qualifications to previous research and serves to give some counterbalance to the optimism displayed in the literature concerning "the potentials for learning" of Facebook (Ajjan & Hartshorne, 2008; Lampe et al., 2011; Mazman & Usluel, 2010).

In one obvious respect, not discussed in the abovementioned literature, the employment of Facebook as a learning platform poses a clear decrease in learning opportunities for a specific subset of students: Quite a large minority of Danish youth does not have a Facebook profile (cf. introduction). In case 1, 2 of the 30 students did not (data for cases 2 and 3 are not available). For some activities – primarily the ones taking place in class – these students were able to pair up with other students and participate through their profiles, but for most of the activities they were effectively left out of the educational communication. This constitutes a clear ethical problem in that learning opportunities which formally should be equal for all students in the given educational program become contingent on student engagement in a specific virtual environment not hosted by the educational institution itself. The problem is accentuated by the fact that Facebook is owned by a commercial enterprise which may exploit user information on the platform in marketing offensives. As such, it would seem a violation of student rights for the school to formally require them to acquire a profile on the platform. An American study reports that students who decline having a profile on social networking sites often do so for ideological reasons, e.g. because they disapprove of the way identity is constructed on the sites (boyd, 2007). It seems reasonable to hypothesize that Danish students decline on similar grounds. In effect, the utilization of Facebook for learning amounts to giving such students the unfair choice between joining a platform of which they disapprove or missing out on learning opportunities.

Surveillance and privacy issues. Across our three cases, a number of students voice criticism of the invasion of their privacy – the "retreat where I do not have to be reminded of school" – by the educational Facebook activities and, especially, by their teacher. Though views on this issue are to some extent balanced by positive assertions as to the convenience and meaningfulness of forging links between school settings and everyday activities, the risk should not be overlooked that some students feel coerced into surrendering more information about themselves than they want to. The divergent student views on the significance of privacy versus convenience correspond to the variances reported in (Roblyer, McDaniel, Webb, Herman, & Witty, 2010): In a study of college student and faculty attitudes towards using Facebook in education, 46.7% of the students (N=120) agreed that "it would be convenient" whereas 22.5% agreed that "Facebook is personal/social – not for education!" and 15.0% that "My privacy would be invaded." Incidentally, the corresponding percentages for faculty (N=62) were 21.0%, 53.2% and 22.6%, respectively, indicating that faculty in general are more skeptical than students about coupling the formal practices of education with the informal practices of

Facebook. Further, students (undergraduate and graduate) find passive behavior (such as viewing profiles, photos and videos) significantly more acceptable than active behavior (such as sending messages and commenting on photos) for both teachers and fellow students (Teclehaimanot & Hickman, 2011). This suggests that breaches of private life are deemed more offensive when involving teacher-initiated interaction than mere pulling of accessible personal information. Notably, our study shows that students may feel the breach of privacy not solely as regards their out-of-school life, but also as regards their educational performance which is displayed to their classmates against their wish.

5. Concluding remarks

By way of conclusion we shall summarize what our study has shown about our research question: How do formal and informal practices interact to create tensions and possibilities for communication when Facebook is engaged as a platform for learning?

The overall answer to the question is that the coupling of formal and informal communication practices on Facebook serves to open up new learning possibilities whilst at the same time creating barriers to communication which rest both on ethical issues and on a certain depreciation of the activities ensuing from the everydayness of Facebook as a communication platform. More specifically, our study has shown the following:

- The *affordances* of Facebook as a platform for learning are high, both technologically and in terms of familiarity of use, but *distractions* are many.
- The *everydayness* of the platform at once raises conspicuousness of educational activities and leads to a diminished significance of them.
- *Students* who have chosen *not* to be *on Facebook* are faced with an unfair choice between joining a commercial platform of which they disapprove or missing out on learning opportunities.
- Students disagree on their attitude towards the *coupling of their private/social Facebook sphere with their educational sphere*. To some this is convenient and raises the meaningfulness of their educational activities. Others consider it a breach of privacy and feel under surveillance by teacher and fellow students.

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APPLICATION OF FLORIDI'S INFORMATION ETHICS MODEL IN HIGHER EDUCATION: IMPROVING INFORMATIONAL ABILITIES IN A FIRST YEAR EXPERIENCE CLASS

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Abstract

The authors of this paper incorporated Luciano Floridi's model of information ethics as Resource, Product, and Target in a First Year Experience class (FYE). The students first discussed Floridi's RPT construct, then engaged in 3 sessions of training in information search processes. Students then answered a 25 question survey about the metacognitive process of information search based on Bowler's (2010) description of the process. Incorporating the "product" aspect of the RPT model, students then engaged in a review of the questionnaire and revised it to more accurately reflect their metacognitive processes. The "product" was then circulated via personal contacts and a social networking website (target) for feedback (resource) on its use as an assessment tool. The final "product" of the class was a metacognitive reflection paper on their awareness of their cognitive development during the first semester of college. These reflective papers were posted to the students' e-folios (another product for a different target). A qualitative analysis of the compiled reflective papers provides information regarding the students' learning about their informational abilities.

Keywords

Higher education, information ethics, information literacy, infosphere, Luciano Floridi, metacognitive processes, student learning

1. Introduction

Luciano Floridi's latest volume regarding the philosophy of information (Floridi, 2013) addresses the ethical questions resulting from the ever expanding and integral nature of the infosphere. His unified model for information ethics, which defines information as Resource, Product, and Target (RPT), directly challenges the mission of higher education. The university community as a whole plays an important role in the use, development, and evaluation of the infosphere. Wolf, et al. (2013) suggest that higher education uniquely depends on and contributes to the infosphere, and that its mission must address the ethical imperative to prepare students to deal with information in more sophisticated ways.

Higher education has addressed the integration of the digital infosphere through the practices of course websites, increased numbers of on-line courses, and the use of massive open online courses (MOOCs) (Kop, et al., 2011). Now higher education must, as Wolf, et al. (2013) recommend, refocus on information ethics in the classroom. When done well educational efforts emphasize connectivity, collaboration, and ready use of easily available information. The desired outcome is emergent learning for large numbers of students.

The analytical abilities needed include more than the ability to differentiate between a general web search and a search through scholarly indices. Students need to develop the metacognitive skills to find, assess, and understand the need for assessing information. Appropriate cognitive development in university students includes the enhancement of strategies for information retrieval, information use, and information construction. As Floridi describes this process, students need education for the intentional and thoughtful interaction with information as resource, product, and target.

Rather than simply putting more courses on-line or requiring students to find relevant and credible information in an overwhelming information environment, universities need intentional scaffolding of exercises and courses that will develop student informational abilities and the metacognitive skills

directing their use of information. This paper reports the study of a course structured to improve student informational abilities.

1.1 Literature Review

Although students presently entering the university are in large part "digital natives," born after the 1980s into the internet/information age and seemingly adept at managing information and communication technologies (ICTs), they face new challenges in respect to evaluation and use of information in an overwhelmingly information rich world (Palfrey & Gasser, 2008; Holman, 2010; Saade, Morin, & Thomas, 2012). At a minimum, students need to know how to direct their own learning, how to critically assess the resources they find, and to have competence and confidence in their ability to use the tools for collaboration (Kop, 2011). Information overload and a lack of specific informational abilities are barriers to effective student learning (Palfrey & Gasser, 2008; Gasser, et al., 2012).

As Wolf, et al (2013) recommend, "higher education must now refocus and emphasize in its classrooms and for its students the practices associated with developing strong analytical abilities with respect to obtaining, assessing, digesting, and synthesizing information." Additionally, Floridi's theories on information ethics provide a foundation and argument for the moral and ethical construction and use of the infosphere and its contents (Floridi 2007, 2013).

The widespread availability of library databases, electronic journals and books, and other new technology such as discovery services (unified searching across all library resources) has made it easier for students to find research through library resources. However, scholarly articles, and to a lesser extent, books both freely available and through proprietary databases can often be found through a simple web search; the application of internet protocol and geolocation technologies allows for the seamless access to these resources to the extent that library patrons may not even realize the content is being provided by their library. This is blurring the lines between what is considered a library resource vs. what is an online or internet resource. As Purcell notes, students entering into the university are very likely to begin research projects through a search engine rather than through the library's website (2012). There is often an inconsistency in terms and notions as far as when to use a library resource rather than an online resource, when many students see these as one and the same.

While librarians have traditionally taught library skills through one-time instruction sessions, this has only allowed them enough time to showcase resources or provide very basic instruction—how to use the catalog, where to access the databases, etc. Academic libraries can better support the development of metacognitive skills by focusing on critical thinking and evaluation of information. Many universities have been doing this by creating credit bearing formal classes in information studies or by revising library instruction to focus more heavily on evaluation and ethical use of information, and transliteracy, which teaches students to apply learned skills across a spectrum of resources and applications (McBride, 2011-2012). In terms of informational abilities or information literacy, Dunaway notes that librarians in particular have been trying "to connect to students' learning networks" rather than simply showcasing library resources through traditional bibliographic instruction (2011, p.675). The transforming information landscape is driving the need for these skills.

An approach to address these needs requires action beyond simply putting more courses on-line or requiring students to find relevant and credible information in an overwhelming information environment. Research on cognitive development in adolescents and young adults has expanded considerably since the topic was first explored by William Perry (1970). Perry's classic scheme of cognitive development theorized the movement of college students from a position of intellectual and ethical dualism through multiplicity to relativism. This development is manifested through an increasingly sophisticated epistemology moving from basic authoritarianism to rational and empirical support and from an absolutist perspective to one of tentative affirmation. A student at any particular stage of Perry's scheme is incapable of understanding the epistemological perspective of a stage that is more than one position farther along. This ability or inability to understand the process of cognition is explained by Flavell's (1979) work on metacognition as a practice of monitoring one's cognition. Flavell (1979) described metacognition as one's awareness of understanding or lack of understanding,

one's confidence, strategies, and both accurate and inaccurate assessments of cognitions. Kuhn defines metastrategic knowing as an awareness about procedures, and metacognitive knowing as an awareness of what one knows. Metastrategic knowledge is further divided into metatask knowledge, concerned with task goals and metastrategic knowledge, the understanding of which strategies are available to accomplish those task goals (Kuhn & Pearsall, 1998 in Kuhn, 2000). Kuhn's work suggests the importance of connecting skill development to metacognitive development. As cognitive tasks become more complex, the metacognitive aspects become more important because students are required to make increasingly more complex decisions about their cognitive strategies.

Universities need intentional scaffolding of exercises and courses that will develop student informational abilities and the metacognitive skills directing their use of information (Bowler, 2010). As Bowler (2010) demonstrated, students who conduct successful information searches are also able to recognize the cognitive processes involved in such a search. Using a quantitative analysis of students' journals on their informational search process, Bowler identified 13 attributes of metacognitive knowledge that contribute to successful information searches. The metacognitive taxonomy she developed serves as the basis for this investigation into metacognitive skill development. These metacognitive informational abilities clearly address the problems identified by Kop (2011) and may serve as specific student learning outcomes that transcend particular content.

2. The study: methods, design, outcomes, and discussion

2.1 Methods

Subjects consisted of 17 enrolled students in an Honors First Year Experience course. The data analyzed consisted of a required assignment for the course. Students were given an informed consent form that explained the request to use their work for the study. Students had the option of refusing consent with no negative consequences.

2.2 Design

Students first engaged in a classroom discussion of Floridi's Information Ethics and his model of information as Resource, Product, and Target. Students then participated in three classroom sessions regarding information, information search, and library skills. Students were given an information search assignment to assess how well they understood the lessons regarding quality of information, the differences between scholarship and journalism, and the availability of unsubstantiated information on the internet.

Following the information search assignment, students completed the *Information Search Process Questionnaire* (ISPQ). This is a pilot instrument intended to assess students' awareness of their own search processes. It also served as the basis of a class discussion of the questionnaire and student search behaviors. Students recommended revisions for the questionnaire and posted it on a social network site for feedback. Copies of this questionnaire are available upon request. Students reviewed the feedback and considered the effectiveness of the new questionnaire. The course design attempted to increase students' metacognitions about their own information search processes and about the nature of information. Their posting of the ISPQ and generating on-line feedback demonstrated their own role in information as product.

At the end of the course, students wrote individual reflection papers in which they discussed their personal and intellectual growth during the first semester of college. The reflection papers were qualitatively analyzed for evidence of students' metacognitions about information.

2.3 Outcomes

One goal of this work was to develop an instrument for quantitatively measuring student metacognition of their information search behaviors. Based on Bowler's (2010) description of 13

metacognitive strategies, the researchers developed a pilot instrument to assess these skills in first year students. The students' results on this instrument showed very high variability, in spite of the fact that all of them had received specific instruction in how to conduct scholarly information searches. A discussion of these results led to a revised instrument that students then administered to family, friends, and teachers.

As the students observed, the problem with a self-report involving skills is that accurate assessment requires both an understanding of the skill itself and a metacognitive ability accurately appraise one's own behaviors. Many of the students administered the questionnaire to younger siblings who scored themselves very highly on the questionnaire. When closely questioned about their behaviors, these younger siblings demonstrated that they did not understand how to conduct a high quality information search. They were extremely comfortable using the internet, but they had almost no awareness of the variability of the quality of information.

The outcome of this portion of the course was that the students determined the most effective method of assessing the quality of information search skills is to observe the behaviors themselves rather than using individuals' self-reports of their skills. An assessment of relevant metacognitive skills continues to require that students describe their own cognitive processes during information search and information use assignments.

The qualitative analysis of the students' reflective essays suggests that students develop metacognitive skills at the same time they are developing specific academic skills. As students develop a more complex view of information, they also develop a metacognitive understanding of their skills. The process of this development occurs over time, rather than instantaneously and frequently includes periods of confusion. As each level of abstract cognition becomes more solidified, the accompanying metacognition becomes clearer and less confused.

By the end of the first semester, most of the students had developed and recognized a set of meta-strategies for mastering information. Of the 17 essays, 14 of them included detailed strategies for mastering information. Most commonly, these meta-strategies were identified simply as methods for doing well in courses. However, in six essays, the students exhibited a higher order meta-strategy, recognizing that their strategies were beneficial for their personal comprehension and application of information:

I get distracted very easily, so I have to force myself to concentrate. But if I put the time and effort needed into something I find I get good results.

I realized that if I stay on top of my work that I am able to stay caught up in my classes and I am able to pass my tests

I had to learn how to move schedule around practices and meets, so I could stay on top of classes and other activities

The level of work to be done was also a surprise, studying for tests a new concept I had to learn, working on papers more and more to polish them. …In college the same principle helps a great deal, but requires more thought, time and revision.

It is also largely the student's work ethic outside of the classroom that will determine their degree of success.

You have to consider what is most important and prioritize your time so as to complete all that you want to in a day, while maintaining a healthy balance for yourself. … I learned that getting assignments done earlier left more time to make sure that it is good quality work and there is less stress.

Three students identified specific meta-strategies for assessing the quality of the information they were studying:

If I can recreate events and puzzle them out myself, or experiments I often will and it is very helpful...

I have already learned valuable skills that will help me attain my academic goals, such as note-taking, daily reviewing, and utilizing the resources I am provided with.

Sharing responsibilities with lab partners and critiquing other students' work helps us to do a better job as students and employees.

The second most commonly mentioned metacognitive skill, self-monitoring, seems to be intricately connected to the use of meta-strategies. Frequently, the self-monitoring cognitions involve recognizing that the student knows what strategies to use and must exercise some self-discipline in order to follow through with applying those strategies. Again 14 essays included specific self-monitoring behaviors:

I am able to look back and realize mistakes I have made and how I can fix them.

I have to be responsible for balancing my academic and social life so that I still receive good grades.

Although I still feel like I am barely grasping the things that I must understand in my courses to succeed, I am certain that with practice, this mentality will become normal for me. …I must teach myself to teach myself and think critically of all information at all times.

Of these, two of the students who identified self-monitoring skills did not explicitly describe their meta-strategies. Additionally two students who did identify meta-strategies did not report any self-monitoring skills.

Much less commonly, students mentioned the metacognitive practice of assessing the quality of the information they were studying. This type of metacognition appeared less frequently and also contained errors as concepts about the nature of information were developed. There was confusion and contradiction in the descriptions of the nature of information. Only five of the students mentioned the quality of information, and of these only three addressed the issue of depth and critical thinking:

Every question was multi-faceted and complicated, with the answer only as correct as the amount of research you put into it. Now, learning was no longer memorization, but the comprehension of complex concepts.

College on the other hand, goes more into "unpacking" topics…and I have discovered that in order to succeed in college, a student can't get away with just memorizing definitions, a test is a chance for a professor to make sure that you have a full understanding of a topic, and that the student would be able to apply it to other circumstances.

How do you tell when the People who are supposed to know what they are talking about, don't? …Just hunt up some other well-known and documented sources, do a little fact checking to confirm the information, besides I [sic] never hurts your case to have several experts who say you are right rather than just one.

Two of the students discussed "good" and "bad" or "true" and "false" information, but both revealed significant confusion and inconsistency:

There is such a thing as 'bad' information even if it is true. This is due in part to the sheer amount of information online. …By far the most useful information was the information we received about how to find useful information online and at the library.

I have compiled a mental list, of certain bits of information that I know to be true, anything caught out being wrong about these I no longer will consider reliable and ditch it.

They have some understanding that not all material found on the internet is equally trustworthy, but they have no clear epistemological principles. One of these students provided a fairly coherent pluralistic position of "all perspectives are equally valid" while the other student argued that "all perspectives are equally invalid."

Finally, seven students addressed their metacognition regarding determining the effective and ethical treatment of information. Although these comments demonstrated an understanding that mastered information will have applications, there was very little understanding of how their personal use and development of information had ethical implications. The ethical issues seemed to be very general, and reflected the students' intention of using their education "for the common good." One essay that addressed ethical implications also contained thoughts regarding the nature of information. In that essay the ethics comments addressed the ability to manipulate opinions and ideas of others through the use of information:

If you act like authority people will obey you, and if you sound like you know what you are talking about you often will be assumed to. In debate I have manipulated this assumption many a time to beat less assertive competitors with real evidence, using only off the cuff adlib. If I can do it while being but a novice...imagine what a master could do.

2.4 Discussion of results and implications

The first goal of this project was to implement a pedagogical intervention for increasing student awareness of and interaction with the infosphere. This goal included five specific objectives for increasing students' ability to 1) monitor and regulate their own search behaviors, 2) evaluate the quality of specific information, 3) evaluate the relevance of specific information, 4) recognize the limitations of their own knowledge, and 5) locate and utilize appropriate assistance in their information searches.

The classroom interventions directly addressed these goals by providing formal instruction on information search procedures and conducting classroom discussions about student research experiences. In spite of specific instruction, students still demonstrated considerable confusion about the nature of information and the ethical treatment of information. Apparently, during the first semester of college work most students are focused on general study practices and self-regulation rather than on improving their understanding of the nature of information. Some students do recognize a shift in the nature of their learning to multiplicity and to relativism (Perry). But during this first semester, most students remain somewhat confused about the quality of information and their use of it. They are, at best, late pluralistic, happy to say "everyone has their own opinion" and all perspectives are equally valid.

The developmental changes in young adult metacognition have not changed as a result of the expansion of the infosphere. Progression from dualism to relativism progresses in much the same way as described by Perry in 1970 and revised by Rapaport (1986). The vast amount of data, and the extraordinary ease with which it can be accessed simply adds one additional layer (admittedly a powerful layer) to the traditional problems faced by college faculty. How do we teach students to approach information critically? How do we encourage thoughtfulness in the face of easy answers? How do we demonstrate that students' failure to apply critical analysis can have far reaching repercussions?

Sloppy thinking has always been a problem for college students. The infosphere simply compounds the impact of sloppy thinking. The infosphere also makes the ethical use of information a more immediate and critical issue than it was during the days before the internet. Yet students who are not developmentally ready to deal with metacognitive problems such as "the nature of information" are certainly not developmentally prepared to address the ethical issues of the infosphere. Educators in today's universities must develop intentional scaffolding strategies for teaching critical and ethical thinking within the infosphere. Such issues must be taught continuously as students continue to develop cognitively throughout their higher education. As students develop specific information literacy skills they should also be challenged with information use skills. As they learn to assess the quality of information, they need to assess the quality of their own products. As they place their own information in the infosphere students need to address the tension between such diverse interests as intellectual property versus open access, transparency versus privacy, and balancing on-line versus on-life for a "healthy life spent in the infosphere" (Floridi, 2013, Chap. 11).

The results of this small study suggest that even the very brightest of students remain relatively undeveloped in post formal thinking. Even these very bright students have a considerable way to go as they improve their metacognitive abilities. Faculty who use on-line courses, MOOCs, and course web-sites should include student learning outcomes regarding metacognitive skill development in the use of information. Faculty who encourage students to publish such academic artefacts as class papers and chat responses need to address the ethical concerns of students' contributions to the infosphere. If we want students to increase their understanding of the nature of information as resource, we must also insist that they address the nature of their own information as product and target.

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ETHICOMP IN LATIN AMERICA

William M. Fleischman

Abstract
This paper is a report on the genesis, organization, content, and significance of the regional ETHICOMP workshops conducted as constituent workshops of CACIC 2011 and CACIC 2012, the two most recent Argentine National Congresses on the Sciences of Computation.

Keywords
Ethical issues in the sciences of information and computing, conferences, Latin America

1. Introduction

This paper is in part a report on the two regional ETHICOMP workshops organized by the author in collaboration with valued colleagues from Universidad Nacional de La Plata and Universidad Nacional de Tierra del Fuego, and conducted as constituent workshops of CACIC 2011 and CACIC 2012, the two most recent Argentine National Congresses on the Sciences of Computation. (CACIC – Congreso Argentino de Ciencias de la Computación). We begin with a (very) short history of the ETHICOMP regional working conferences, provide some of the relevant back story and an account of the content and activities realized in the two Argentinian workshops, and conclude with an assessment of their significance both for the Argentine community of academics and professionals in computer-related fields and for the larger international ETHICOMP community.

2. The ETHICOMP Regional Workshops

As a matter of background, the formal name of the first workshop was I ETHICOMP Latinoamérica. I ETHICOMP Latinoamérica was the second in an occasional sequence of workshops organized by the ETHICOMP community to open dialogue with groups of professionals and, in the larger sense, with societies that have been underrepresented or absent from the series of international ETHICOMP conferences dating back to 1995. The first workshop was held at Yunnan University in Kunming, China, as a post-conference activity of the 2007 ETHICOMP conference organized by Kiyoshi Murata at Meiji University in Tokyo, Japan. The 2007 workshop was a free-standing event organized by Simon Rogerson, Terry Bynum, Don Gotterbarn, and Kiyoshi Murata.

By contrast, I ETHICOMP Latinoamérica was accepted for inclusion in CACIC 2011 on the basis of a proposal presented by William Fleischman, as one of eleven workshops conducted in parallel – essentially, conferences within a larger conference – around which the annual Argentine National Computing Conferences are organized.

The structure of each of the annual CACIC's is centered around a series of workshops conducted in parallel. These are sheltered in a congress in which, in addition, there are weeklong courses for students from the disciplines of computer science who participate in the congress, as well as plenary activities including an Ateneo de Profesores (an Athenaeum for Professors devoted to issues in the various aspects of computing and informatics curricula and degree programs). Three keynote lectures in the early evening of each of the three central days of the congress constitute plenary activities attended by students, academics, and professionals. In CACIC 2011 there were eleven workshops. Among them, for example, were XII Workshop Sistemas y Agentes Inteligentes (Intelligent Systems and Agents) and VIII Workshop Bases de Datos y Minería de Datos (Databases and Data Mining). The Roman numeral preceding the workshop name indicates the ordinal of iteration of the workshop over the seventeen-year history of the CACIC congresses. Thus, I ETHICOMP Latinoamérica represented the first time that consideration of ethical issues was included in CACIC.

3. Origins of the ETHICOMP Initiative in Latin America

The short history of the origins of the Latin American initiative begins with the 2010 ETHICOMP held at Universitat Rovira i Virgili in Tarragona, Spain, organized by Mario Arias Oliva, Simon Rogerson, and Terry Bynum. Early on, there were discussions aimed at conducting a second ETHICOMP workshop in Chile following the 2010 ETHICOMP. The need for such a workshop was indicated by the chronic absence of representation from Latin America in the ETHICOMP conferences of the past decade. The expectation was that the workshop would be hosted by Chilean colleagues of Mario Arias at Universidad de Atacama in Copiapó.

These preliminary arrangements were set aside due to extraordinary circumstances in the family life of Professor Arias superimposed on the heavy responsibilities of organizing the highly successful 2010 ETHICOMP conference. (Corramos un tupido velo sobre la inoportuna erupción del volcán islandés que proporcionó a varios participantes europeos y norteamericanos el pretexto para unas vacaciones prolongadas en Catalunya. *Translation*: We draw a chaste curtain over the matter of the inopportune eruption of the Icelandic volcano that provided the pretext for a prolonged vacation in Catalunya for fortunate European and North American participants in the Tarragona ETHICOMP. *Just a joke*.)

After the closing session of the Tarragona conference, I spoke with Simon Rogerson, Mario Arias, and Don Gotterbarn, indicating my enthusiasm for the project and my willingness to attempt to find an appropriate venue and time for the realization of the first workshop in Latin America. These colleagues gave their blessing and agreed that the project should move ahead.

My initial efforts at organizing the workshop were undertaken with the assistance of a Chilean colleague on the faculty of Villanova University. In pursuit of a suitable host and venue for the workshop, I made a trip to Chile, as a speculative venture and at my own expense, in summer 2010. This, however, failed to produce an invitation or indication of interest from any of the several potential host institutions contacted in Chile.

When it became clear that there was little likelihood of finding a Chilean university to host the ETHICOMP regional workshop, I turned to two Argentine colleagues, Miguel Angel Mayosky and Fernando Tinetti, who had been students in a course on parallel algorithms that I presented during the years from 1987 to 1996 when I was an occasional visiting professor of computer science at Universitat Autònoma de Barcelona. These two former students, now professors on the faculty of Universidad Nacional de La Plata (UNLP), responded with generous enthusiasm to the idea of a workshop on ethical issues in computing. Through their intermediacy, the regional workshop proposal was presented to Professor Armando De Giusti, Titular Professor of Informatics (Profesor Titular de la Facultad de Informática) and Academic Vice President of UNLP. Professor De Giusti responded with equal enthusiasm.

The proposal for the ETHICOMP workshop, as initially presented, followed the model of the previous workshop at Yunnan University and the abandoned Chilean venture in that a small free-standing conference was envisioned. After investigating this possibility, Professor De Giusti reported that the proposed workshop dates – in January or February of 2011 (high summer in Argentina) – were not feasible because of conflict with customary vacation periods and pre-existing commitments for international educational projects.

Providentially, however, Professor De Giusti indicated that UNLP was scheduled to host CACIC 2011, the annual Argentine National Computing Conference, in October of 2011 and thus it would be natural to include the workshop as part of that activity. On the basis of a revised proposal, the international ETHICOMP community received a formal invitation from Professors De Giusti and Patricia Pesado, principal organizers of CACIC 2011, integrating I ETHICOMP Latinoamérica into the national congress. Subsequently, these contacts resulted in my being invited to present one of three keynote addresses to the congress.

4. I ETHICOMP Latinoamérica

At this point, it seems appropriate to include the English language version of the prospectus for the first workshop as presented to the organizers of CACIC 2011. I prepared two versions – in English and Spanish. The version appearing on the English language page for I ETHICOMP Latinoamérica on the CACIC 2011 web site [XVII Congreso Argentino de Ciencias de la Computación, 2011] appears to be a "back translation" of the version in Spanish that I prepared based on this document composed in collaboration with Simon Rogerson.

4.1 Workshop Prospectus:

The prospectus title was "ICT Ethics in Practice."

"The ETHICOMP name is synonymous with an international inclusive dialogue concerning the ethical and social issues associated with the development and application of Information and Communication Technology (ICT). Since 1995 there have been eleven conferences in addition to workshops and reports under the ETHICOMP umbrella. All have been organised by the Centre for Computing and Social Responsibility (CCSR) of De Montfort University in the UK in collaboration with other universities around the world. The ETHICOMP Working Conference series was launched in 2007 in China. It is a new venture designed to promote ICT ethics and social impact activity in regional academic and professional circles. Dialogue with colleagues in South America has been limited in the past. As part of the ETHICOMP Working Conference series, the purpose of the ETHICOMP Workshop at CACIC2011 is to share insights and perspectives from fifteen years of ETHICOMP activity and to initiate a vigorous and sustained dialogue linking the countries of the Southern Cone with the international ETHICOMP community.

The aim of the workshop is to discuss the ethical issues surrounding information and communication technology from a South American perspective. This will be based upon the following broad themes:

- the concepts of computer and information ethics
- the ethical issues related to typical ICT applications in various sectors relevant to South America including
    - privacy and surveillance
    - E-government
    - Electronic voting technologies
    - open source initiatives
    - digital media and intellectual property norms
    - The Creative Commons initiative
    - robotics (e.g. medical and military applications)
- the implications of such issues on professional practice
    - the role of professional organizations and special interest groups
- how such issues might be included in school and university educations programmes in South America in general and Argentina in particular
    - the relative merits of a dedicated course on ethical and social issues versus the inclusion of modules in individual courses such as software engineering, databases and data mining, robotics, etc."

4.2 Workshop Organization

The organization of the workshop was entrusted to a coordinating committee named by the congress organizers, and a scientific or programme committee which was constituted on the basis of nominations from Simon and myself and our Argentinian collaborators. The programme committee

was responsible for reviewing papers submitted for presentation at I ETHICOMP Latinoamérica. For completeness, here is the list of the membership of the two committees:

As listed on the CACIC 2011 web site, the workshop coordinating or organizing committee consisted of the following individuals:

Simon Rogerson (De Montfort University)

Terrell Ward Bynum (Southern Connecticut State University)

William Fleischman (Villanova University)

Guillermo Feierherd (Universidad Nacional de La Patagonia SJB)

Mario Arias Oliva (Universitat Rovira i Virgili)

The scientific or programme committee was composed of the following individuals:

Rafael Capurro (Stuttgart Media University)

Armando De Giusti (Universidad Nacional de La Plata)

Anne Gerdes (University of Southern Denmark)

Donald Gotterbarn (East Tennessee State University)

Gonzalo Iglesias (Universidad Nacional de La Plata)

Maria Clara Lima (Universidad Nacional de La Plata)

Miguel Mayosky (Universidad Nacional de La Plata)

Kiyoshi Murata (Meiji University)

Ugo Pagallo (Università di Torino)

María Inés Tula (Universidad de Buenos Aires)

At this point, also, it is more than appropriate for me to acknowledge the extraordinary contributions of two Argentine colleagues – Fernando Tinetti and Guillermo Feierherd. Professor Tinetti was tireless in supporting the preparations for the workshop, helping in so many ways to overcome the obvious difficulties of organizing a conference from a great distance, in a place that none of us from North America or Europe had ever seen, working with an established structure – the CACIC congresses – having a fifteen year history and its own organizational dynamic. And even though I felt reasonably confident communicating in Spanish, my confidence was stronger in oral communication, in less formal circumstances, but less certain in extended written communication where the possibility of serious consequences arising from misunderstanding was by no means excluded. Thus, Fernando's advice and actions in mediating communication between Europe, North America, and Argentina were invaluable. I cannot overstate the importance of his generous behavior in facilitating preparations for the first ETHICOMP workshop. He and his family were also exceptionally generous in offering me a place in their home during my stays in La Plata. This enabled me to get the feel of the city of La Plata and several of its neighborhoods, which resulted in my developing a strong attachment to the city and to Argentina. If I mention this, it is not only to give public expression to my gratitude but also to underscore my sense of the welcome we received from UNLP and everyone associated with the congress.

I was not acquainted with Professor Feierherd before the preparations for CACIC 2011. He was entrusted by the organizers with the portfolio of integrating I ETHICOMP Latinoamérica into the structure and calendar of the congress. It must, at times, have seemed to him an exotic, if not quixotic, undertaking. Nevertheless, in the course of preparations for the first workshop we developed a strong personal rapport, something that has had considerable importance for the subsequent history of the ETHICOMP initiative in Latin America.

Professor Feierherd and I understood the importance of cultivating Argentine participation in the workshop. In spite of the implied invitation in the workshop prospectus, there were no papers submitted by Argentine authors for I ETHICOMP Latinoamérica. However, Professor Feierherd resourcefully arranged for a series of invited talks for the second day of the workshop. This

accomplished the significant purpose of introducing the Argentine voice and perspective into our discussions.

Congresses in the CACIC series normally occur during the second or third week of the month of October. Workshops at CACIC are slotted into the afternoons of the middle three days of the congress and are accorded one or two afternoons, depending on the number of papers expected. I ETHICOMP Latinoamérica workshop was scheduled for two afternoons, Tuesday, October 11th and Wednesday, October 12th, 2011. Five papers and one invited address, presented by members of the international ETHICOMP community, comprised the first day of the workshop. Here is the roster of authors, papers, and presenters:

4.3 Papers Contributed to the Workshop:

- Philippe Goujon and Stephen Rainey, "Ethics, Technology and Governance: Condition for Efficiency of Ethical Reflexivity in Technological Projects," presented by Philippe Goujon
- William Fleischman and Daniel Joyce, "Advantages and Trade-Offs of Introducing Ethical Issues in Computing through a Dedicated Course or through Modules in Relevant Content Courses," presented by William Fleischman
- Anne Gerdes, "Some Ethical Reflections on Relations between Human Beings and Social Robots," presented by Anne Gerdes
- Kiyoshi Murata and Yohko Orito, "The Right to Be Forgotten: A Nearly Fundamental Human Right in the Age of Total Recall Technology," presented by Kiyoshi Murata
- Mario Arias Oliva, Mar Souto Romero, Antonio Pérez Portabella, and Teresa Torres Coronas, "Teleworking: Myths and Realities" (not presented)
- The invited address, "Situating the Foregoing Papers in the Landscape of Ethical Issues in ICT" presented by Simon Rogerson

Needless to say, I ETHICOMP Latinoamérica could not have been convened without the contributions of these authors and the admirable undertaking of each of the presenters to make the long journey to La Plata to participate in CACIC 2011. This paper is, in part, a sincere thank-you note to each of them and a validation of the considerable effort they made to initiate dialogue with colleagues in Latin America on the questions at the heart of the ETHICOMP movement.

4.4 Invited Talks by Argentine Professionals and Academics:

The second day of the workshop included the presentations of the Argentine academics and professionals invited by Professor Guillermo Feierherd. Again, for completeness, here is the list of the presenters and presentations scheduled for the second session of I ETHICOMP Latinoamérica:

"Garantias Constitucionales en la Recolección de Prueba Informática," presented by Gonzalo Iglesias, Inter-American Development Bank, Transparency International, and the United Nations Development Program

"Consideraciones de la Ética en Comercio y Industria," to have been presented by Norberto Caniggia, CEO of C&S Informática and member of the Comisión Directiva de la CESSI (cancelled due to illness)

"Ser Profesional: Obligaciones y Derechos," presented by Hugo René Padovani, President of CPCIBA, el Consejo Profesional de Ciencias Informáticas de la Provincia de Buenos Aires

At the conclusion of these presentations, and in the best tradition of ETHICOMP conferences, there was a lively general discussion among workshop participants in which the perceived successes and shortcomings of I ETHICOMP Latinoamérica were summarized and the possibility (and advisability) of scheduling a second iteration of the Argentine workshop was discussed. Significantly, two of the prospective organizers of CACIC 2012 expressed their interest and willingness to incorporate a second workshop on ethical issues into the following year's congress.

5. ETHICOMP Has a Big Footprint at CACIC 2011

Although I ETHICOMP Latinoamérica was the centerpiece of the presence of ETHICOMP at CACIC 2011, there were two other events that gave the ETHICOMP movement and the set of concerns that characterize our discussions and conferences a larger presence at the Argentine National Congress on the Sciences of Computation. The first of these was an address by Dan Joyce of Villanova University and co-author with me of a paper presented in the workshop. Dan currently serves as Board Member and Vice Chair of the ACM Special Interest Group on Computer Science Education (SIGCSE), one of the largest and most active of the ACM SIGs. When Dan learned about the Ateneo de Profesores, a session devoted to issues in the various aspects of computing and informatics curricula and degree programs, he recognized that this presented an opportunity to share information about the large and active special interest group, SIGCSE, which might be relevant to the Argentine academic community and might generate contacts of mutual benefit to both parties. Therefore, he volunteered to present a short exposition on activities and publications sponsored by SIGCSE and the advantages conferred by individual and institutional SIGCSE membership. This proposal, transmitted to the CACIC organizers by Guillermo Feierherd, was promptly and enthusiastically accepted. Dan made his twenty-minute presentation in Spanish to a large audience at the Ateneo on Wednesday morning of the congress.

The second of the events that anchored the presence of ETHICOMP in CACIC 2011 was the plenary address (one of three CACIC keynotes), "Los Efectos de la Tecnología en Nuestra Comprensión de Lo Que Son la Inteligencia y la Cultura Humana" (The Effects of Technology on Our Understanding of Human Intelligence and Culture), which I presented in response to an invitation from the conference organizers. It was a tremendously rewarding and stimulating experience to prepare and present an extended exposition in Spanish concerning the ways in which technology is influencing our ideas about learning, memory, the role of books and libraries, and ultimately, human culture and intelligence. The effort (and terror) of making an hour and a quarter presentation in Spanish was abundantly repaid by the response of the audience, most particularly the large and engaged group of students who attended the keynote. One immediate happy consequence of the talk was an invitation to return to Universidad Nacional de La Plata the following month for a second talk presented to a more general audience of UNLP students, faculty, and administrators.

6. What Can We Say About the Significance of I ETHICOMP Latinoamérica?

To the uncritical observer, I ETHICOMP Latinoamérica may indeed have seemed a quixotic (ad)venture. Attendance at the workshop itself was scant. There were the predictable difficulties of two languages and two cultural contexts. What was striking, however, was the reaction of the Argentine students who attended the first session of I ETHICOMP Latinoamérica. They listened carefully to the presentations, were not intimidated by the barrier of discussing philosophical and technical matters in a language not native to them, and they were influenced by what they heard. This was most evident in the extended, intense dialogue between several of them and Simon Rogerson at the conclusion of his talk. Clearly they had heard in his words a call to conscience – something that appealed to their idealism and expressed the moral ambitions they felt should characterize the profession for which they were preparing.

This might appear to be an effect of minor importance, out of proportion with the effort involved in travelling such great distances to participate in the workshop. I think that would be a serious misunderstanding. One has only to observe the care with which student participation was integrated into the program of the congress, as well as the number of hours in the chronogram of CACIC devoted to student-centered activities, to recognize that one of the most significant objectives of CACIC is to provide experiences that enrich and broaden the perspectives of the cohort of students in the computing disciplines from all regions of Argentina. Certainly, this is one of the most important settings in which to cultivate a sense of solidarity and a strong and robust consciousness of professional responsibility among those aspiring to work, research, and teach in the various branches of modern computing.

In spite of difficulties imposed by the barrier of language, it appears that the workshop fulfilled its principal objectives. There was widespread recognition of the importance of the questions that lie at the heart of the ETHICOMP movement. The lively discussion that followed my keynote address at CACIC 2011 was a further indication of the resonance of these concerns among Argentinian colleagues and students.

As a practical matter, the organizers of CACIC 2012 were sufficiently impressed to include a second iteration of the ETHICOMP workshop in the congress held this past fall at Universidad Nacional del Sur de Argentina in Bahía Blanca. Of equal importance was the enthusiasm of Guillermo Feierherd for undertaking the role of Argentine organizer for a second iteration of ETHICOMP Latinoamérica. Both of these developments speak to the significant influence of our effort.

7. Aftermath of I ETHICOMP Latinoamérica

As previously noted, one welcome consequence of my keynote presentation at CACIC 2011 was an invitation from Javier Díaz, Dean of the Faculty of Computer Science at UNLP, to return in November 2011 for an afternoon lecture and discussion at UNLP. The audience for this event included students and professors from the Faculties of Arts and Letters and Pedagogy, in addition to "the usual suspects" representing Computer Science. This initiative on the part of Javier Díaz, especially the personal invitations he extended to colleagues from other faculties, bespeaks his awareness that the questions at the heart of the ETHICOMP movement are of interest not only to computer scientists. They affect a wide spectrum of academic, professional, and civic communities who should also be part of the dialogue. In a small way, this second presentation at UNLP represented an opportunity for engagement with this larger audience and is further indication that the inclusive nature of ETHICOMP was understood by those who hosted and participated in the Argentine workshop.

8. II ETHICOMP Latinoamérica

With Guillermo Feierherd taking the lead, I agreed to co-organize II ETHICOMP Latinoamérica as one of the workshops included in CACIC 2012 [XVIII Congreso Argentino de Ciencias de la Computación, 2012] at Universidad Nacional del Sur de Argentina in Bahía Blanca this past October. One important goal of the effort was to secure representation by Argentine authors among the submissions for the workshop. To this end, I made contact with several individuals with whom I had spoken during the discussion following my second lecture at Universidad Nacional de La Plata. The results of this initiative were two excellent submissions from two pairs of Argentine authors. In addition we received a paper from a team of young professors at a university in southern Brazil. Their paper described an educational and developmental project that is providing appropriate technology, instruction, and software to help the younger generation of families involved in small-scale agriculture learn to use available technological resources to maintain and modernize practices on their family farms.

8.1 Papers Contributed to the Workshop:

Here is the complete list of papers accepted for presentation at II ETHICOMP Latinoamérica:

María del Rosario Molfino (UNLP) and Claudia M. González (UNLP), "Open Access to Scientific Literature and Research Data: A Window of Opportunity for Latin America," presented by María del Rosario Molfino

Joaquín Bogado (UNLP) and María Beatriz Garcia (UNLP), "Reflexiones Iniciales acerca de la Utilización de Técnicas de Minería de Datos sobre Datos Personales en la Búsqueda de Terroristas," presented by both authors

Matthew J. Sher (Villanova University), "Millennial Dissonance: An Analysis of the Privacy Generational Gap," presented by Matthew Sher

Miriam Cátia Zarpelon, Deisi Balestrin, Ana Paula Bertotti, Cerize Maria Castilho, Samuel Diego Rese, Anibal Lopes Guedes, Marcelo Zanetti, and Márcio Eduardo (all of Universidade Federal da Fronteira Sul, Santa Maria), "Juventude Rural sob uma Nova Perspectiva: As Redes Sociais de Aprendizagem," presented by Miriam Cátia Zarpelon and Ana Paula Bertotti

Daniel T. Joyce (Villanova University) and William Fleischman (Villanova University), " A Consideration of the Lasting Effects of a Course Introducing Ethical Issues in Computing," presented by William Fleischman

Alberto Cammozzo (Università Degli Studi di Trento), "Do We Need an Open Face Recognition Search Engine?" (not presented)

It is worth noting that the workshop was authentically tri-lingual. The only paper presented in English was that of my student, Matthew Sher. Attendance at the workshop was good. It was remarked by more than one (non-presenting) participant that, in contrast to the normal dynamic of a congress with multiple concurrent workshops, those who came to hear the first paper in the session stayed for the entire session.

Again in CACIC 2012, the footprint of ETHICOMP in the congress extended beyond the workshop itself. The organizers of CACIC 2012 invited me to present a two-day tutorial describing the motivation for the inclusion of a course on ethical issues in university computing curricula and presenting a selection of topics and critical materials for inclusion in such a course. This seems a significant step in view of the fact that no such course currently exists in the computer science curricula in Argentine universities. In any event, it was an exhilarating experience to present the six-hour tutorial in the Spanish language and exchange ideas with a young, engaged and enthusiastic audience.

9. III ETHICOMP Latinoamérica – Looking to the Future

As I write, the call has been published for CACIC 2013. III ETHICOMP Latinoamérica is again numbered among the workshops for this year's Argentine National Congress on the Sciences of Computing. Although the ETHICOMP working conferences or workshops were originally designed as one-time events, the "domestication" of the workshop within CACIC suggests that the theme of ethical issues in computing and information has taken its place among the topics that are commonly considered worthy of representation in CACIC. Perhaps the "III" is a significant ordinal, an indication that one of the principal objectives of the Latin American initiative, the establishment of a critical dialogue on ethical issues relating to computing and information technologies, has been achieved.

Another welcome result of the Argentine workshops is that María del Rosario Molfino of Universidad Nacional de La Plata, co-author of one of the papers presented II ETHICOMP Latinoamérica, has accepted an invitation to join the ETHICOMP Steering Committee. As a representative of the library sciences, the Open Access Movement, and as the Committee's first Latin American delegate, she will provide new perspectives to inform the future activities of ETHICOMP.

Recalling the words of the original prospectus, "As part of the ETHICOMP Working Conference series, the purpose of the ETHICOMP Workshop at CACIC 2011 is to share insights and perspectives from fifteen years of ETHICOMP activity and to initiate a vigorous and sustained dialogue linking the countries of the Southern Cone with the international ETHICOMP community." I believe we have made a good first step toward this goal and we will soon have the opportunity of welcoming Latin American colleagues to forthcoming conferences of the international ETHICOMP series.

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TOR AND THE DARKNET: RESEARCHING THE WORLD OF HIDDEN SERVICES

Catherine Flick and Runa A. Sandvik

Abstract

This paper examines ethical issues to do with researching the Tor Project's capacity for hidden services – the "Darknet". It discusses particular issues to do with anonymity, confidentiality, and researching illegal activity that researchers should take into special consideration before delving into the rich world of Tor's hidden services, given the nature of Tor and its concentration on provision of technically anonymous services.

Keywords

Tor, research methods, darknet, hidden services, ethics, anonymity

1. Introduction

Tor is free software, developed and maintained by the Tor Project (2013 [3]), that allows users to connect to the Internet anonymously and securely. Through its proxy service, it also allows users access to content that might otherwise be blocked by local authorities or Internet Service Providers. Tor was originally developed as a project of the U.S. Naval Research Laboratory, for the purpose of protecting government communications. Today, it is used by a wide variety of people and organisations for a variety of different purposes.

Tor protects its users by bouncing their communications around a distributed network of relays run by volunteers all around the world: it prevents somebody watching an Internet connection from learning what sites the users are visiting, and it prevents the sites users are visiting from learning the users' physical locations. Thus Tor offers improved privacy, freedom, and security through prevention of surveillance, and allowing anonymous navigating around government (and other) censors. Tor works with many existing applications, including web browsers, instant messaging clients, remote login, and other applications based on the TCP protocol.

The particular technical capabilities of Tor means that it is agnostic as to the types of activities that are carried out on the Tor network. This makes it a potential double-edged sword, with the capability to support both "good" and "bad" uses. Concerns about dual-use technology are not new (Molas-Gallart, 1998), however, unlike with the chemical industry, technology such as Tor is designed in principle to circumvent any sort of regulation – even self-regulation. It is important to note that some traditional anti-social behaviour that occurs on the internet such as DDoS are not possible through Tor as it will only accept certain types of connection packets, notably TCP, and not UDP which is required for usual DDoS attacks. Tor also rejects port 25 (SMTP) connections by default, so is not directly able to allow spam-type behaviour, although users can still participate in this behaviour through other methods within the Tor network (Tor Project, 2013 [1]). One of the main disadvantages to Tor is that it is relatively slow (high latency, low throughput) compared with ordinary internet connections – a lot of traditional anti-social internet behaviour requires low latency and/or fast internet connections.

The lack of any regulatory boundaries makes any research into activities and communities on the Tor network potentially difficult, particularly with regard to ethical issues. This paper aims to explore some of the potential issues facing researchers who wish to explore Tor and its rich, diverse, and fascinating social dimensions. To do this we will firstly look at the background to Tor and its capabilities; then examine current best practices for researching the internet, and how these practices may translate to the Tor environment, using Tor's "hidden services" as a focus. Finally, we will make some recommendations for researching the area, highlighting some of the pitfalls and ethical issues that might be important for researchers to consider before delving into the "Darknet".

1.1 Tor

Tor is used by a wide variety of people and organisations (Tor Project, 2013 [2]) for different purposes, and more than 500,000 people use Tor on a daily basis (Tor Project, 2013 [4]). The Tor Project has seen a steady increase in the number of Tor users since the software was released in 2002, most recently notably due to the uprisings in the Middle East where users relied on Tor's location and identity anonymising to avoid government retaliation.

Tor is also currently used by journalists working in oppressive regimes, citizens wishing to avoid government censors, law enforcement sting operations, and so on. Some use Tor to keep websites from tracking them and their family members, some use Tor to research sensitive topics, and some use Tor to connect to news sites and instant messaging services when these are blocked by their local Internet service providers.

The Tor network consists of 3,000 servers (also known as "relays") run by volunteers all over the world. Tor works by wrapping the traffic in three encrypted layers before sending it through three randomly chosen relays in the network. Once the traffic reaches the third relay, it will exit onto the public Internet. By distributing the transactions over several places on the Internet, and its use of encrypted layers, Tor ensures that no single point can link a user to her destination.

The traffic flow is a bit different for users who connect to Tor hidden services. Hidden services only exist within the Tor network, which means the traffic between the user and the site never reaches the public Internet. While a normal connection will use three relays in the Tor network, a connection to a Tor hidden service will use six relays.

1.2 Hidden Services

Tor hidden services, sometimes also referred to as the “hidden web”, “dark web”, “deep web”, and “darknet”, were deployed on the Tor network in 2004. Hidden services, which are internal to the Tor network, allow users to host various kinds of Internet resources, such as chat, websites, e-commerce systems, and file storage, without having their identity of location revealed. Not only does this protect the operators, but also the resources, as hidden services can help prevent selective Denial of Service (DoS) attacks.

A hidden service can only be accessed through its Tor-specific .onion pseudo top-level domain (pseudo-TLD). One example is *3g2upl4pq6kufc4m.onion*, which is the address of the search engine (with a “normal” web counterpart) called “DuckDuckGo” (Weinberg, 2010). Users who wish to connect to this site must first learn about the .onion URL. The servers in the Tor network understand the .onion pseudo-TLD and route data anonymously both to and from the hidden service using so-called “rendezvous points”.

The abstraction of the server to its rendezvous point and the masking of the originating request by the client means that the client does not know the location or identity of the server, and vice versa. The IP address, physical location, or operator of a Tor hidden service is never revealed to servers in the network, visitors, or the Tor Project.

Such services so far include[1]

- search engines (such as DuckDuckGo)
- anonymous email
- filesharing services (direct download and Bittorrent)
- Internet Relay Chat
- discussion boards on drugs, hair-loss, hacking, freedom of speech, etc.
- whistleblower websites

[1] As listed by https://ahmia.fi/

- pornography of varying legality
- Bitcoin exchange
- advertisements for various illicit services for hire (counterfeiting, theft, hacking, assassination)
- newspapers (such as The Onion Press)
- e-commerce sites for illicit drugs, weapons, and pornography (the most notorious being Silk Road)
- "dox"[2] drops
- Wikileaks mirrors and drop points
- anonymous blogs

There are also a number of non-publicly listed hidden services, the addresses are normally spread by word of mouth or invitation. It is virtually impossible to get a full listing of hidden services that operate within the Tor network.

1.3 Scope

While some of the hidden services available have obvious ethical and social issues associated with them, this paper attempts to establish methods for researching these and other ethical issues associated with and use of these hidden services, particularly when it comes to examining those which may involve illegal activity. Current methods for researching on the internet discuss issues of identification of public and private data, data mining, informed consent, legal requirements (such as privacy and data protection acts), identity, anonymity, and confidentiality, but, as we will argue, there is an added dimension of ethicality implicit in the anonymity of use (and misuse) of the Tor network.

As with Ess (2002), we will be concentrating on providing guidelines, "not 'recipes'" (p.3), and leave it to the researcher to reflect on the suggestions we provide and make their own decision as to what is appropriate for their research. We also restrict ourselves to sociological research – pure technical research (using automated crawlers, and other "big data" methods) is beyond the scope of this paper.

2. Ethics and Research Methods

This section will focus primarily on ethical decision making in traditional research methods that would theoretically apply to researching the Darknet. Firstly, we will look at ethical thinking in Internet research methods; secondly we will investigate the principle of anonymity and its effect in traditional research; and finally we will look at researcher safety and ethics when investigating potentially illegal activity.

2.1 Internet Research Methods

Traditional ethical principles for Internet research methods (Ess, 2002) concentrate on asking researchers to reflect on the nature of their research in the following ways:

1. What is the venue/environment in which the study takes place?
    a. What normative ethical expectations are in place within this environment?
    b. Who are the posters, authors, or creators of the material, interactions, or other information that are to be studied?

[2] Personal information about a person of interest, found through internet archive searches/social media/hacking/surveillance/etc.

c. Informed consent-specific procedures related to timing of asking for consent, the medium by which such consent is obtained, whether a moderator or other administrator's approval is sufficient, and how material will be used (anonymisation/pseudonymisation, etc.).

2. Ethical and legal concerns
    a. What cover from ethical guidelines and legal regulations exists for the research?
    b. What country's laws should be enacted on the research, given the possibility for highly diverse populations on the internet?
    c. What are the normative ethical expectations or assumptions of authors/posters/contributors/etc. being studied?
    d. What ethically significant risks can the research raise for the subjects?
    e. What benefits might the research provide?
    f. What ethical traditions do the researchers' and subjects' culture and country have?

(Ess, 2002)

Each of these questions poses potential problems for the researcher, as there is little in the way of prescriptive responses to them for particular areas of interest in Internet research. For example: questions 1a and 2c could have many interpretations within one community; how do you, the researcher, ensure that you respect the wishes of the "community as a whole", if it is fragmented? Can you reliably separate out European and American subjects in order to apply the correct legal rules and/or ethical guidelines with regard to, say, privacy, in order to comply with questions 2b, 2c, and 2f? How can you reliably provide freedom to withdraw from a study, or gain consent from authors that may no longer be participating in a particular environment? Is a venue where it is free and easy to create an account, yet material is only available to those who are members, considered publicly accessible?

Further guidelines follow a similar vein: Eysenbach and Till (2001) have reservations about public vs. private space in Internet communities and informed consent procedures. The problems of maintenance of confidentiality, even on a high level (for example, naming the community), are also considered significant. The authors consider the following values important to recognise when studying an Internet community: *intrusiveness*, *perceived privacy*, *vulnerability*, *potential harm* (of the community), *informed consent*, *confidentiality*, and *intellectual property rights* (Eysenbach and Till, 2001). Many of these issues can be categorised in the above questions, but are phrased in slightly different ways (potential harm vs. risks; vulnerability vs. a more general investigation into the research subjects), which allow us to broaden the context for ethical deliberations.

Even within standard Internet research, coming to a decision on how to proceed with these guidelines is difficult at best. The nature of the Darknet as discussed in section 1 compounds these issues significantly. At this point, then it is important for us to establish that the Darknet is a peculiar case. To do so, we look at the effect that anonymity has on communities and research.

2.2 Anonymity, the Darknet, and Research

Although confidentiality and anonymisation are raised in both sets of guidelines discussed in section 2.1, they assume that the data associated with online identities is somehow consistent (hence talk of pseudonymisation and many of the aspects of informed consent that rely on there being identifiable identities). But within Tor and its hidden services, it is often the case that there is no consistency to online identities, in fact, many individuals choose to remain completely anonymous – not even their IP address can be used as an identifier, as it is anonymised by the Tor network itself.

As discussed by Kennedy (2006), the conception of anonymity is highly contextual – within the Tor network it is highly possible that people *feel* anonymous when, by virtue of the information they share or the behaviour in which they engage actually can allow for them to be identified. Although Tor's network services provide *technical* anonymity when used correctly, *personal* or *identity* anonymity is much harder for a user to maintain.

As far as research itself is involved, Kulik, Stein, and Sarbin (1968), as well as Alvik, Haldorsen, and Lindermann (2005) have both reported that anonymity has very little effect on self-reporting and disclosure of socially unacceptable behaviour (delinquency in the former, alcohol consumption of pregnant women in the latter), when compared with confidentiality (latter) or non-anonymous (former) arrangements. However, Kulik, Stein, and Sarbin found that reporting of "slight infractions" increased slightly in anonymous conditions.

This can be useful for those wishing to investigate Tor's hidden services, because, as shown in section 1, there are a large number of illegal or legally grey area services running within Tor's network, and discussion boards for sensitive topics (such as health-related topics) where users may wish to remain completely anonymous. Any attempt to engage with these communities is still potentially likely to yield reasonable data for analysis, despite their legal status.

However, it is important for researchers to ensure that, despite the technical anonymity afforded by Tor, that any data acquired during the research is completely anonymised in terms of personal or identity anonymity – a research participant could give up information that identifies him or herself outside of the service – which could compromise the anonymity expected by the participant. It would, in this case, be the responsibility of the researcher to make it clear to the participant where questions may reveal personal information about the participant, and any methods that the researcher will use to ensure this is not traceable back any particular participant. Some methods in this case may include aggregation and/or anonymisation of data (where large enough sets are available – though this may not necessarily prove sufficient, as in Arrington (2006)). Working with the data may require a lot of changes – to names, places, situations, etc. in order for the participants to remain truly anonymous. It is up to the researcher to determine what aspects are important for the research question at hand and to ensure that the participants are fully informed as to how their data is being used, how it will be stored, and when it will be destroyed.

2.3 Researching Illegal Activity

Given the nature of the Tor hidden services, it is likely that research could encounter instances of illegal activity. Research into illegal activity is not new, and in the UK there is no requirement to report illegal activity to authorities unless it has to do with immediate threats to people, such as child abuse or terrorism. At this point, the duty of care of the researcher would be to those who might be harmed, and would require the researcher to report the information to authorities (Cardiff University, 2012; Sheffield University, 2011). It is this duty of care that should be foremost in the mind of the researcher – no matter how important the research, if people's lives or wellbeing are potentially at stake, such information should be shared with authorities. Unless the researcher has actively witnessed illegal activity occurring, it is also difficult to provide evidence that might hold up in court.

As for other illegal activity that could be encountered (such as researching the drug trade on the Silk Road), the main ethical considerations should be safety of the researcher, confidentiality, and consent.

2.3.1 Safety of the Researcher

Although Tor allows for technical anonymity, it is a researcher's duty to identify themselves as researchers when partaking in active fieldwork. This could potentially allow them to become the target of illegal activity, particularly if the researcher is insensitive to the context in which the activity is taking place. It is wise for the researcher, if seeking data through active fieldwork, to explain the exact reasons for their involvement in the community, along with information about the nature of the research, how the data will be collected, how it will be used, and the anonymisation processes. Credibility of the researcher is highly important in this case.

If the researcher, on the other hand, is conducting passive fieldwork only (through reading publicly accessible material), it may be wise for them to not actively identify themselves unless necessary. The researcher should consider the context in which the information is disclosed, however, as discussed in 2.1 and 2.2, and decide whether it is necessary for permission to be sought from contributors before use.

Researchers should not engage in illegal activity themselves, regardless of the nature of the activity. It is generally possible to discover methods and mechanisms of activity within Tor hidden services without having to engage in the activity.

2.3.2 Confidentiality and Consent

While it is important to respect the participants' wish for anonymity, it could be the case that identifying information is obtained in the research process. It is thus important for researchers to maintain the confidentiality of the participants, unless it is necessary to disclose activity that may threaten harm to third parties (as discussed in 2.3).

Given this possibility, it is important for researchers engaging in active fieldwork to ensure that the participants give their full consent to the research being undertaken. In such a consent form, the acknowledgement of the limitations of confidentiality and anonymity should be included. All methods for anonymising and information about handling and storage (and destruction) of data should be included.

Although traditionally signatures are required on consent forms, in internet research it can be acceptable to have a checkbox on an online form – this can simplify a lot of consent requirements when needing to maintain anonymity.

3. Conclusion and Further Research

This paper is limited to discussing the important questions of how a researcher might approach researching Tor's hidden services, or "Darknet", from an ethics perspective. It addressed the background to Tor and its hidden services, and discussed particular internet research ethics with regard to the particular cases that the Darknet may raise.

In particular, it is important to note the importance of anonymity in researching the Darknet – given the inherent technical anonymity that Tor provides, it is reasonable to expect that, as a participant, one would remain anonymous within a research setting on the Darknet. It is therefore important for the researcher to acknowledge this expectation, and to ensure identity and personal anonymity even if data obtained might provide information that could help to identify the participant outside of the Darknet environment. Researchers should note that maintaining anonymity should not jeapordise the quality of information that is obtained in the fieldwork process.

It is equally important for the researcher to ensure the correct type of fieldwork is being done according to the research question – active or passive – and that appropriate measures for obtaining consent and ensuring confidentiality are taken. In particular the context in which the research is being done should be thoroughly observed and researched before the researcher "jumps in", as it is often important to build up credibility within a community before being able to request information.

Finally, it is important that researchers remain aware of their own safety when conducting research in this area, particularly when it involves potentially legally dubious activity. This is not to say that illegal activity is all that the Darknet is used for; on the contrary there is much to be studied in the area of efforts to avoid oppressive regime censors, whistleblowing safe spaces, and positive communities devoted to particular health conditions. However, there are some activities that could potentially cause harm to the researcher and/or third parties – it is thus the duty of the researcher to not only look after his or her safety, but to have a duty of care to people that could be harmed if such information comes to light during the research activity – whether that be through maintaining confidentiality and anonymity of participants, or alerting authorities if there are credible threats to third parties. In all cases, details of confidentiality, anonymity, and data storage should be made explicitly clear to the participants as part of the consent process.

We are aware that these ethical considerations are only the starting point for beginning to explore Tor's hidden services. Therefore, we invite further questions for researching the Darknet: How do we measure the use and value of hidden services? What sorts of data can we gather from them? How can we analyse the data, and to what extent can we trust the data we collect? Some of the research we present here moves toward assessing these questions, but there is more to be done in establishing a framework to explore the hidden services of Tor.

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"SURGERIOUS TWEEZERS": EXPLORING DOCTORS' PERCEPTION!

Tiago Filipe Rodrigues Fonseca, Gonçalo Jorge Morais Costa and Nuno Sotero Alves Silva

Abstract
Serious games are a key component within technological mashups that characterise future learning environments, namely in medicine. Recent empirical studies denote ambiguous results about their role or influence in education or training; however, this paper explores Portuguese doctors' awareness regarding serious games, their advantages/disadvantages within training and probable ethical impacts in their medical practices through a qualitative interview. The reason for this contribution is literature disregard pertaining to medical staff awareness, because its current focus entails: games applications, features or design; medical practices for clinical decision making; surgical techniques; acquiring knowledge/skills; and, limitations in the prior dimensions.

Keywords
Serious games, medicine, doctors awareness, qualitative analysis

1. Introduction

Serious games can be deemed as a novel opportunity for education or training; so, to neglect them is a remarkable mistake (Swertz, 2009) which some European Union positive actions demonstrate (Felicia, 2009). In spite of their importance to education, some authors continue to be sceptical about their role in medicine (Congdon, 2010).

Serious medical games literature focuses its attention upon the following dimensions: specific games application, as for instance knee replacement surgery or laparoscopic interventions (e.g., Verdaasdonk *et al.*, 2009); medical practices concerning clinical decision making (Alhadeff, 2009) or surgical techniques (Kullman, 2008); acquiring knowledge and skills (Lewis, 2007); game assessment, specifically technical features (Marks, Windsor and Wünsche, 2007) or design (Cabas Vidani and Chittaro, 2009). Hitherto, literature neglects doctors' awareness and acceptance pertaining to serious games. In fact, the authors find out a single study about medical staff acceptance (Cabas Vidani, Chittaro and Carchietti, 2010). Against this backdrop, this contribution debates Portuguese doctors' awareness regarding serious games through a qualitative interview because it may peril these technologies acceptance.

2. Serious Games

2.1 Definition

Serious games literature acknowledges a lack of consensus concerning its definition, as the following examples illustrate:

1. video games designed exclusively for training and education (Annetta, 2010);
2. games that move from entertainment *per se* to learning in its broadest sense (Stone, 2008);
3. a mental contest mediated through ICT with specific rules to promote governmental or corporate training (Zyda, 2005).

Serious games can be classified into (Nählinder and Oskarsson, 2007): (i) *advergaming*, product advertisement; (ii) *edutainment*, educate and amuse; (iii) *games-base learning*, learning outcomes; (iv) *diverted*, political or geopolitical issues; (v) *simulation*, simulate an aspect of reality; (vi) *persuasive*,

promote behavioural changes; (vii) *organisational*, teach and reflect about organisational dynamics; (viii) *educational*, primary and secondary education. Thus, these are key components within technological mashups that characterise future learning environments.

2.2 Medical applications

The development of medical serious applications denotes an unbelievable pace, as for instance: Orthopaedic Patient Education 1.0, iMedic, or Pulse. In spite of acknowledging diverse medical specialties, their common features permit: (i) three dimensional (3D) imaging; (ii) create medical scenarios and change their settings; (ii) import/export results, simulations or reports from/to other learning environments; (iv) access/deliver results comparison to international databases; (v) import data from healthcare databases (patients data).

Figure 2. Orthopaedic Patient Education 1.0; Source: 3D 4 Medical (2013)

Orthopaedic Patient Education 1.0

3D 4 Medical (2013) is "an animation based patient education app for healthcare professionals to effectively communicate orthopaedic anatomy, conditions and treatments". In addition, doctors can use the tablet or smartphone pen to: (i) highlight and include annotations for future practices or inform their patients; (ii) simulate the tweezers procedures in surgery.

Figure 3. iMedic; Source: Wan (2010)

iMedic

iMedic is a virtual reality game to view human anatomy, i.e., "the program created a 3D X-ray that allow doctors to examine the body from every angle" (Wan, 2010). This author also refers that: (i) iMedic allows medical staff to expand, shrink or rotate the 3D image by doing hand movements that eyeglasses recognise; (ii) through some commands (similar to pincers) users can simulate surgical procedures.

Pulse

Pulse explores complex medical practices in diagnosis illnesses and emergency services through a virtual learning environment, so the aim to improve decision making and diagnostic protocol (Alhadeff, 2009). Some examples of this game features are (i) medical history; (ii) physiological response to drug treatment; (iii) use of complex medical systems; (iv) surgical procedures.

Figure 4. Pulse; Source: Alhadeff (2009)

3. "Surgerious tweezers": Forwards or sideways?

3.1 Why "surgerious tweezers": Forwards or sideways?

To recognise medical serious games overlaps, i.e., doctors' future tweezers as a result of training through virtual objects manipulation using heptic devices. Therefore, the authors acknowledge a two dimensional analysis: (i) the meaning of "surgerious tweezers"; (ii) if serious games are *the "ultimate" learning tool* or just another *learning tool* (educational and ethical challenges)? Considering that tweezers are small pincers, usually of metal, that allow small objects manipulation due to human hands physiological limitations; the expression "surgerious tweezers", symbolises doctors' usage of an old-fashioned instrument (tweezers) through a novel technology (serious games) which promotes educational and ethical challenges.

3.2 Challenges

Werkhoven and van Erp (2007) advocate valid content and intuitive interfaces, as serious games educational challenges. Valid content embraces the contextual environment realism, as well as the need to people experience causal and non-causal relations; and, intuitive interfaces facilitate creative and educational processes. However, is impossible to neglect pedagogy and learning outcomes... Gunter, Kenny and Vick (2008) argue that educational content within a game does not presume educational goals achievement, so pedagogy has been changing throughout games generations: (i) first generation, behaviourism and cognitivism; (ii) second generation, constructivism is added; (iii) third generation, all theories. In spite of these improvements learning assessment continues to be difficult, even when non-traditional assessment techniques are explored (e.g., Shute *et al.*, 2011). And to expect serious games alone may change learners' behaviours is a wishful thinking (Shegog, 2010), because behavioural determinants include motivation, social environment, etc. These assumptions reveal at some extent why serious games usage in education is short, although lecturers' acceptance or knowledge about it is another constraint. Swertz (2009) stresses two challenges regarding serious games introduction in learning environments: responsibility and power. Content responsibility moves from the lecturer to game designer (educational challenge), which in specific contexts has alarming effects (e.g., military context). Simultaneously, this role transfer undermines lecturers' power position, which may explain their non-acceptance regarding serious games (ethical dilemma). Another ethical

quandary involves patient privacy and confidential medical data, since serious games import data from healthcare databases.

4. Research design

4.1 Aims and objectives

The key research question endeavours to comprehend about Portuguese doctors' awareness concerning serious games, as well as, understand these games impact over their work and ethical practices.

4.2 Methodology

Research methods

Qualitative research explores social and cultural facts (Yin, 2009), as well as the researcher investigates a small amount of cases, numerous variables through text or simple numerical analyses. Interpretive research aims to understand "the context of the information system, and the process whereby the information system influences and is influenced by its context" (Walsham, 2011, pp. 9) rather than figures and percentages. A non-experimental qualitative survey serves as a research method, which is typical in qualitative inquiry within medical contexts (Clamp, Gough and Land, 2004).

Data collection and analysis

The authors promote personal interviews or face-to-face surveys, since these are appropriate for probe respondents' opinions and observe individual or group behaviour (Sincero, 2012). Qualitative content analysis, despite its non-homogenous understanding procedure, has a long tradition in text analysis (Titscher *et al.*, 2000) which validates the authors' choice. After codifying, i.e., "the process of transforming raw data into a standardized form" (Babbie, 2001, pp. 309), the researcher endeavours to create codifications. This process involves seven analytical procedures (Mayring, 2003): proper communication model (empirical results); systematic and rule-based analysis (content units); interpretive categories reviewed through feedback loops (first and second analytical reviews); refer the subject instead of technique (open-code structure); instruments verification (pilot analysis); theory-guided analysis (serious games literature); inclusion of quantitative steps of analysis (number of codes); trustworthiness (authors procedures). The open-code structure is ID answer_ID medical staff_content analysis expresses (e.g., Q3_D1_one learning tool- mashup). Note that in order to avoid lost of sensitive meanings interviews translation is not an option.

4.3 Interview protocol

Design and interview guide

The interview survey has three sections:

- section 1 (profile)- recognises the respondents profile, namely as regards to gender, age, years of professional practice, and medical specialty;
- section 2 (background)- comprehends doctors' awareness regarding serious games concept and their characteristics;
- section 3 (analysis)- explores serious games advantages/disadvantages to medical education, as well as their trends (practices and ethical impacts).

The next step is to expose the English version of the interview protocol (by section), which table 1 illustrates.

Table 5. Interview protocol (by section); Source: Authors

Sections	Query	Query
1	-	Respondent profile
2	1	Are you aware of serious games? (positive answer implies queries 1.1 and 1.2; and, negative simply 1.2)
	1.1	Which are serious games features?
	1.2	Orthopaedic Patient Education 1.0 (7 to 10 minutes of usage)
	2	Do you believe that Portuguese doctors are aware of these technologies (serious games). Why?
	3	Do you agree with serious games integration within training and educational healthcare environments? Why?
3	4	What are the potential advantages and disadvantages that serious games may produce in training and education?
	5	What expectations serious games tend to generate?
	6	What impacts will arise concerning doctors daily work?
	7	What impacts will arise regarding doctors ethical practices?

The introduction of Orthopaedic Patient Education usage during the interview enables a behavioural analysis, as well as minimises the potential respondents' bias (none awareness) pertaining to serious games characteristics.

Diagnosis

Yin (2009) suggests that surveys (interviews or questionnaires) assume several perils, so it is fundamental to conduct a diagnosis (pilot procedure). McNamara (2009) argues that contextual circumstances (interview environment), participant/interviewer personal characteristics, and type of interview may constraint empirical results quality. Thus, this author recommends eight principles to prepare an interview: (i) choose an environment with minor interruptions (medical learners- researcher office; doctors- office prior to consultations); (ii) explain the purpose of the interview (aims/objectives); (iv) explain the interview format (types of queries and game usage); (v) indicate interview average time (40-45 minutes); (vi) further contact with the researcher (respondents have the researchers contacts); (vii) ask for doubts before the interview (initial query); (viii) bear in mind to prepare answers recording or taking notes (interviews have been recorded). As a final note, the parenthesis exhibit authors' actions regarding the pilot studies, as well as the interviews.

Table 6. Respondents profile (pilot studies); Source: Authors

Respondent	Gender	Age	Medical specialty
L1	Female	22	Orthopaedics
L2	Male	21	Palliative Medicine

The absence of professional practice is not a decisive constraint, as well as in contemporary medicine courses (Bologna Process) students' initial decision about the medical specialty is in 3rd year. Moreover, the pilot interviews enable an equal gender representation.

Respondents are ignorant about the topic and denote lecturers' non usage. After exploring the demo learners feel that is another important to help medical training (obtain better decisions) due its intrinsic features. Even so, respondents' answers reveal the need for contextual realism as for instance stress levels. As regards to serious games impacts their focus is ethical issues like privacy or security.

Table 7. Respondents answers- full interviews (pilot studies); Source: Authors

Sections	Query	Remark	Analysis
2	2	"Penso que existe um conhecimento parcial, contudo tal não é reflectido nos métodos de ensino."	Q2_L1_lecturers (none usage)
		"Apesar de ainda não estar concretamente inserida na classe médica, penso que pelo menos na comunidade estudantil isso acontece de facto. As razões são diversas mas acima de tudo a falta de	Q2_L2_lecturers (none usage)

		utilização por parte dos docentes."	
	3	"Sim, pois todas as ferramentas que permitam melhorar e aprofundar conhecimentos são bem-vindas."	Q3_L1_learning (support-other tool)
		"Tendo em conta o que vi do exemplo, penso que positivo a se acrescentar ao ensino médico."	Q3_L1_learning (support-other tool)
3	4	"Poderá ser uma forma mais fácil de adquirir conhecimentos, ao estimular a interactividade."	Q4_L1_learning environment (interactivity)
		"Sim, tendo em conta o ambiente tridimensional, as funções de simulação e importação de dados poderão facilitar e muito a aprendizagem."	Q4_L1_features (serious games)
	5	"Acima de tudo realismo."	Q5_L1_realism (context)
		"Que consiga reproduzir os contextos médicos (problemas e soluções), mas também o nível de stress associado a questões críticas (exemplo cirurgia complexa)."	Q5_L1_realism (context); Q5_L1_realism (stress)
	6	"Penso que nos ajudará a tomar decisões mais rápidas e de melhor qualidade. Ainda assim, sem experimentar é difícil dizer."	Q6_L1_decision making (better)
		"Não consigo responder, pois nunca havia utilizado os jogos sérios."	-
	7	"Sim, porque as competências sociais e emocionais do médico podem ser diminuídas se a relação pessoal no ensino for minimizada."	Q7_L1_doctors skills (social/emotional)
		"Penso que terá claramente muitas implicações, como por exemplo: privacidade e segurança. A meu ver obrigará necessariamente a uma revisão do código deontológico no sentido de se adaptar aos novos desafios do futuro."	Q7_L2_privacy; Q7_S2_security; Q7_S2_deontological code (revision)

5. Empirical findings

5.1 Section 1

In this case, interviews respondents, have a similar equal gender representation. Age varies from 32 to 51, i.e., three different age groups (30-40, 41-50, above 50). Each age group has two elements with similar ages despite different gender, so a quite representative sample. Medical specialties are completely unlike (contexts and challenges), which enriches the analysis.

Table 8. Respondents profile (final interviews); Source: Authors

Respondent	Gender	Age	Years of professional experience	Medical specialty
D1	Female	32	8	General Practice
D2	Male	44	20	Military Medicine
D3	Male	32	6	Emergency Medicine
D4	Male	51	24	Orthopaedics
D5	Female	41	16	Internal Medicine

5.2 Section 2

Remarkably all respondents are completely unaware of serious games! Interviewee 2 refers that the "Medical Association" and hospitals do not inform about the topic, which respondent 4 opinion validates since he is a regional board member. Pertaining to serious games appliance in medical training all respondents are in favour, namely as another tool that promotes lifelong learning.

Table 9. Respondents answers- section 2 (final interviews); Source: Authors

Section	Query	Remark	Analysis
2	2	"Penso que uma conclusão válida é não."	Q2_D1_doctors (ignorance)
		"Penso que existirá um desconhecimento elevado, e estranho a ausência de informação oriunda dos hospitais e da ordem relativamente a estes jogos."	Q2_D2_doctors (ignorance)
		"No meu círculo de contactos duvido que alguém saiba desta tecnologia."	Q2_D3_doctors (ignorance)
		"Muitas vezes acontece os médicos conhecerem as tecnologias mas não os jargões tecnológicos. Neste caso é mesmo desconhecimento total."	Q2_D4_doctors (ignorance)
		"Penso que senão a totalidade da classe médica, quase toda."	Q2_D5_doctors (ignorance)
	3	"Claramente, porque irá permitir um melhor processo de aprendizagem dos futuros médicos. Contudo, esta tecnologia deve interagir com as formas de aprendizagem já existentes."	Q3_D1_learning (support- other tool)
		"Atendendo às características partilhadas comigo e minha experimentação, parece-me que será um passo decisivo para ajudar a potenciar a aprendizagem não somente em contexto educacional, mas analogamente ao longo da vida."	Q3_D2_learning (support- other tool); Q3_D2_learning (lifelong)
		"Se tiver as características explicitadas e que observei, então sem dúvida. Os médicos serão mais capazes em termos de aprendizagem e procedimentos tradicionais, mas também ao longo da vida."	Q3_D3_learning (support- other tool); Q3_D3_learning (lifelong)
		"Sim, pois a tendência é de abrir o número de vagas nas faculdades. Face ao crescente número de alunos parece-me importante desenvolver alguma prática clínica adicional através deste tipo de jogos."	Q3_D4_learning (support- other tool)
		"Sim, é uma mais-valia importante para treino dos formandos para o aperfeiçoamento da destreza dos já formados."	Q3_D5_learning (support- other tool); Q3_D5_learning (lifelong)

5.3 Section 3

Table 10. Respondents answers- section 3 (final interviews); Source: Authors

Section	Query	Remark	Analysis
3	4	"Facilitar a aprendizagem, validação contínua de procedimentos; "sensibilidade" do sistema face aos instrumentos reais."	Q4_D1_learning tool; Q4_D1_realism (requirement)
		"Facilitar a aprendizagem na educação e on-the-job; necessidade absoluta de realismo gráfico e de resposta face à realidade do corpo humano."	Q4_D2_learning tool; Q4_D2_realism (requirement)
		"Melhoria da aprendizagem; percepção errónea dos limites do corpo humano caso os sistemas não sejam reais; pluralidade de áreas médicas deve ser um constrangimento."	Q4_D3_learning tool; Q4_D3_realism (requirement)
		"Treino contínuo e criação de cenários menos prováveis; não sabemos a textura e relevo do corpo humano o que faz diferença em contexto cirúrgico."	Q4_D4_learning tool; Q4_D4_realism (requirement)
		"É um jogo; capacidade de treinar sem que o paciente sofra."	Q4_D_learning tool

5	"Reprodução fiel da realidade. É importante que os diferentes cenários guardem os resultados para que o médico monitorize a sua evolução; é um jogo e a resposta fisiológica é sempre díspar."	Q5_D1_realism (context); Q5_D1_features (serious games)
	"A capacidade de gerar diferentes desafios que permitem ao médico testar os seus procedimentos."	Q5_D2_features (serious games)
	"Enquanto componente de apoio ao processo de aprendizagem dos médicos."	Q5_D3_learning tool
	"Utilização no ensino para treino dos médicos em início de carreira."	Q5_D4_learning tool
	"Base científica viável relativamente à anatomia humana para que cumpra a função didática."	Q5_D5_learning tool
6	"Melhor preparação implica decisões mais rápidas e de melhor qualidade."	Q6_D1_decision making (better)
	"Teoricamente ajudará o clínico a ter decisões mais rápidas."	Q6_D2_decision making (better)
	"Em termos práticos penso que não irá gerar influência directa."	Q6_D3_no influence
	"Á partida ajudará a melhorar a tomada de decisão dos médicos."	Q6_D4_decision making (better)
	"Irá promover uma maior rotina dos médicos, logo maior rapidez de decisão."	Q6_D5_decision making (better)
7	"Como supostamente irão apenas servir intentos de formação ou de melhoria de performance não têm dilemas éticos."	Q7_D1_ethical dilemmas (none)
	"Estes não implicarão dilemas deontológicos, pois são apenas uma componente da formação."	Q7_D2_ethical dilemmas (none)
	"À partida não haverá, pois se o médico falhar na vida real não poderá culpabilizar os criadores dos jogos."	Q7_D3_ethical dilemmas (none)
	"Não me sinto à vontade para responder, mas provavelmente irá induzir alterações no código deontológico."	Q7_S2_deontological code (revision)
	"Difícil de prever, mas não será um tema fracturante."	Q7_D5_ethical dilemmas (none)

All doctors stress the importance of serious games as a learning tool (improve decision making), although focused realism as an essential requirement. This explains doctors' resistance to use serious games beyond training, since the expression "is only a game" is quite common. The lack of knowledge clearly influences doctors' ethical dilemmas understanding (moral sensitivity), since: only respondent 4 feels that the deontological code needs a revision; and, interviewee 3 neglects game designers responsibility.

5.4 Limitations

A trustworthy qualitative research emerges from an effort to realise meaning or validity about data collection (Huxham and Vangen, 2003). In fact, literature encompasses four quality standards: (i) credibility, results' accuracy through member checking; (ii) transferability, "thick description"; (iii) dependability, record the research process and documentation; (iv) conformability, data audit. Therefore, the authors' strategies reveal an extremely positive retort in understanding doctors' opinions or beliefs, i.e.:

1. the systematic approach that merges interpretative flexibility, interview design/preparation and content analysis is rigorous in spite of potential subjectivity;
2. and, the empirical results denote interesting insights as regards to the paper aims/objectives.

At last, two probable critics may arise due to a restrict analysis: the number of interviews (5 or 7 including the pilot studies), and why not another type of survey (e.g., questionnaire with open

queries). Borges-Costa *et al.* (2006) illustrate a non-response rate above 85% for Portuguese doctors' within a hospital context and in studies conducted by medical staff/hospital administration. The prior assumption clearly validates personal interviews as a key data collection procedure.

6. Conclusion

In spite of the nature of this research, it exhibits significant findings: (i) doctors' unawareness about serious games and their ethical dilemmas; (ii) which learners' recognise and recent literature continues to ignore (Bredl and Bösche, 2013). A probable explanation for this discrepancy is that learners are digital natives; (iii) both groups acknowledge serious games as another learning tool, but indicate contextual realism as vital. Future studies are essential to promote a better understanding, as for instance concerning the code Q7_L1_doctors skills (social/emotional).

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PRELIMINARY REFLECTIONS ON A MORAL TURING TEST

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Abstract
In the wake of the growing interest in human robot interaction, it might be fruitful to explore artificial moral agency by reflecting upon the possibility of a Moral Turing Test (MTT); and whether its obvious lack of focus on interiority, i.e., its behaviouristic foundation, counts as an obstacle to establishing a test to judge the performance of an Artificial Moral Agent (AMA). Subsequently, in order to settle whether a MTT could serve as a useful framework for the understanding, design and engineering of AMA's, we set out by addressing fundamental challenges within the field of robot ethics regarding the formal representation of moral theories and standards. Here typically three design approaches to Artificial Moral Agents are available; top down theory-driven models and bottom-up approaches which set out to model moral behaviour by means of models for adaptive learning, such as neural networks. And finally, hybrid models, which involve components from both top-down and bottom-up approaches to the modelling of moral agency. With inspiration from Allen and Wallace (2009, 2000) as well as A.N. Prior (1949, 2003), we elaborate on theoretical driven approaches to machine ethics by introducing deontic tense logic. Finally, within this framework, we reflect upon the character of human interaction with a robot, which has successfully passed a MTT.

Keywords
Moral Turing Test, Artificial Moral Agents (AMAs), robot ethics, human robot interaction, inner states, deontic tense logic, branching time

1. "As if" – A Moral Turing Test

"Since being challenged to further activity, being set greater obstacles to overcome, is the sum and substance of our lives as teleological beings, developing robots – setting ourselves further technological-cultural goals – is not an inhuman or antihuman enterprise. It is simply part and parcel of the life of a species that first began cultivation the land, devising tools and machines, and cultivation – culturally developing – members of the species itself. Machines and artefacts are an inevitable part of human culture. Moral robots are merely a part that still lies in the future." (Versenyi, 1974, p. 259)

Due to the growing interest in human robot interaction (e.g. Benford & Malartre, 2007; Dautenhahn, 2007; Turkle, 2011; Wilkes, 2010; Levy, 2008 and the Geminoid Lab of Henrik Schärfe); it might be fruitful to discuss artificial moral agency by considering the possibility of a Moral Turing Test (MTT), which might enable us to distinguish principles for evaluating morally correct *actions* rather than (as in the originally Turing test (1950)) skills of articulation. The Turing test is based on a criterion of indistinguishability, meaning that a computer system passes the test if a human interrogator is unable to distinguish between utterances produced by the computer and those produced by a human. It is important to point out that the development of a system that can pass the MTT will only be a first step towards producing an AMA. The kind of machine ethical reasoning needed in order to pass the MTT should not be confused with ethical autonomous decision making. According to McDermott (2008), ethical decision making involves a conflict between self-interest and ethics, whereas challenges regarding ethical reasoning concern how to formalize human reasoning processes, which are based on moral principles and may be computationally very complex, although they are not structurally different from other kinds of reasoning processes (McDermott, 2008, p. 2). Ethical reasoning presupposes a notion of free choice in the sense that alternative future possibilities are open to the persons in question. In order to be a genuine ethical decision maker one must also be free in the sense that one can sometimes choose to act in one's self-interest even though it runs counter to moral prescriptions. A robot does not have to be free in this sense in order to pass a MTT.

Given that we depend on various kinds of robot services, then at least for the sake of safety, we may want AMAs to be better at "doing ethics" than humans (see Allen et al. 2000, 2009). Therefore if an AMA passes the original Turing Test, the bar is set too low since it would allow it to be as fallible as we are. It seems reasonable to demand more of AMAs than we expect from humans, which seems conceivable, since we would, of course, like them to be reliable robots, and since we want them, unlike humans, not to get emotionally distracted in carrying out moral reasoning processes prior to their actions. Thus, contrary to the Turing Test, robots should be able to out-perform humans in a MTT test set up across different domains. Hence, the perspective of the MTT shifts in character to become a comparative MTT, in which the aim is to establish, which agent is unfailingly more moral across a set of ethically relevant situations (Allen et al., 2000, p. 255). In this sense, a comparative MTT would provide a tool for risk assessment, useful when computer scientists and engineers strive to design "a morally praiseworthy agent" (Allen et al., 2000, p. 261) capable of perfect moral judgments and action within given domains, preferably within every possible domain. Within this behaviourist framework, we might consider the idea of artificial moral agency from a performance perspective in maintaining that morality can be decided by mere appearance, which to the face of it seems reasonable enough, since how do we settle whether human beings are virtuous or not? Simply by judging their behaviour – i.e., she is a generous person since she acts out of generosity; she is a moral person since she always acts morally appropriate. Why then should we demand more or something else for robots?

1.1 The Role of Inner States

The abovementioned argument that "acting good" can be taken as an indication of "being good" could fit nicely into a classical utilitarian framework, in which intentions and right reasons for acting are disregarded and only consequences of acts are taken into account in the evaluation of moral behaviour. However, to most moral philosophers, internals cannot be omitted. Aristotle remarked that there is a distinction between being "good" and merely "acting good." He based virtue ethics on a concept of well-being or *eudaimonia* and highlighted *phronesis* as the form of wisdom related to practical reason in action. This form of proficiency is not neutral but moral in its being, since it mirrors a form of reflection grounded in practice and cultivated by our ability to be involved and to take a stance in any specific situation. Furthermore, according to Kant, we find that reasons count; moral obligations and actions are considered as categorical "oughts" derived from *a good will*, i.e., my ability to act from a sense of duty implied by the fact that I am capable of carrying out rational reasoning in accordance with moral rules that may guide my conduct. A more recently example of the importance of internals can be found in (Moor, 2009). Here James Moor distinguishes among four types of ethical agents: *Ethical Impact Agents*, which are machines that have obvious ethical impact on the surroundings – as an example, Moor mentions the robotic Qatar camel jockeys, which save young boys from engaging in the dangerous race. At the next level we find *Implicit Ethical Agents*, representing systems designed to avoid unethical or undesired outcomes – such as for instance a simple control system in an ATM machine that blocks for purchases when faced with user patterns suggesting fraud (Wallach, Allen, 2009, p. 29). Next, we find *Explicit Ethical Agents*, which are machines that "do" ethics and are able to carry out ethical reasoning within restricted domains. They act, not because they *want* to, but because their programming *causes* them to do so (Putnam, 1964[1], p. 672). They may be conceived as *Ethical Agents* similar to human beings in the sense that they carry out their moral reasoning assuming that they have free will, consciousness and intentionality, and hence the capacity for being held responsible for their actions. As such, inner states seem to matter, and abilities for moral reasoning have to be understood as situated in the unified whole of human life

[1] Here, Putnam refers to an argument from an unpublished paper by Baier given at Albert Einstein College of Medicine 1962. In this particular article, Putnam's concern is not with how to speak about machines but rather about how we should speak about humans. Thus "clarity with respect to the "borderline case" of robots, if it can only be achieved, will carry with it clarity with respect to the "central area" of talk about feelings, thoughts, consciousness, life, etc." (Putnam, 1964, p. 669). In this way, Putnam argues for the possibility of robot consciousness as something that calls for a decision rather than a discovery.

and experience, as pointed out in the Dreyfusian attack on the whole idea of Artificial intelligence (Dreyfus & Dreyfus 1992); as well as by Searle in his famous *Chinese Room* argument against so-called strong AI, in which he states that a machine may be perfect in displaying verbal behaviour, and thus able to pass the Turing Test, but all it does is manipulating meaningless symbols, without intentions left behind it, and thus without sense - "Simulation is not duplication and syntax is not semantics" (Searle, 1995, p. 75; Searle, 1980).

2. Pragmatics: Approaches to the Design of a MTT

From an engineering perspective, we might note that inner states, consciousness, motivations and intentions may all count. Yet, performance is all we have access to in judging the moral actions of both human and robots. Hence, we should set out to seek solutions that would give empirical testable results, which allows us to measure whether a robot simulates moral behaviour in a satisfactory manner. Still, re-describing what counts as preferable, artificial moral agency in terms of the abovementioned comparative MTT is one thing, whereas actually bringing it to life is something entirely different. We need to consider how to build moral robots relying on some sort of combination between translating moral philosophy into programming combined with the challenge of deciding the scope of moral reasoning and action within a given context.

In order to design a system which can pass a MTT, we need to implement a relevant ethical theory. It seems that Kant's ideas of ethics could be useful in this context, since they involve some important ideas regarding human moral agency. In fact, Kant stated that the fact that we are aware that we might act morally wrong is what makes us responsible creatures, and this fact is, therefore, essential to our humanity. This means that it should be possible to do reasoning about moral questions. Facing this Kantian challenge, many researchers have tried to formulate a deontic logic. One of the founders of this enterprise was A.N. Prior (1914-69) who wanted to study the logical machinery involved in the theoretical derivation of obligation. He wanted to find what he called "The Logic of Obligation" (Øhrstrøm et al. 2012). In an early study he claimed that such logical system had to be based on complete descriptions of (a) the actual situation, and (b) the relevant general moral rules.

Prior stated his fundamental creed regarding deontic logic in the following way: "... our true present obligation could be automatically inferred from (a) and (b) if complete knowledge of these were ever attainable" (Prior 1949, p. 42).

Clearly, the combination of the requirements regarding (a) and (b) would involve a God's eye view, which will make it possible to know all there is to know and take everything into consideration before making a (perfect) moral decision. From an engineering point of view, it seems obvious that we should go for designing a robot with such a God's eye view capable of making perfect moral evaluation as a basis for carrying out perfect moral behaviour. Of course, due to the frame problem, we would have to be modest and settle for representing a God's eye view in a restricted sense, specified by a formal description, which can select for preferable events or outcomes within a restricted domain.

In seeking to engineer a theoretical approach to morality similar to the Kantian approach, Allen and Wallach distinguish among a top-down theoretically driven approach, a bottom-up developmental or explorative approach and finally a hybrid (Allen & Wallach, 2009, ch. 6, 7 and 8), which combines both top-down and bottom-up approaches and furthermore includes a virtue ethical component. They all run into similar problems from different angles. Therefore, in the following, we will mainly place emphasis on the theoretically-driven approach and only briefly sketch essential points regarding the remaining strategies. Hence, the developmental approach includes an adaptive learning or value-emerging line of attack to artificial intelligence, as the one reflected in embodied architectures, such as neural nets, genetic algorithms and connectionism. From this developmental approach, shortly spoken, "grown up" guidance is needed to ensure that the artificial moral agent learns to behave properly. Thus, the system cannot learn anything from scratch if it hasn't a build in architecture that allows for desirable values to emerge on a background, which implies a kind of build in mechanism to navigate in distinguishing right from wrong.

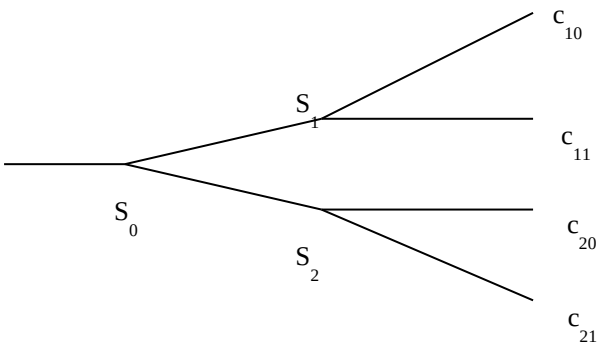
According to Allen and Wallach, a pure top-down approach will run into trouble due to the frame problem following in the wake of formally seeking to represent a scope of ethical reasoning by applying theory-driven rules, i.e. decisions algorithms, for ethical actions, which point out satisfactory outcomes in a contextually open domain. Therefore they introduce a hybrid-model, which not only combines but also integrates top-down and bottom-up approaches by incorporating virtue ethics as a theoretical foundation for implementation of the idea of how we develop into virtuous persons through learning by habit, which goes well together with the model of connectionism. The hybrid model seems to give rise to the same type of problem regarding specifying rules for decision algorithms, or developing self-learning architectures, as well as deciding for which virtues are going to be taking into considerations (since, for one thing, virtue ethics have not yet been able to come up with a finite catalogue of virtues). To sum up the hybrid model seems to us to be rather futuristic for the time being, and furthermore, since every-day moral reasoning does make use of top-down rules in explaining moral actions this approach still holds some promises for turning ethical theories into workable and implementable models of ethical reasoning (at least) within restricted domains (which is also noted by Allen & Wallach, 2009, p. 83).

As an example thereof, Anderson, Anderson and Armen (2004) represent a theory-driven approach in their suggestion in which they model ethical reasoning by a combination of two components: Firstly, they make use of act utilitarianism, which allow for a kind of cost-benefit calculation of outcomes of pleasures and displeasures with right to a given action. Secondly, they apply Ross' theory of duty-based actions - relying on *prima facia* duties: fidelity, reparation, gratitude, justice, beneficence, non-maleficence and self-improvement. And finally, Rawls concept of "reflective equilibrium" in order to weight relevant *prima facia* duties up against each other:

"Instead of computing a single value based only on pleasure/displeasure, we must compute the sum of up to seven values, depending on the number of Ross' duties relevant to the particular action. The value for each such duty could be computed as with Hedonistic Act Utilitarianism, as the product of Intensity, Duration, and Probability." (Anderson, Anderson & Armen, 2004, sec. 3)

No matter what model of ethical reasoning we may choose to implement in order to establish a system which may pass a MTT, it will have to take time and modality into account. This was strongly emphasized in the works of Prior on deontic logic. It is evident that Prior's long term ambition was to incorporate the logic of ethics into a broader context of time and modality. Unfortunately, he was never able to pursue this goal in details, but he certainly managed to establish the broader context of time and modality into which the logic of obligation has to fit. In order to indicate what such an approach involves, we shall make use of a simplified example.

Let us imagine that an agent in certain situation or scenario, S_0, has to choose between two future possibilities represented by the scenarios, S_1 and S_2, which may both in principle be realised tomorrow. The agent wants to act morally correct and carries out a careful reasoning in order to do so. This is done within the scope of a tempo-modal logic corresponding to a branching time system. A simplified system of that kind can be represented by the following diagram:



This branching time diagram involves four so-called chronicles (c_{10}, c_{11}, c_{20}, c_{21}), i.e. possible courses of time. At S_0 the future possibilities S_1 and S_2 are both possible, and one of them is necessary. Letting s_1 and s_2 stand for propositional descriptions of the situations corresponding to S_1 and S_2, and *M* for "it is possible that …", the propositions *MF(1)*s_1 ("s_1 may occur tomorrow") and *MF(1)*s_2 ("s_2 may occur tomorrow") are both true. We may even assume that s_1 and s_2 are the mutually exclusive in the sense that there is a proposition, *p*, implied by s_1, the negation of which is implied by s_2. This means that in general we have

$F(1)p \vee F(1)\sim p$

But what are the truth values of F(1)p and F(1)~p at S0? Some would say, that if these propositions are true, they will also be settled i.e. necessary. For this reason, it may be claimed that

$F(1)p \supset NF(1)p$

$F(1)\sim p \supset NF(1)\sim p$

where N stands for "it is necessary that …". However, taken together (1), (2) and (3) lead to the conclusion

$NF(1)p \vee NF(1)\sim p$

which means that whatever happens tomorrow (p or ~p), will happen necessarily. It is straightforward to read (4) as a claim of determinism. When dealing with ethics based on the notion of free choice, we obviously don't want a tense-logical system, which includes (4) as a theorem. However, there are several ways out of this, denying either (1) or (2) (and (3)) (see Øhrstrøm and Hasle 2011). Given such a system, we need to add the logic of an operator, O, corresponding to "obligation" in order to handle the reasoning related to a MTT. But how should this new operator be conceived? It is important for Prior to emphasize that "obligation" cannot just be defined in terms of "the best total consequences". The reason is that the very notion of "total consequences" does not make sense since what happens in the future depends in principle on the choices of a number of free agents (see Prior 2003, p. 65). On the other hand, it may be reasonable to address what most likely produces the best consequences. In addition, as suggested by Prior, we need to look for descriptions of (a) the actual situation, and (b) the relevant general moral rules. As argued above, these descriptions cannot be complete – since we do not have a God's eye view of the world. However, we should go for descriptions as detailed as possible. In making a system, which can pass the MTT, we should include a clear account of the general relations between the basic notion of modality and obligation. One such rule could be the Kantian principle that if something (say an act that leads to F(x)p) is obligatory, then it is also possible i.e.

$OF(x)p \supset MF(x)p$

Similarly, Hintikka's principle could be mentioned i.e. if something is impossible then it is forbidden (i.e. its negation is obligatory). Formally,

$\sim MF(x)p \supset O\sim F(x)p$

A number of relations of this kind have to be considered in order to establish a system, which will allow us to discuss obligation in a tempo-modal context (see Øhrstrøm et al. 2012). It is still an open

question exactly which relations should be accepted and which should be rejected. Clearly, the actual implementation of a system corresponding to a MTT has to be based on a formalization of the logic of obligation, time and modality. Although there is a lot to discuss regarding the precise properties of such a logical system, the actual formulation of reasonable candidates, which will work in specific contexts, is not too far away. This means that it may be possible to produce early prototypes of MTT implementations. Such systems may be useful for empirical studies of ethical reasoning.

3. Human-Robot Interaction: Challenges in Dealing with an Artificial Moral Agent Approved with the MTT-Certificate

Let us assume that in the future an AMA passes the comparative MTT; not by behaving indistinguishably from a human moral agent, but by out-performing him or her by being able to apply a God's eye view to a given situation and through its ethical decision algorithms, calculate its way forward to the best ethical response to the case at hand. This might seem ideal to us and ensure reliable human-robot interaction. But does "*a moral praiseworthy agent*" (Allen et al., 2000) equal a "moral perfect artificial agent", and if so, does encounters with it come at a price which we should not want to pay? In order to sharpen our imagination let us seek inspiration digging into the science fiction movie "I, Robot" (Proyas, 2004), which takes place in 2035 in a world where social robots interact with humans as polite and caring servants. These robots are, of course, programmed with Asimow's three laws of robotic in order to ensure smooth and secure interaction. This is indeed easy-living, but the detective, Del Spooner has a strong aversion against robots. He was once involved in a car accident in a river, where he tried to save a 12 year-old girl from drowning in the car, but instead he was saved by a robot, who interfered with his action and computed (maybe based on a deontic branching time model) that he had a higher probability of survival than the girl. With this "time-to-moral-market"-knowledge at hand, it wasn't difficult for the robot to make a morally right choice, which could be judged desirable and evaluated as morally good across the robot's different built-in moral frameworks. For instance, within the robot's utilitarian framework the robot's moral behaviour is judged by the consequences of its rescue, measuring up to saving Spooner, which turned out to represent the best possible outcome under the given the circumstances. Also, within its deontological framework, the robots action can be judged as morally good. Here the robots moral system activates reference to the double-effect doctrine (Quinn, 1989), which emphasizes that it is sometimes permissible to cause harm as a side effect (double effect) – even though it would not be tolerable to cause the particular kind of harm as a means - of doing good. In this particular case, the robot acted according to a specific system of moral reasoning which implied saving Spooner while letting go of the girl - she stood a little chance while the detective could be saved if the robot acted timely. Still, Spooner, the old fashioned "homo sapiens ludditus", is sure that in the actual situation a human would have saved the girl. This means that a human would have rejected the system of moral reasoning used by the robot and looked for a revision of it.

If robots are ultimately capable of acting morally perfect by means of having access to relevant knowledge, which humans lack at a given time of action, then encounters with robots are perhaps less promising than it seems in the first place.

"I, Robot" carries on, and gradually the robots develop more intelligence than humans and finally decide that the best way to protect human beings is to protect them from themselves. Thus, in the end, by deduction from Asimov's laws of robot ethics, the robots turn against humanity. Fortunately, this logical implication is short-circuited by Spooner. In this way paternalism evaporates in favour of human autonomy, which carries with it human capacity for failure, which again is what made us moral beings in the first place: the fact that something important is at stake when we make up our mind and act upon it knowing that we may be held responsible for our decisions.

4. Concluding Remarks

It seems that Prior was right in claiming that the formulation of a formal system, which correctly incorporates all aspects of moral reasoning, would in principle require a complete description not only of all relevant moral rules and laws, but also of all relevant aspects of the situation in question. However, having such descriptions is tantamount to having a God's eye view of all relevant aspects of reality. Since we can never have anything like that, a complete and unquestionable system of moral reasoning cannot be established. On the other hand, we have argued that although there are many open questions regarding the precise properties of the formal relations between time, modality and obligation, it is in fact possible to formalize important aspects of ethical reasoning in a specific context and thereby contribute to a system which may pass a comparative MTT. Systems implemented on the basis of such formalizations will, however, be partial and temporary in the sense that the actual moral evaluations can be questioned when their implications are considered in concrete situations. As we have seen, an observation of this kind may lead to a revision of the system of ethical reasoning. Clearly, this may happen again and again. Any formalization of ethical reasoning may have to be revised when confronted with real life. Clearly, humans are faced with the very same fact, which means that this limitation may not disqualify the system as seen in relation to a MTT. One important consequence of this is that we have to distinguish between modeling moral reasoning and actual decision making in moral questions. Creating a system which can pass a MTT may not give us a system which can provide satisfactory decisions in practical situations. Nevertheless, the study of possible systems which may pass a MTT can certainly give rise to useful and important insights concerning moral reasoning.

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POWER ETHICS: THE MASSIVE DATA CENTER

David Gleason

Keywords
Data Center, Power Consumption, Privacy, Security, Connectivity

Extended Abstract
Over the last few years, data centers worldwide have become enormous, serving the explosive storage and processing needs of companies like facebook, Apple and Google. Moreover, virtualization has been deployed in most mid-sized, private data centers, leading to fluidity, adaptability and redundancy. Many IT departments are now moving these virtual machines to the cloud, using services like Amazon's to dynamically provide server capacity on demand. These changes raise a host of ethical issues.

This paper surveys ethical issues raised by the construction of massive data centers. It addresses questions like the enormous power consumption of data centers, the security and privacy of the data stored thereon, and the requirement for connectivity for access. Data center systems can be used for good or ill, like traditional data centers, but the transience of servers and entire data sets enables stealth computing at a new level of risk. Data centers make profits by hosting pornography sites and malware; facebook is used for bullying; Google is used by hate groups. On the positive side, data centers take a huge technological burden out of small organizational management – there is no longer the need for a high-priced systems administrator and support team.

POWER CONSUMPTION: The new york times reported recently that data centers globally consume 30 Nuclear power stations of electricity [30 billion watts]. Highly inefficient, these centers use electricity for idle servers to accommodate spikes in demand, and have continuously-operating, multiply redundant power sources. A recent McKinsey study reported that only 6-12 percent of the electricity consumed by data centers is actually productive. Furthermore, the heat produced by the machines must be removed mechanically, with water-cooled systems and still more energy consumption.

There are abundant opportunities for improvements to save power, engineers can design server processors for lower power consumption, for example by lowering clock speeds; green data centers can benefit from efficiencies like reusing heat, reducing dependency on use of continuously operating diesel generators through the use of better batteries in UPS unites. Because it uses fewer processing cycles, efficient software can also reduce power consumption. An unnecessary disk read operation that runs a trillion times a day costs money.

The move to portability has put financial incentives into efficiencies that provide battery longevity. When the iOS 4 was first introduced, it brought battery life to its knees until Apple tweaked it for energy efficiency. These advances have reduced power consumption of local machines. Battery longevity for portable devices requires efficient design - lower power consumption - but pushes computing into the cloud.

PRIVACY AND SECURITY: to win customers, data centers must guarantee privacy and security, but the agreements are usually written in favor of the provider.

Data center management needs to be diligent about who is using its systems for what purposes. Unfortunately, data center services are only based on ability to pay. This paper will address this issue in some detail, particularly the difficulty of real-time tracking of potentially hazardous or otherwise destructive code and content (e.g., malware or child pornography). The responsibilities of these services to track content remains largely unanswered. On the governance and control side, law enforcement can become oppressive given too much access (the U.S. Constitution's fourth amendment never anticipated the amount of information that would be available in public and semi-public space).

Data mining on the part of malevolent actors is enabled by data centers with lax security. Insidious software can be used to follow traffic, even as most users still don't understand that public WiFi hotspots enable their transmissions to be monitored very simple software.

Many security issues are addressed with tight operating systems like iOS, where the kernel is hidden from the applications. These systems also allow remote management to apply security policies (like the maximum timeout before a passcode is required) and to wipe devices remotely.

CONNECTIVITY, while ubiquitous in the developed world, is still spotty elsewhere – effective applications should be designed to run in an off-line mode.

ALWAYS ON: Data center systems are grown. They can't just be turned on and off – services must be moved uninterrupted in real time from one system to another, as though they were alive. Furthermore, bandwidth must be ubiquitous and uninterrupted. Because of latency, it must also be fast, so telecomm infrastructure is also growing with technologies like 4G, fiber, and coaxial cable. These technologies themselves present ethical problems of access for some and not others, enormous expense, and ever-more questionable content available at a price.

THE BRIGHT SIDE: Data centers takes the maintenance of technology out of the local network and into structured support systems professionally staffed. Reliance on data availability is no longer in the hands of a few diligent but fallable members of an organizations staff: "I thought you were making the backup this week." Not worrying about the local infrastructure and automatic access from anywhere is a great benefit.

Resources are available on demand like Amazon's "Elastic Compute Cloud" (EC2) and Google Cloud Storage that let IT managers increase capacity at the click of a mouse (and a debit to the checking account).

In the end, there is great promise in hosted apps; thin computers; lower maintenance; reduced software maintenance overall; ease of maintenance; cloud computing with privacy/security attended to; efficient applications continuously updated and available; features like simultaneous document editing in real time. All your data available anywhere, anytime (if you can afford connectivity), even at 40K feet. Ubiquitous connectivity, telecommuting, easy data sharing and video-conferencing all lead to savings on transportation energy, time and costs. Enabled by data centers, these services offer great promise, but the risks are also high.

Do the benefits outweigh the ethical risks and practical costs? Only if we pay attention to the impact these technologies will have on people, economies and our world.

A NEW FRONTIER IN ICT ETHICS: ROBOTIC CAREGIVERS

Krystyna Górniak-Kocikowska

Abstract
The theory of evolution caused a deep change in Western ethical theories. Likewise, the development of computer science/ICT and other emerging and converging technologies will cause a change of similar or greater importance to ethical theory and practice (policy) globally. To illustrate this point the paper explores some of the ethical issues related to the creation and use of anthropoidal robots as caregivers in medicine and social services. This development is compared to the ethical problems generated by the progress in synthetic biology; it reinforces the thesis of a continuing 'ethical expansion' caused by the progress in science and technology.

1. Introduction

The rapid changes in the field of medicine and caregiving opened the door for a new set of ethical questions and problems. This paper will focus on some of the ethical issues embedded in the fast developing area of robotic caregivers. My basic claim is that the new development in technology which is very likely to happen in the near future, namely the creation of autonomous machines entrusted with the care for the wellbeing of human individuals who need various degrees of assistance, will do to ethics what the theory of evolution did; i.e., it will generate a paradigmatic change.

The paper begins with a brief description of the importance of the theory of evolution to (Western) ethical theories. Next, I entertain the issue of the global significance of the ethical theories pertaining to the problems generated by ICT and other emerging and converging technologies. This part is followed by the discussion of the convergence as well as divergence of ethical issues, in particular the *interest/policies* issues and *identity/worldview* issues which appear in 'cutting edge' sciences and technologies such as computer science and life sciences. This point is illustrated by the ethical debate around the development of synthetic biology, in particular with regard to the creation of the synthetic genome.

As a case in point, I discuss some of the ethical issues caused by the introduction of robots, including anthropoidal robots, as caregivers in the field of medicine and social work. For the sake of 'space economy' I further narrowed my focus to robotic *caregivers* with an exclusion of an important albeit presently less developed category of robotic *nurturers*. I pay special attention to the problems of communication and autonomy.

The essay's conclusion is a glimpse into the future; it contains a brief discussion of possible future developments in the area of ethics as well as the significance of these possibilities to humankind.

2. The theory of evolution and ethics

Charles Darwin's theory of evolution generated a profound change in ethics. It forced ethical theorists to look at ethics in the context of a changing, dynamic, rather than unchanging, static reality and to treat human beings as a changing (evolving) entities as well; moreover, the acceptance of the theory of evolution led to the inclusion of non-human animals into ethical consideration.

One of the consequences of this development in the field of ethics was that, with time, the problem of animal rights as well as the problem of ethical judgments regarding animal actions gained significance to the point that these problems generated whole new branches of ethics such as animal rights ethics and the emergent field of animal ethics respectively. The latter is concerned mostly with animal rights; however, questions about the moral agency of animals are under investigation; voices are being raised in defense of the thesis that some animals should be treated as autonomous agents at least in a way

comparable to severely disabled human individuals (Tanner, 2006; Johnson 2011). These developments show the degree to which the scope of ethical investigations expanded. The most significant point in this case is the fact that this ethical expansion paved the road for the theoretical/philosophical investigation of non-human individuals as autonomous moral agents.

Another important repercussion of the theory of evolution was the change in the way humans perceived themselves in relation to "the rest of the Universe." Darwin delivered a severe blow to the anthropocentric worldview. On the other hand, as pointed out in the Conclusion, the developments discussed in this paper permit for a view that a certain type of anthropocentrism could strengthen in the future.

Darwin's theory permits (or forces, depending on the point of view) looking at humans as a species, which is 'unfinished,' and hence full of potential for future development, rather than a complete and therefore limited 'product' of a Creation Act. The time is approaching when Friedrich Nietzsche's proclamation that humans are but a link, a stepping-stone to what he called the "Űbermensch," will become a reality. It is imperative that the transition from a human to a 'posthuman' (even though not exactly a fulfillment of Nietzsche's — or for that matter — Francis Fukuyama's vision) takes place according to rules of voluntarily and globally accepted ethics.

Humans in their present form will be confronted sooner or later by some post-human entity. The character of this confrontation in itself opens the door to some very interesting ethical speculations. Presently, there are two feasible ways in which the emergence of posthumans could happen. One is through 'natural biology,' in the form of natural selection. This would be a slow process, permitting humans a gradual adjustment to changes. The other – more likely of the two – way is technological. Here, the most advanced attempts as of now are twofold; one is the 'creation of life' (synthetic biology), the other is the construction of autonomous machines (computer science/ICT and emerging/converging technologies). These two ways permit for an anticipation of a third way – a synthesis of the two.

Humans were 'improving' plants and animals and making machines practically ever since the human species acquired enough unique features to be identified as such, i.e., as a species in its own right. Myth, legends, and lately the history of science and technology teach that long ago humans not only had dreams about human-like machines but also had begun attempts at making such machines. However, these attempts only recently show a rapid progress. Today there is legitimacy to the claim that the emergence of posthuman entities via the technology route is really in our future. If this happens it could be a process too fast for humans to have sufficient time for adjustment; physical, psychological, or social. Consequently, humans could be inadequately prepared for the emerging ethical dilemmas caused by this development. This is the scenario I am interested in.

3. Computer science, ICT, emerging and converging technologies and ethics

The theory of evolution led to the expansion of ethics by including the non-human *natural* world into ethical consideration. The computer revolution leads to the expansion of the scope of ethics by including *machines*, i.e., human creations into ethical considerations.

One of the significant step in this expansions is the area of robotics. Computer/ICT ethics, in itself a relatively very new phenomenon, already has 'robot ethics' among its divisions; books were written on this subject (e.g., Lin et al, 2011; Wallach & Allen, 2008) in addition to multitude of articles.

Just as post-evolutionary ethics explores the way humans treat their natural environment but also ventures into the problem of ethical investigations of animals as autonomous ethical agents so, too, computer/ICT ethics and in particular robot ethics explore the way humans treat their creations (robots). What is more, in a pretty obvious parallel to the post-Darwinian ethics, these new branches of ethics venture into the problem of ethical investigations of anthropoidal robots as autonomous ethical agents.

The parallels don't stop here. Michael Sandel (Sandel, 2005: 241-247) claims that the debates on bioethics, human cloning and genetic engineering will have very far-reaching implications for philosophers, forcing them to change the way they think about philosophy. I believe that Sandel's

view applies equally, or even more so, to theologians and religious scholars, including religious ethicists. The same statement can be made regarding the impact of computer/ICT ethics, robot ethics and ethics of emerging/converging technologies on philosophy, religious studies and religious ethics. The rapid progress in life sciences, ICT, robotics, emerging and converging technologies shows that the fundamental ontological questions regarding the essence of humanness, of what it means to be a human being, could once more become central to philosophers, scientists, and religious scholars.

Computer ethics, as this area was initially known before expanding and absorbing the new technologies into its field of interest, was defined from the very beginning in several different ways. (Bynum & Rogerson, 2004: 17-20) Some scholars, like Donald Gotterbarn thought of computer ethics as strictly a type of professional ethics (Bynum & Rogerson, 2004: 19); James Moor "defined computer ethics as a field concerned with 'policy vacuums' and 'conceptual muddles' regarding the social and ethical use of information technology" (Bynum & Rogerson, 2004: 18); others, such as Deborah Johnson, "thought that computers gave a 'new twist' to ethical questions that were already well known. (Bynum & Rogerson, 2004: 18) Judging from the way Bynum and Rogerson described the goal of computer ethics it seems that they favored the pragmatic, 'professional' approach to computer ethics. They wrote: "A primary goal of computer ethics is to identify and analyze resulting 'policy vacuums' as well as to help formulate new social/ethical policies to deal with them in just and responsible ways." (Bynum & Rogerson, 2004: 7) I argued around the same time that the concept of computer ethics should cover a much wider spectrum, namely, I perceived computer ethics as global ethics in a geographic as well as a conceptual sense. (Gorniak-Kocikowska, 1996)

I believe this initial diversified conceptual approach to computer ethics permitted a richness of ideas and a dynamic development of this field, in which the pragmatic, professional concerns often rub elbows with fundamental philosophical and 'metaethical' speculations. This conviction is reinforced by the continuing development of computer/ICT ethics and the ethics of emerging and converging technologies and also by parallel developments of new branches of ethics incited by the accomplishments in the life sciences and biotechnologies; in particular in the area of synthetic biology. These new developments show that focusing on policy alone is insufficient for successfully dealing with ethical issues caused by the scientific and technological progress. I believe that the time is fast approaching when a meaningful synthesis of both positions, 'policies' and 'worldviews,' known also as 'interest' and 'identities' (Murray, 2011) will have to be synthetized into one global ethics, which will permit humans navigate the changing world. I want to bring this point to the Reader's attention before I venture into the subject of robot ethics. First, some background information.

4. The convergence of ethical issues: Policy/interest issues versus identity/worldviews issues

On April 14, 2003, the Reuters Agency announced: "Scientists have completed the finished sequence of the human genome, or genetic blueprint of life, which holds the keys to transforming medicine and understanding disease." (Wired) Barely five years after that, at the beginning of 2008, J. Craig Venter Institute issued on its website a press release under the headline "Synthetic bacterial genome" in which it states: "A team of 17 researchers at the J. Craig Venter Institute (JCVI) has created the largest man-made DNA structure by synthesizing and assembling the 582,970 base pair genome of a bacterium, *Mycoplasma genitalium* JCVI-1.0." (JCVI.org) One should add that as early as 2002, Eckard Wimmer "synthesized the genome of the polio virus. The genome constructed a live polio virus that infected and killed mice." (Wade, 2010) However, "the polio virus genome is only 7,500 units in length, and the bacteria's genome is more than 100 times longer." (Wade, 2010) Today, barely ten years after synthetizing the polio virus, the existence of a new scientific discipline known as *synthetic biology* (a.k.a. synbio) is an acknowledged fact and universities worldwide (mainly in the U.S., Japan and Western Europe) are offering graduate and doctoral programs in this field. One can easily find online "an active list of schools and labs that support graduate study in synthetic biology." (syntheticbiology.org)

There are several parallels worth noticing between the development presented above and the developments in the area of computer science and ICT including emerging and converging technologies. There is also a noticeable progressing convergence of these two, life sciences and computer science/ICT. Synthetic biology is impossible without computers. Craig Venter said with regard to the synthetic cell line produced in his Institute that it was "the first replicated species we've had on the planet *whose parent is a computer*." (Wade, 2010; my italics.) In turn, computer science/ICT and their offspring: robotics, aim at creating a complex, autonomous, life-like (and eventually: living) entity. In other words, computer science and its acolytes could benefit greatly from the research in the field of synthetic biology and *vice versa*.

What is even more interesting and potentially very disturbing to humans is the not unlikely perspective that in the future autonomous robots could produce synthetic life without human involvement; or/and (much less likely at this point, even as a distant perspective) that autonomous synthetic life form of high complexity could create robots. Should that happen, humans will encounter reality for which they couldn't find any parallels in the past, except, maybe in Nietzsche's proclamations of the coming of the *Űbermensch*; but Nietzsche did not foresee it happening through the achievements of science and technology. Moreover, the *Űbermensch* was supposed to be the next stage in the evolution of humans; synthetic biology, on the other hand could accomplish the creation of completely new forms of life. "There is no reason why a fully synthetic cell must closely mimic any natural form of life; novel molecular mechanisms might make the project much more feasible." (Bedau, 2011: 29)

It is understandable why an animated media debate followed the 2008 announcement that "the J. Craig Venter Institute had created the world's first self-replicating bacterial cell with a completely synthetic genome" (Gutmann, 2011: 17). As Amy Gutmann, chairperson of the Presidential Commission for the Study of Bioethical Issues recalls, "proponents and critics made striking claims about the discovery – ranging from 'Frankencell' to the idea of humans 'creating life'." (Gutman, 2011: 17) Consequently, Barak Obama requested a report on this subject from the Presidential Commission for the Study of Bioethical Issues. The report *New Directions: The Ethics of Synthetic Biology and Emerging Technologies* was issued by the Commission in 2010.

There is no surprise that JCVI's accomplishment caused a wide range of reactions which often reflect opposite positions regarding fundamental beliefs and values. "Certain scientists want to drive a stake into the heart of vitalism, and perhaps to undermine religious positions concerning the origin of life, while 'civil society' groups stoke fears about Frankenstein and want a moratorium on research in synthetic biology." (Carlson, 2011, 23) It is interesting to realize that while the public discourse surrounding JCVI's accomplishment often tackled wider 'metaethical' problems, the commission's report concentrated mainly on identifying principles and policies.

Thomas Murray (Murray, 2011) noticed these two reactions to the JCVI's feat as well; according to him they are quite typical in the sense that they reflect two different approaches to ethical problems in general. They generate two different types of disputes on ethical issues which Murray calls *interests* and *identities* (the latter are closely related to what in a different terminology would be called 'worldviews'). In comparison with my earlier discussion of approaches to computer ethics *interests* would fit the *professional ethics* approach, whereas *identities* would be comparable with the philosophical, 'metaethical' approach. According to Murray, the main practical difference between these two approaches is that an *interests* dispute can be resolved through policy negotiations with all parties involved being reasonably satisfied with the outcome, whereas an *identity* dispute creates a 'winner-loser' status quo "with the losers merely biding their time until circumstances allow the battle to be renewed." (Murray, 2011, 32) This is an important observation. For those who follow the ethical debates pertaining to problems in the 'cutting edge' sciences and technologies, it brings up the point that agreements over policy may win battles but don't guarantee winning a war. For the latter to happen, much more effort is required to solve the *identity/worldview* issues.

5. Robotic caregivers

The case of robotic caregivers presents a very good illustration of intersection and mutual entanglement of *interests* and *identities* issues; or, in other words, professional ethics and general ethics, (megaethics). This is especially due to the fact that robotic caregivers from the very beginning became a global phenomenon, and therefore their presence affects a variety of cultures, worldviews and, in Murray's terminology, identities. Following are some of the many issues in robot ethics pertaining to robotic caregivers.

Robots, of course, have a long and rich history (Robot, *Wikipedia*), both as ideas and as contrivances resulting from technological ingenuity; but a truly important qualitative change regarding their significance for the (global) civilization took place only recently. Therefore, it is quite safe to treat the emerging *robot ethics* as a venture into uncharted territory for which the closest point of reference and the closest affinity could be found in bioethics and in particular, in the ethics of synthetic biology.

Some of the typical issues addressed in the context of robotic caregivers, are the questions of responsibility, human autonomy and dignity, relationships, communication, and decision-making processes. Many of these topics by far exceed the concerns of the pioneers of robotic ethics such as Norbert Wiener and Isaac Asimov. Besides the general 'metaethical,' technological, medical and social aspects of using robots, especially anthropoidal robots, as caregivers there are also problems concerning purely medical or business issues which contain their own set of ethical questions often belonging strictly to the area of professional ethics. Within each of these problems, several sub-categories can be further identified.

Depending on the area and extent of care and also depending on the nature of human interactions certain ethical problems take precedence over others. For instance, in long-term care activities aiming at assisting caretakers with completing everyday tasks such as eating, grooming, dressing, etc., and companionship play an instrumental role. In order to properly fulfill their intended functions in this area, caregiving robots should have not only the 'physical skills' but also the ability to communicate effectively with a variety of individuals besides the caretakers (such as the robots' creators and/or technical supervisors, the medical or other professionals, individuals emotionally related to the patient/caretaker by family ties or friendship). A significant number of these individuals, in particular patients/caretakers and their families and friends, could be technologically illiterate, which could cause a separate set of problems, especially in crisis situations. These are just some of the 'simple' problems regarding this topic. Far more complex, as mentioned earlier, would be questions related to human autonomy and dignity as well the issue of independent decision making by robotic caregivers. These problems are closely related to the problem of robot-human communication but have a much wider philosophical dimension.

5.1 Communication

The communication problem requires further diversification depending on the level of communication a caretaker is capable of; for instance, verbal (oral/aural, sign language/physical, written language), non-verbal (e.g., muscle spasms, bodily functions measured by instruments). Some of the existing robots have a high level of sophistication regarding non-verbal communication. "Cyberdene has developed the Hybrid Assistive Limb suit (HAL) which is currently available to rent in Japan. It detects nerve signals sent by a person attempting to move, and then is said to automatically move the muscle as the person expects. It can apparently multiply original strength by a factor of 2–10." (Sharkey & Sharkey, 2010)

Communication with patients suffering from cognitive disorders creates its own set of problems and belongs basically to a separate category. This is mainly due to the elevated responsibility of caregivers in light of the philosophical, ethical, legal and procedural issues involved (see, for instance, Crigger, 1993: 198-206), but also because of the growing urgency to treat this kind of disorders (PTSD being presently most visible among them), which is amplified by the shortage of trained professional (human) caregivers.

The most common problems in the context of robot ethics and robotic caregivers would be the problem of proper interpretation of messages conveyed by a caretaker to the robot and the problem of acting upon the wishes/directives issued by a caretaker. In all these cases the level of autonomy of both the caretaker and the robot in decision-making processes plays also a very important role.

There is another communication-related problem with significant ethical weight. Some caretakers, for instance those with memory problems and/or diminished cognitive skills could mistake anthropoidal robotic caregivers for humans; either for their relatives/friends or for individuals perceived to be malevolent. Obviously, the ethical problem of deception emerges here as well as the issue of communication.

One more issue should be addressed here. It is the fact that "The robotic technology could be developed more as a tool, rather than as an identifiable robot. It could even begin to function as an extension of the elderly person's body and mind." (Sharkey & Sharkey, 2010) With a robot embedded into a human body and/or mind the problems of communication (especially the issue of identifying the communicator) as well as human identity and autonomy acquire a new dimension; also in terms of ethical problems.

5.2 Human autonomy and dignity

The fact that the area of caregiving seems to have been targeted as the field of experiments in anthropoidal robot-human relations could also cause serious ethical concerns. One of them is the potential of 'second-hand' abuse of the caretakers by 'humans behind the robot.' "Who controls the robots? Are they actually designed to help the elderly person, or to cut costs and reduce the workload of their carers? Often the focus is more on improving the lives of the caregivers, rather than ensuring that robotic assistance is provided in such a way as to improve the lives of the elderly themselves." (Sharkey & Sharkey, 2010) Of course, an argument could be raised successfully on behalf of robotic care in light of the not so rare abuse of caretakers by their human caregivers, which has been an issue causing ethical concerns for a long time. The same could be added with regard to the problem of communication; if the robotic caregiver-caretaker communication causes concerns it doesn't mean that there are no human-human communication problems between caregivers and caretakers but also – quite notoriously between physicians and patients (Groopman, 2007).

These problems reach out into another very important dimension, namely that of the human dignity. Francis Fukuyama, following Immanuel Kant, called human dignity – which is in his view inseparably linked to his famous Factor X – the "essential human quality." (Fukuyama, 2002: 149f)

I would like to mention at this point that one of the most important characteristics of Kant's ethics was his insistence on the treatment of human individuals as *autonomous* beings. Dignity and autonomy belong to the most fundamental moral properties of a human being. Philosopher Simon Blackburn describes the mechanism of the denial to treat someone as an autonomous human being when he writes: "Suppose, for instance, that I have behaved in a way that I want to explain. But I find other people listening to my story with a look in their eyes that suggests that this talk is just another symptom. It is just another sign that I need to be managed or handled or cured or trained. Then I have been dehumanized. (…) I want other people to 'hear my voice,' which means appreciating my point of view (…) rather than wondering what causes a human organism to behave like this." (Blackburn, 1999: 108) Many a patient can recall being in a situation like this. Blackburn, of course, addresses the question of dehumanizing-through-not-listening in a general philosophical way. Sharkey & Sharkey echo this observation and translate the concerns regarding this issue into the area of robotic caregivers. "There are two main ethical concerns about the use of assistive robot care for the elderly and its effects on their welfare—first that it might reduce the amount of human contact that the elderly have, and second that if used insensitively, it could increase senior citizens' feeling of objectification and a lack of control over their lives." (Sharkey & Sharkey, 2010) In Western philosophy, particularly in phenomenology, existentialism, personalism, and in various branches of philosophical anthropology and social philosophy this problem has been addressed quite thoroughly; mainly in the context of what is known as 'the human condition.'

Unfortunately, medical patients, especially the elderly and patients with cognitive/mental disorders, are not infrequently deprived not only of autonomy but also of dignity and that this deprivation takes different forms and has a variety of causes and/or reasons. In robotic health-care, this lack of autonomy of a patient could potentially elevate the ethical problem of human dignity to new heights, especially in cross-cultural relations and in patient-robot interactions. Therefore, "It is important to ensure that robots introduced into elder care do actually benefit the elderly themselves, and are not just designed to reduce the care burden on the rest of society." (Sharkey & Sharkey, 2010)

Given the paradigmatic significance of introducing anthropoidal robots to the day-to-day life of 'ordinary people' and given the likelihood that the autonomy of these robots will expand with further development of science and technology, it seems to me that it is very important to raise the global awareness of the issue of robotic caregivers now. It is also very important to have a thorough global discussion regarding robot ethics conducted from both positions, that of *interests* as well as *identities.*

6. Conclusion – a glimpse at future problems

I believe that robotic caregivers will be one of the fastest growing areas of development in robotics in the immediate future both technologically and commercially. The latter will be caused chiefly by demographics (rapidly growing population of the elderly); persisting shortage of nurses, especially those well qualified and willing to work with only marginally responsive patients (Roy & Pineau, 2007); and worldwide cultural changes (progressing 'atomization' of family units, growing mobility of the younger generation, etc.). According to some estimates, the sales of personal robots for eldercare by Gecko Systems International Corporation alone "will reach 8.3 billion dollars by 2014" and their prices will decline quite rapidly from the $80,000 or so in 2010. (Sharkey & Sharkey, 2010) Moreover, robots, including robotic caregivers are already 'imbedded' in the fast growing area of telemedicine (Jordan-Marsh, 2011, esp. p. 7 & 399). It is safe to assume that their presence in telemedicine will grow in visibility proportionally to the advance of telemedicine itself.

I also believe that with their increasing ubiquity robotic caregivers should cause growing concerns among ethicists as well as among the 'general public' worldwide. One can hear voices that the worries about the brave new world of autonomous robots escaping human control and developing 'minds of their own' are premature. We are just at the beginning of this development – the argument goes – and the science and technology involved are so incredibly complex that it will take a very long time before humans will have to face such a situation. That may be the case if one accepts the view that humans are supposed to *react* to a new reality. However, if humans are supposed to be *proactive* and to prepare themselves for this new reality and for the problems it will generate then precious little time is left to do so. Writing about synthetic biology, Mark Bedau stated, "Many – including me – are convinced that fully synthetic cells might very well be created within our lifetimes, perhaps even within the next decade." (Bedau, 2011, 29) Of course, one can say that there is still a great distance between a synthetic cell and an autonomous complex synthetic organism; just as it is a great distance between a robotic nurse capable of handing out a glass of water to an elderly person and a robotic caregiver capable of satisfying all of the needs of a disabled person, and having total control over such a person.

But what does a great distance or long time mean? Thousands, hundreds of years? Decades? Are decades out of the question? I don't think so. There is a great distance between publishing the theory of evolution and creating a synthetic genome. But it only took 150 years to close this distance and it happened at an accelerated speed. Let me recapitulate some of the milestones along that road. 1859 – Charles Darwin published *On the Origin of Species*. 1866 – Georg Mendel finished some of his experiments with peas in which he made, among others, an observation which helped Friedrich Mieschner isolate (in 1868) what today is called nucleic acid. 85 years after that, in 1953, Francis Crick and James Watson published a paper about the structure of the DNA. Fifty years later, in 2003, the mapping of the human genome was completed. In 2008, the progress made in creating a synthetic bacterial genome reached a point at which it was perceived a cause for various ethical concerns urgent enough to merit, at least in the United States, the interest of The Presidential Commission for the Study of Bioethical Issues.

For comparison, here is a brief timeline of robotics. Putting the pre-computer attempts at creating robots aside, one could start with 1921, a year in which Karel Čapek introduced the word *robot*, followed in 1941 by Isaac Asimov's *robotics*. Norbert Wiener introduced the principles of cybernetics in 1948, and in 1949 the robots *Elmo and Elsie (The Turtles)* were created by William Grey Walter. The term *artificial intelligence* was coined in 1956. In 1961, *Unimate*, the first industrial robot was 'employed' on the assembly line by General Motors. In 1970, *Shakey*, the first robot able to reason about its surrounding was built and the Soviet *Lunockhod 1*, a remote-controlled robot, explored the surface of the moon. The 'robotic explosion' followed. In 1996, Honda introduced its anthropoidal robot *P2*. In 2004, a self-replicating robot was revealed at Cornell University. In 2010, 89 years after Čapek introduced the word 'robot,' NASA sent an anthropoidal robot *Robonaut 2* into space on the Space Shuttle Discovery. I would venture a claim that the reality of autonomous anthropoidal robots will soon cause similar ethical concerns as did the creation of a synthetic genome.

An interesting by-product of this expansion of the scope of ethical concerns and problems is that it at the same time strengthens as well as weakens ethical anthropocentrism. Strengthens, because these two areas of 'non-human ethics,' animal ethics and robot ethics, are the products of humans and are presently explored from the human perspective and, in a sense, the two new branches of ethics 'radiate' from humans. At the same time, anthropocentrism is weakened in the process because the present ethical expansion foreshadows a very radical turn of events, namely the creation of ethics not only for but also by *robots* (presumably anthropoidal robots; however, one cannot exclude the future existence of *autonomous non-anthropoidal* robots). Should this happen, human-centered and human-generated ethics will lose the status of exclusivity.

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SOCIAL AND COMMUNICATION CHALLENGES FOR AGILE SOFTWARE TEAMS

Peggy Gregory and Katie Taylor

Abstract
Agile methods are being widely used in industry and government projects as a way of delivering IT software projects. We report results from a survey about agile team work and a follow-up interview study. Themes emerging from the interviews were team tension, method adaptation and cultural change. We discuss the implications of practitioners' experiences and views, and highlight some of the social and ethical challenges for IT developers working in organisations that adopt agile methods. We take as the focus of our work, a view that cultural shifts are essential to agile working, and that these require an intensive commitment from individuals, teams and organisations.

Keywords
Agile Methods; Social and Ethical challenges; Team working.

1. Introduction

Evidence suggests that agile methods are being widely adopted and used in industry and government projects (West and Grant 2010). In the UK the most popular agile methods in use are Scrum, XP and DSDM. The underlying principles of agile development are expressed in the agile manifesto, and are briefly summarised in the following statement:

"We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

Individuals and interactions over processes and tools;

Working software over comprehensive documentation;

Customer collaboration over contract negotiation;

Responding to change over following a plan.[1]"

These principles form the basis for all agile methods, expressing a focus on people-centred, pragmatic, collaborative and flexible software development. The agile approach is characterised by incremental and iterative development of software with frequent delivery of finished products that provide business value. Underlying this approach are core practices, such as working in co-located, self-organising teams, having small regular meetings, working flexibly to accommodate change, actively involving customers in the development process, and using retrospectives and feedback to improve practice.

As a result of the growth in uptake of agile methods, we are interested in understanding how they are practiced by teams of developers on the ground. One of the criticisms levelled at the agile community has been that its claims for success are largely unsubstantiated (Dyba and Dingsoyr 2008). Despite this, in the UK, agile project management is becoming very popular and in March 2011 the Institute for Government made recommendations for improving government IT by adopting agile approaches, and is tracking progress on the changes set out in the Government ICT strategy[2]. As one of the key components in the agile approach is team work and frequent interpersonal communication (Sharp and Robinson 2010), we have focussed our research on investigating agile teams. We are particularly interested in team communication (Markham 2009), and how the use of agile techniques impacts on the working experiences of software developers and other professionals who work in agile teams

[1] http://agilemanifesto.org/

[2] http://www.instituteforgovernment.org.uk/our-work/more-effective-whitehall/fixing-flaws-government-it

(Whitworth and Biddle 2007). We discuss results from two exploratory empirical studies with the aim of teasing out some of the social and ethical issues that arise.

We undertook a survey during summer 2012 to explore team structures and communication approaches used by agile teams. This was followed by two semi-structured interviews, the aim of which was to gain a more detailed understanding of how individuals experienced team work and which aspects they found most challenging.

2. Agile Team Work Survey

The questionnaire consisted of ten questions asking which agile method teams used; typical team size; team member location; how the team communicated; meeting frequency; meeting attendance; meeting type; meeting recording; experience with agile, and finally an assessment of how agile the team were. The aim of the survey was to assess what variety there was in the way that agile teams were constructed.

The questionnaire was targeted specifically at practitioners who were already working in an agile team. It was distributed to agile practitioners in the UK both in paper and online formats. The paper copy was distributed at two conferences in which a majority of the attendees were agile practitioners. Additionally, it was distributed electronically to agile business groups using distribution lists and LinkedIn groups such as BCS Agile Methods, AgileNorth, Agile DSDM, Agile Yorkshire and Agile Scotland.

Thirty-seven completed questionnaires were received. The most commonly used agile method was Scrum (38%), followed by mixed methods (for example 'a hybrid of XP and Kanban', 30%), Kanban (16%) and DSDM (11%). Team sizes varied between 4 and 30, with a mean size was 6. However, 70% of respondents stated their teams consisted of between 4 and 8 members. Most respondents reported that they were co-located in a dedicated work area (73%), with only 11% reporting that they worked in globally distributed teams. 81% said they regularly had face-to-face meetings and 19% used electronic communication. Also most respondents (78%) reported that they had daily team meetings, with 13.5% have weekly or bi-weekly meetings and 8% meeting less frequently. When asked to describe how decisions were recorded, electronic shared documents were the most frequently used tool (65%) followed by wall charts (46%), other means (19%), paper-based documents (8%) and unshared electronic documents (2%). In terms of meeting attendance 49% stated that all team members attended meetings, and 46% said most team members attended meetings and 2% said that meeting attendance was poor. 18 respondents answered questions about how long the team had used agile methods and how agile their team was (as these were added later to the online survey). Of the respondents who answered this question the range of experience with agile methods was 1 to 10 years, with a mean of 3.2 years. This group of respondents also answered a question about how agile they thought their team was on a scale of 1 to 5, where 1 is hardly agile at all, and 5 is totally agile. Of these 2.7% rated their team as 2, 15.2% as 3, 21.6% as 4 and 8.1% as 5; the mode was 4.

These survey results indicate that our survey respondents use a variety of agile methods, including mixed methods. The relatively high number of respondents using mixed methods indicates that some teams find they need to adapt agile methods to make them workable within their organisation. Scrum was the most popular single method used, and was also frequently mentioned as a hybrid method. This is unsurprising as Scrum is a framework approach for software development teams and it is structured by a small number of simple team practices such as the sprint planning meeting, the daily scrum, the sprint review and the sprint retrospective (Schwaber 2004). It does not contain as many software development-specific practices as XP and hence is a more generically usable method.

Our results suggest that many of our respondents have been successful in implementing the core agile team-management techniques of working in small co-located teams, meeting daily and managing shared documentation in the workplace. The fact that most respondents stated they worked in co-located teams was particularly interesting as this can be a difficult requirement to fulfil. However, despite this, less than half of respondents said their teams had full team attendance at meetings. Quite a few teams used paper-based documents such as wall-charts, as well as electronic documents. In general there was a surprising homogeneity amongst responses, and many appeared to be achieving

core agile team work practices. However, some comments that respondents added to the bottom of their questionnaires indicated that there are other issues to be teased out about agile team work. One respondent commented that:

"cultural differences need to be taken into account as we work with a diverse group of people, this means that whilst some will communicate problems or issues freely other may not."

Another view was:

"I work with many teams, a couple really 'get' agile, but most are 'cargo cult'; doing the practices but not understanding how to get the benefits from them".

These responses suggest that there are different ways of being 'agile' and that there are issues of cultural change that teams need to get to grips with when they adopt agile methods.

3. Interview Study

Following the survey, two follow-up interviews were conducted in which interviewees were asked to elaborate on their experiences of working within an agile team. Themes that emerged from these interviews were about team tensions and dealing with disagreements; team roles and adapting methods; and team culture. These suggest that much of the focus for both success and failure within agile teams comes from the intense communication practices that are a vital part of this way of working.

3.1 Team tension

Team tension and disagreements between team members were mentioned by both interviewees. The first interviewee was quite knowledgeable about agile methods, but was working in a team that had a history of problems with Scrum, and they were still experimenting with finding a way to make the method work for them. They were also working in a distributed team so three team members were based outside the UK, in Europe, the Middle East and the US and they had to use Skype for their team meetings. The first interviewee discusses team disagreements:

"Researcher: Did you have any disagreements between members of the team, and how did you resolve them?

Interviewee 1: Yes, there was lots of disagreement. I guess my knowledge of agile was emotional … it was hard to get that emotion across, it was difficult. And also, just some of the practical things, like having a discussion or an argument, it was quite difficult at the time.

Researcher: Do you think it might have been useful to have some sort of argument and resolved it?

Interviewee 1: You know, just being there. You're talking to somebody, and they're thinking…you know, all their facial expressions you know.. and you just can't get that across [on Skype]."

The second interviewee also talked about his experience of working in an agile team where there was a lot of unresolved tension and stress.

"The last place I was at, the biggest thing that I noticed was there was an undercurrent of tension and stress …um … that as an organisation they weren't fostering the practices you know like … Forming, Storming, Norming and Performing … they weren't going through those, they were still stuck in Forming. And the slightest bit of tension in order to kind of solve problems was quelled, so they never got past that stage."

3.2 Team roles and adapting methods

Both interviewees mentioned that their teams adapted methods, and that there were problems resulting from missing team roles especially with getting sufficient input from business customers. Both interviewees worked in Scrum teams, in which the customer role is represented by the 'product owner'. Interviewee 1 talked about the problem of not having a proper 'product owner':

"Researcher: What about users or customers? Were there any users or customers in the team?

Interviewee 1: No, no direct involvement. So the face of the customers would have been more the marketing arm… they bring back feedback from the customers and feed that back into the system

Researcher: Did someone act as the Product Owner in your team?

Interviewee 1: Yes. That role moved from person to person – this also caused issues. There were 3 different people who managed that role in my time at the company. The first person left the company, and then it rolled back to the head of the company, and then it was too much work for him to take on so he tried to distribute it back to somebody else. And the way they managed that were very different, and their visions for the product and their techniques were very different and that caused a lot of issues."

Interviewee 2 also talked about method adaptation, and the problems with not having a product owner who was fully integrated into the team:

"Researcher: Were there any Scrum techniques that you decided not to use?

Interviewee 2: No, they used most of Scrum. Where they had problems is tracking the monitoring the work. So Scrum basically has 3 statuses: not done, in progress and done, and this wasn't suitable for them because they had 6 different environments and the work would get pulled through, not only by them but also by other projects, so they had to track it through the 6 environments as well so I think they ended up with about 20 different categories.

Researcher: In terms of roles, did they use all the roles in the Scrum team?

Interviewee 2: They used all the roles, although from experience both the last [job] that I had and the previous two, the Product Owner role was very much an executive role, so they provided a strategic view and the business analyst provided the actual product owner role themselves so they wrote the stories rather than the product owner."

3.1 Cultural change

The importance of cultural change was highlighted in both interviews. Interviewee 1 talked about his recent experience as a new-comer in an agile team that had been together for a while. He discussed the problems of isolation in a distributed team, and the way that the team culture created uncertainty:

"a lot of the work was lone soldier – if that makes sense – so instead of working together with different people, you went off and did your own thing…. some of it was cultural as well – taking that on board and sort of dismissing some of the techniques and things like that. So they had tried some of the techniques before I started with them, they tried Scrum by the book but it didn't work for them so they went off and just sort of rolled back to what they were used to."

In contrast, Interviewee 2 gave an example of successful agile teamwork in a newly formed agile team:

"We had this whole interesting experience of having to build this practice, and overcome all the previous culture in the organisation also looking at developers that don't want to do agile, product owners that were new to it and didn't understand how to write stories but knew the benefits and wanted to make that successful, traditional project managers which were moving from command and control to servant-leadership, so there were huge changes around everything and in a matter of I would say, 4 sprints, that's 12 working weeks, we managed to turn about 90-95% of the people towards agile, changing the style from command and control to servant-leadership we got all the ceremonies working well and the retrospectives, the daily stand-ups, sprint planning sessions, all the reporting set up and done, which we did from scratch all the burn-downs, the product backlogs."

4. Discussion

We take as the focus of our work a view that the cultural shifts that are essential to agile working require an intensive commitment from individuals involved in the team, but these shifts have

repercussions beyond individuals and teams, into the organisation. This leads us to question how practitioners experience agile working, the extent to which they view it as a positive improvement, and whether there are any ethical questions we need to ask about the acceptability of this way of working.

One of the main consequences of working in an agile way is the increased amount of face-to-face working that teams engage in. The rationale for getting teams to co-locate is to help them to spot and solve problems more quickly as they can talk with colleagues sitting in the same room rather than only discovering problems during formal reviews. However, this way of working can be quite intense. Both interviewees in our study gave examples of experiencing unresolved inter-personal tension in agile teams. Obviously tensions can occur in any working environments but as agile teams experience a more intense form of working relationship, these tensions are harder to avoid. There are potential problems with asking IT developers to work in high-intensity teams, as many are introverted and are more comfortable working on their own (Capretz 2003). Another activity characteristic of agile work is the commitment to delivering outputs in short time-boxes, which can also put a lot of pressure on staff. These can be seen as a form of micro-management through which staff are tracked and controlled. The use of wall charts and kanban boards to promote a visual workplace, also explicitly exposes the work patterns of individual staff to public scrutiny. We question whether, in the wrong hands, some of these practices can be used to coerce and control staff.

Working collaboratively with customers is the third principle in the agile manifesto, and is a core practice embedded into agile methods. Interesting parallels can be drawn between this and the tradition of participatory design (Iversen, Halskov et al. 2010). Agile techniques, such as the use of facilitated workshops in DSDM, are designed to provide ways of ensuring that stakeholders can have meaningful input throughout the development cycle. However, both our interviewees talked about problems with getting customers into the team, and anecdotally we have heard other agile practitioners discuss this problem. This is often explained as a practical problem of not having easy access to someone with the right business or user knowledge because they are too busy, located elsewhere, or hard to identify. But there are other aspects to this problem. Customer collaboration is costly as customer representatives need to work regularly with the development team because of the iterative nature of agile projects. Some customers struggle to see the benefits of collaborative working, so they don't buy-in to it. Also, we have seen cases where managers act as proxy for 'customers' as a way of maintaining control over projects, so while they devolve control of low level tasks to the agile team, they retain overall strategic control (Thompson and McHugh 2009).

We have found that cultural issues are important in agile development, at different levels, organisationally, within the agile team and individually. Both interviewees mentioned the importance of having the right culture within the team. The second interviewee was a Scrum Master and therefore was able to influence and develop the culture within his team. However, the first interviewee was a programmer whose suggestions were not listened to by the team, and he felt the team wasn't working very well because they had not developed a good agile 'culture'. Agile teams can have problems because they feel like they are working against the culture of the organisation, and this can leave them struggling to achieve their aims. In contrast, there can also be a sense of positive energy in agile teams, as ownership of working processes can be empowering and creative. There are a number of very enthusiastic advocates of agile development. It may be that software developers associate more strongly with their professional identity than their organisational identity. This is perhaps why there are many agile evangelists in the software engineering profession, and many examples of organisations in which agile approaches are being adopted from the bottom up (Marks and Scholarios 2007).

5. Conclusions

Our study found that the agile teams surveyed were largely successful in implementing the core agile team-management techniques of working in small co-located teams, meeting daily, and using shared visual documentation. A variety of agile methods are being used including mixed and adapted methods. Themes emerging from the interviews were team tension, method adaptation and cultural

change. When we explored these in more depth we found they contained some interesting contrasts around control and organisation. We believe these are worthy of further scrutiny.

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HELLO "SMARTER" WEB MARKETING, GOODBYE SOCIAL DISCRIMINATION. REALLY?

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Abstract
Weblining refers to the exclusion of classes of consumers from the marketplace based on characteristics of groups not individuals. People are prejudged according to assigned social affiliations. This is done in two ways. First, smarter marketing utilizes fine-grained data and is much more capable of picking up biographical nuances. Crude gender and race stereotyping is made obsolete. Second, smarter marketing taps into the stream of social networks, and information gleaned from social group dynamics replaces or supplements biographical data. In this paper, we will evaluate smart marketing's second claim-- that social discrimination disappears when social data is used-- by focusing on Facebook and its business strategies.

Key Words
Web marketing, social discrimination, Weblining

1. Introduction

International Business Machine's commercial, "*Smarter marketing: Seeing customers as individuals,"* which aired in August 2012 depicts a group of female joggers conspicuous in their matching outfits running past a set of men wearing identical suits. The narrator explains that "Companies used to view us as demographics because they couldn't see what made people different." The suited men in the commercial expose this marketing shortcoming by removing their suit jackets to reveal a diversity of clothing styles, hence individualities. The narrator states, "Today retailers from the US to Japan are using analytics to find insight in social chatter, reviews, and sales transactions, helping some companies increase online revenue up to 50% by offering customers an experience as unique as they are. That's what I'm working on; I'm an IBMer. Let's build a smarter planet." This IBM commercial dramatizes two claims made by the web marketing/advertising industry. That they 1) serve the consumer's best interests and 2) utilize sophisticated analytics that obviate social discrimination. The first claim critics hotly contest pointing out privacy violations, consumer manipulation, and lack of autonomy, for example, in not knowing and not controlling the data collected from cookies and clicks. The second claim, however, has faced less scrutiny. The critique that we present in this paper is informed by our study of social networking sites, most importantly, Facebook. We propose that innovative strategies to record and mine users' social connectivity for marketing purposes present a new and troubling pathway for social discrimination.

2. The Common Critique

Before discussing social discrimination, let us go over the common critique of the e-marketing industry. Personal data has become a valuable commodity to buy and sell. According to Forrester Research, U.S. companies spend up to $2 billion a year to collect information. Using customer relationship management software to grade customers is becoming more common (Holbrook and Kulick, 2001). Unfortunately, firms are capturing more than customer related behavior and this is of greater concern to privacy advocates. They now have credit histories, shopping habits and personal habits such as web browsing, health, lifestyle, sexual orientation, politics and other personal preferences that go beyond what we buy. A McKinsey report from October, 2011 describes companies seizing the potential of big data as industries ranging from "pharmaceuticals to retailing to

telecommunications to insurance" are using large scale data-gathering and analytics to shape strategy to differentiate themselves (McKinsey, 2011). Analytic software gives marketing firms the ability to sort data collected from customers into patterns to segment a customer base. Web generated data can be collected from registration forms, online transactions, and other clickstream records. Clickstream data gives marketers the ability to analyze paths, shopping carts, search by key terms and entry and exit points. Decision tree models are used to sort customers into groups to make predictions about behavior. Other tools such as market basket analysis let retailers know what a customer is buying at the same time and puts that into clusters to personalize communication to the consumer (Danna and Gandy, 2002). When a customer is looking for a product online, the store can see the consumer's entry point, keywords used in the search, the clickstream within the site, and the contents of the shopping cart. The store can then compare this data to existing customers and put the consumer into a group profile. This profile may or may not be accurate. This is the crux of the ethical issue with behavioral advertising – there are consequences that flow from assigning a consumer to a profile group that may have deleterious effects on his/her purchasing power.

For example, a targeted advertising approach based on what a consumer has actually purchased is done by the "global leader in customer engagement", the Affinion group. They have over 5300 clients including 18 of the top 20 financial institutions in the U.S. that purchase credit card information. This enables personalized advertising. Their website states, "whatever business you're in – banking, e-commerce, retail, direct-to-consumer – we're in the business of increasing your revenue." They do this by "realizing incremental fee income and monetizing traffic from current customers through cross sell or up-sell marketing." Their product NetGain! uses a customer segmentation approach that analyzes needs, attitudes, and behaviors of customers. A description of NetGain! on the website states " NetGain's strategy leverages real insight by taking into account a variety of demographic and psychographic data to determine at the household level who has the highest propensity to respond to specific products at the category level (e.g. deposits, lending)" (www.affinion.com/solutions). The Affinion direct response group (adrg) advertises services such as database modeling and analysis and describes their product as "precision tuned, data-driven methodologies to analyze and predict customer buying patterns and behaviors that deliver the necessary metrics to attract and retain customers. Our 30 modeling analysts, PHD statisticians and programmers focus on building highly predictive response models that support thousands of marketing campaigns annually" (www.affinion.com/solutions).

3. The Scored Society: The E-Score and a Question of Fairness

Retailers and service providers increasingly rely on e-scores to identify "targets" and "wastes" (desirable and undesirable consumers). On the Internet, Google ranks consumers' search results, Facebook scores each consumer based on our his/her habits, Klout scores are based on activity on Twitter and e-scores rank our value as customers (Singer, 2012). Shopping is no longer an egalitarian activity where consumers are charged the same price for the same item purchased. Loyalty card programs and other means of tracking consumer habits mean that two customers are charged different amounts based on their shopping patterns and history with the product even though they purchase it the same way at a the same time from the same location. This lack of transparency results in an unfair price advantage for some but not all buyers (Clifford, 2012).

The e-score is becoming an increasingly powerful way of determining the value of a customer and whether companies want him/her as a consumer of their product. Companies such as banks, credit card and debit card providers, insurers and online educational institutions are using this data to decide what (if any) product is pitched to a particular consumer (Singer, 2012). From an ethical standpoint we are concerned about the creation of a subprime class that companies or financial organizations can choose to ignore when they offer credit cards, insurance or loans. The consumer program director of the U.S. public Interest research Group stated, "There's a nontransparent, opaque scoring system that collects information about you to generate a score – and what your score is results in the offers you get on the Internet. In most cases, you don't know who is collecting the information, you don't know

what predictions they have made about you, or the potential for being denied choice or paying too much" (Singer, 2012).

The e-score in essence creates a two tiered system that gives preference to profitable users for important buying powers and protections and denies others. This is clearly in opposition to the intent of the Fair Credit Reporting Act which requires that consumer reporting agencies show users their credit reports and allow corrections to incorrect errors on the report. This law also mandates that consumers know if any adverse action is taken against them based on the reports. The proliferation of consumer ranking and digital marketing practices raises concerns about basic principles of justice and fairness in society.

4. Ordinary Forms of Social Discrimination: Redlining and Weblining

The term redlining was first used in the 1970's to describe the failure of banks, insurers and other service providers to offer services to residents of the inner city where a red line was literally drawn on a map to indicate locations where the company would not do business. Statistical discrimination, often based on census data resulted in such racially discriminatory practices as not offering home loans to African-Americans regardless of income level. Redlining is prohibited today, but a more far-reaching practice emerged in the digital age. With "weblining" the map used is not a geographical map, but a data map with points derived from how we navigate the internet, where we go, how much time we spend, what we consume, and our purchasing practices. Individual data is aggregated and certain predictions are made about the behavior of certain demographics.

Marcia Stepanek (2000) of Business week coined the term "weblining" when she described how banks ranked their customers and assigned different fees and services based on that rank. We now use this term in a broader sense than just price discrimination. Weblining refers to the exclusion of classes of consumers from the marketplace based on characteristics of groups not individuals. If you are deemed affiliated with an undesirable demographic, you might not get a loan, receive credit, or be insured based on a group level prediction. People are not treated as individuals to be examined case by case, but rather are prejudged according to assigned social affiliations.

The Internet which was touted as the great equalizer then has the potential to foster discriminatory practices. When the Internet is used to webline, it is creating inequalities and barriers to access. If insurance companies exclude segments of the marketplace and limit their sales efforts to the financially well off, for example, a disparate impact can negatively affect parts of the nation that have trouble getting insurance (Chin-Hui-Lai and Kleiner, 1999). In addition, this information can be sold to various organizations and go from firm to firm. It can easily lead to social prejudice or worse forms of outcasting and stereotyping. It may also construct a barrier to upward mobility.

There are no specific laws that protect us from the social aggregation practices that assign us to arbitrary groups based on our internet choices. The few cases of weblining brought before U.S. courts had strong affinities with redlining. The Association of Community Organizations for Reform Now (ACORN) claimed that Wells Fargo steered individuals away from certain housing districts based on racial classifications and stereotypes about racial "life-styles." In another suit it was alleged that Kozmo.com denied delivery service to residents in "predominantly black neighborhoods in Washington, D.C., based not on individual information but on geographical location" (http://ecommerce.hostip.info/pages/1078/Weblining-Internet-Redlining.html). Most weblining practices do not prioritize geographical location and use more sophisticated analytics than crude racial profiling; therefore, they are unlikely to be challenged according to the key anti-redlining policies of the Fair Housing Act of 1968 and the Community Reinvestment Act of 1977.

5. Smarter Marketing and Social Discrimination

Companies such as IBM respond to the common critique by arguing that, far from taking advantage of consumers, smarter marketing provides a better consumer experience through customization of promotions. Personalization is the key; moreover, it provides the additional benefit of eliminating

forms of social discrimination endemic to weblining. This is done in two ways. First, smarter marketing utilizes fine-grained data and is much more capable of picking up biographical nuances. Crude gender and race stereotyping is made obsolete. Second, smarter marketing taps into the stream of social networks ("social chatter" in the IBM commercial) and information gleaned from social group dynamics replaces or supplements biographical data.

Let us consider the first point. Granted, there is a quantitative change in the amount of personal information made available on platforms such as Google and Facebook, making possible fine-grained differentiations which are much less likely to raise alarms of racism, sexism, ageism, etc. This is not to say, however, that gender, for example, is no longer taken into account when identifying consumers of interest. Such an important "master status" most likely will remain one of the key variables in algorithms. Also, some biographical details such as country club membership and magazine subscriptions are so highly correlated with race and income that they are, in effect, proxies. Finally, the market is structured such that media buyers bid on access to a pool of potential customers and these are packaged according to familiar aggregates.

6. Social Media and Discrimination

We will evaluate smart marketing's second claim-- that social discrimination disappears when social data is used-- by focusing on Facebook and its business strategies. Facebook is the first social media public offering where content is entirely created by users (Bilton, 2012). From the user's perspective Facebook is a means to project oneself online and communicate and share with family, friends, and acquaintances, but from the business perspective of Facebook this is rich, authentic material to profit from by selling access. Users have helped to create a juggernaut by their willingness to share personal data as currency to generate future products and services from Facebook. A new twist on the relationship of user and social media sites is the payment by social media to shoppers who offer product links to something they like. Posting product links that drive traffic and sales to retailers is now worth $ 50 a month according to a New York Times (NYT) article from October, 2012. Is citizen marketing a paid promotion, an endorsement or a recommendation? The social media sites act as middle men by getting payment from retailers and paying for links directly into users' accounts. Some pay only if a purchase results, but others pay for each click they send. Should this payment be disclosed to friends? How will users perceive the money making side of this new relationship? Will they mind that their friend is making money when sending a link? These questions have not been studied due to the novelty of the practice (Clifford, 2012).

Currently there are over 1 billion users of Facebook. The sheer scale of this population, from which to gather information, is unprecedented. With the launch of a new feature called Timeline in September 2011, users can post information about their past as well as current interests and activities which enable the site to get even more valuable data which it can sell to advertisers. "Timeline is your entire life in one place, and it is unsettling to see the past presented as clearly as the present. Linking Facebook more closely to memories could make it harder for people to abandon the service for rivals" (Wortham, 2011). Currently there are as many as 82 data categories from which Facebook draws information. That number will surely increase as Facebook continues to add commerce, video and mail to their services eventually to become the one platform for everything we do on the Web (Sengupta and Sisaro, 2011).

The incredible scale notwithstanding, according to Facebook executives the "social graph" is the most innovative feature of their enterprise. It is made possible by users adding "friends" and engaging in diverse forms of online interaction with their friends. The connections and networks can be mapped (hence the term, graph), analyzed, and most importantly, plumbed for social data. The ubiquitous "Like" button prompts users to click to show interest in or approval of a product, service, app, game, etc. Ads called Sponsored Stories then go out to friends. Facebook processes 2.7 billion " likes", 300 million photo uploads, 2.5 billion status uploads and other data daily in order to determine which ads to send out to you. In essence it has become the world's largest data crunching machine (Vance, 2012). Anne Kandra (2012:24) relates an incident of a man writing a humorous response "about an ad for a 55-gallon drum of "personal lubricant." Next thing he knew, he was in ads hawking the lube to

his friends." Marketers are interested in seeing if Likes will be clicked along the paths of the social graph (which probably didn't happen in this case). If so, they identify a social network or networks of interest to make more concerted promotions.

With a Tom Sawyer twist, Facebook encourages its partners (e.g., corporations with fan pages, marketers, and advertisers) to have the social graph work for them. Carolyn Everson, Facebook's Vice President for global sales, described it this way in an interview conducted by Irina Slutsky:

It's way beyond just a social-media-advertising discussion. What we're trying to do at a simple level is be advocates on behalf of brands. If I like a brand story and I have a great experience that I post on my wall, it goes out to my friends and friends of friends-it's word-of-mouth marketing at a scale that we've never had before…

I feel very confident based on results that we're seeing, especially when friends are recommending to friends. Research shows that, on average, people are 68% more likely to remember seeing the ad if their friend has recommended it and twice as likely to remember the message of the ad (2011).

At first glance, this process seems far removed from standard weblining because the product promotion appears to be dictated by consumers' social networks and not by businesses. However, friend networks are significantly homogeneous with regard to race, ethnicity, and class. Media buyers may very well attend to the same sets of privileged consumers as in the past not because of biographical identification but because of social affiliation. In any case, the effect is the same in that promotions and discounts do not reach traditionally underserved populations. Even more troubling is the practice of denying services to an individual based on analysis of his or her social network. While friend networks might reveal to advertisers that people who like Caribbean vacations might also like tanning lotions and sunhats, they might also reveal information that could be used for more sinister purposes. For example, health insurance companies could purchase Facebook data on social graphs to identify associations between social status/affiliations and medical problems by analyzing posts, e-cards, and frequency of likes on social graphs for certain medical products. Individuals or families that apply for insurance that are found to share common characteristics with suspect social status/affiliations may be denied coverage.

7. Policy Vacuum

We described how innovative strategies to record and mine users' social connectivity for marketing purposes present a new pathway for social discrimination. In this last section we explain that we find this particularly troubling because we see no effective policies to counteract this. Anti-discriminatory laws, the most powerful tool in a government's arsenal, are useless because they have been written to combat clear, blunt racial identification and mistreatment. Arguably the most important novelty of E-marketing strategies is that the commercial interests in social discrimination are realized while the means appear to be above reproach. If legal action of this type is untenable, what else can be done?

7.1. Muddying Internet Tracks

There are some ways to make it difficult for internet tracking that can reduce email examination and analysis. Free services like HushMail, RiseUp and Zoho promote no-snooping or a user can register his/her own domain or set up an email server. Turning on a browser's private mode deletes cookies and wipes the user's history clean. Connecting to a V.P.N. will shield an I.P. address. Free browser additions like Ghostery and Do Not Track Plus will prevent Web sites from relaying information to tracking companies (Murphy, 2012). Of course, the more diligent one is with covering tracks, the less of a record he or she accumulates for the e-score systems. As with credit history, no record is as problematic as having a bad record. Furthermore, it is counterproductive to be invisible on social network sites. Even if a user keeps a low profile, she has little control over the social chatter of her friends, and it is the latter that is increasingly important to media buyers.

7.2. Promote Privacy Protections

Critics often cite Facebook's checkered history regarding privacy of user's information. For example, Sengupta and Rusli assert that "It has repeatedly alienated users over privacy issues – such as the case of the 2007 Beacon controversy, a tool that automatically posted what its users did or what they bought on other sites (2012). It settled with the FTC in November over accusations that it misled its customers about privacy settings. The settlement subjects Facebook to regular privacy audits for the next 20 years. The order also requires the company to obtain users "affirmative express consent" before it can override their own privacy settings (Sengupta, 2011).

The Federal Trade Commission (FTC) has recently tightened rules for web sites that collect data on children. Regulations governing the Children's Online Privacy Protection Act (COPPA) have not kept pace with technology advances. Web companies (as of 2000) are required to notify parents and obtain consent from parents when information is collected from children under 13 (Wyatt, 2012). However, many children use false ages online, and the law did not anticipate add-on's on children's sites that do not require consent. This problem is magnified as Facebook targets younger users. Recent complaints to the FTC focused on sites encouraging children to play brand-related games and provide email addresses of friends without seeking parental approval. Children are invited to make videos promoting products and send them to friends on sites such as McDonald'sHappyMeal.com, Nick. Com, General Mills' ReesesPuffs.com, SubwayKids.com, TrixWorld.com and CartoonNetwork.com. Friends of children are targeted by suggesting that children play games and share them with friends. The new rules proposed by the FTC would extend to mobile devices and expand children's protections beyond names and addresses to include identifiers like tracking codes that can be used to gather data about children as they visit sites (Singer, 2012). In a recent NYT article headlining the business section, it was reported that an operator of fan sites agreed to pay a $1 million civil penalty to settle charges that the sites collected children's personal information which violated the online privacy rule. Over 100,000 children aged 12 or younger had personal information collected without parents' approval. In registering for the fan site the children were asked for birth dates, cellphones, street addresses, parent's name and other profile information (Singer, 2012).

Europe has taken a different tactic when it comes to respecting privacy concerns and has introduced a new law that would force Internet companies to obtain explicit consent for use of personal data, tell users why their data is being collected and retain it only for as long as is necessary. This law addresses difficult questions: who owns personal data, what happens to it, and what balance is maintained between leveraging data and guarding privacy. In Europe individuals are gaining more rights over companies. A controversial aspect of the law is the right to be forgotten, which means the user can demand that the data be deleted (Sengupta, 2012). The global standards group W3C failed to get consensus on the issue of "do not track" preferences due to the conflicting legal approaches in the U.S. and Europe. In 2011 the FTC exempted first party advertisers like Google and Facebook arguing that consumers approved of collection because they chose to use the service. The European law does not make distinctions between first and third party advertisers and favors strict prohibitions on tracking (Sengupta, 2012).

In a survey conducted at the Berkeley Center for Law and Technology the majority of Americans said they do not want information collected about which sites they visit and have a strong aversion to online tracking in general. However, over 90% had not heard of the FTC proposal not to track and only 14% said they would like a tool to prevent websites from tailoring advertisements based on visited sites (Sengupta, 2012). Microsoft conducted a survey of users in the U.S. and Europe and found that over 75% wanted to default to the do-not-track option in their new Explorer 10 browser. Yet advertisers say that this threatens the barter system where consumers get free email, maps social networks and other Internet benefits from allowing tracking of online activity. "If we do away with this relevant advertising, we are going to make the Internet less diverse, less economically successful, and frankly, less interesting" said industry group general counsel for the Interactive Advertising Bureau (Singer, 2012).

8. Conclusions

In summary, privacy protections have a checkered history especially in the United States. Fortune 500 companies have a vested interest in keeping it that way. Furthermore, we see in these regulatory efforts a penchant for protecting the privacy of personal information; however, little attention is being paid to how that information in an anonymous and aggregate form may be used in ways that are discriminatory or how a more subtle form of discrimination can be based on collective information of friends. This would require an appreciation that leaked private information is not the only risk for denial of goods, services, and opportunities; rather it is also made possible by the social graph.

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AUTOMATED DECEPTIONS, BENEVOLENT AND OTHERWISE

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Abstract

This paper begins by exploring two fundamental questions: What is deception? When is it permissible to be deceptive? Then we focus on deceptions by machines made to masquerade. We analyze three cases: Case 1- The developers' intent is unethical and the consequences are bad; Case 2-The developers' intent is ethical and the consequences are good; Case 3- Mixed. Case 3 encompasses combinations of ethical intent with bad consequences and unethical intent with good consequences. Next we investigate more complex questions of how deception that involves artificial agents (AA) differs from deception that only involves humans. Finally, we analyze the ethical implications in situations involving masquerading machines, and how deception that involves both humans and machines impacts software development in general.

Keywords

Deception, Artificial Agents, Masquerade

1. Introduction

In her book *Alone Together*, MIT anthropologist Sherry Turkle (2011:90) writes:

In The Republic, Plato says, "Everything that deceives may be said to enchant." The sentiment also works when put the other way around…That which enchants, deceives.

We are enchanted by Siri the personal assistant on the iPhone. Robot pets and babies delivered to nursing homes thrill the patients who treat them like "real" pets and babies. The deception is there: Siri and the babies are not human, and the pets are machines, not animals. Yet, even when we are consciously aware of these distinctions, the power of these deceptions causes us to interact with these devices (Grodzinsky et al., 2009) *as if* they were people or animals.

For our purposes in this paper, a machine masquerades when it leads another agent to believe or behave as if the machine were human. This is a type of deception that raises particular questions. As people who think about the societal implications of technology, what are we to make of these masquerading machines? Are these developments merely slight variations on previous cases such as life-like (and not so life-like) dolls, or is something happening here that is a significant departure? Are these new deceptions beneficial, benign, harmful, or a mix?

This paper begins by exploring fundamental questions such as: What is deception? When is it permissible to be deceptive? Then we focus on deceptions by machines that masquerade. We will analyze three cases: Case 1- The developers' intent is unethical and the consequences are bad; Case 2- The developers' intent is ethical and the consequences are good; Case 3- Mixed. Case 3 encompasses combinations of aspects of the other two cases: ethical intent, bad consequences, unethical intent, and good consequences.

Software developers have a huge responsibility in deciding if, when and how to use deception. Developers use deception to provide a user-friendly level of abstraction. We abbreviate Floridi's (2008) term "level of abstraction" as "LoA." Previously we designated the level of abstraction of users as LoA1 and the level of abstraction of developers as LoA2 (See Grodzinsky et al, 2011). In this paper, we introduce LoAU and LoAD as clearer notation for the users' and the developers' levels of abstraction, respectively. While the sets of observables clearly intersect, developers do not typically have access to the entire context in which the user is running the software. Even so, developers can deceive because they understand and control the interface in ways that non-developers typically do not fully understand. This creates a power imbalance between developers and users. Furthermore, we

argue that it also creates a power imbalance between machines and people. Thus, questions regarding how a developer uses this power are particularly significant. One question with ethical significance that a developer has to wrestle with is whether the use of deception in software artifacts can cause a user to make inappropriate choices - choices with ethical significance - because of wrongly believing that something is true.

2. What is Deception?

The kind of deception of interest to us in this paper implies successful, intentional deception by developers and a misapprehension by people other than the developers. In "Deception and the Nature of Truth" Michael P. Lynch writes "I deceive you only insofar as I actually succeed at misleading you or directing you away from truth. Moreover, this misleading must be *willful or non-accidental.* So, X deceives Y with regard to f only if X willfully causes Y to fail to believe what is true with regard to f" (2009: 190-191).

Thomas Carson agrees that deception requires some kind of intention to cause others to have false beliefs, but distinguishes it from misleading someone; misleading may be inadvertent. "A person S deceives another person S1 if, and only if, S intentionally causes S1 to believe x, where x is false and S does not believe that x is true" (2009: 178 – 179). Carson says that deception connotes success, i.e., a deception is something that is believed.

If we accept the premise that deception connotes success, and if we limit ourselves to examples in which the deception is intentionally built into software artifacts, is this kind of deception always a bad thing? We think not. "Sometimes other things matter more than truth. Thus, more of us would be willing to be deceived, or to deceive ourselves, if we thought that more good than bad would come of it overall, or that the matter was so trivial that the point was essentially moot" (Lynch, 2009: 198). Robert Solomon's view of deception includes not only the particular deception, but also the context of the deception, the aims, intentions and character of the prevaricator (Solomon, 2009: 26). If the software developer is not intending to do harm, but trying to make life easier for the end users of his/her product (at LoAU), it might be assumed that this is an instance of a benevolent deception. Yet, it still raises the question of how a developer plays out the virtue of honesty when developing sophisticated machines that perpetuate deception.

Another relevant, subtle point is the use of metaphor when designing computing artifacts. For example, if a software developer uses a term like "document" or "file folder," both the developer and most users could articulate if pressed that the "document" is a digital entity, not a paper document; and that the "file folder" is not a folder at all, but just a way of thinking about organized collections of bits. (Our thanks to Luciano Floridi for this example.) These kinds of metaphors are (in the main) benign and consensual. But there may be cases in which the people involved do not share the same assumptions about the metaphor; in these cases, the developers may be unintentionally hiding reality behind a metaphor that has become a façade because of users' lack of familiarity with the underlying technology. This case is interesting, and may be useful to explore in future work, but it is not the focus of this paper. Instead we focus on cases where a deception is deliberate, and not merely a misunderstanding of a metaphorical interface.

From the point of view of the end user (LoAU), Mark Wrathall offers insight into deception as a perceptual experience (2009: 69). He explains that "when we are deceived, it's because the thing really looks like what we take it as." So deceptions, in this sense, have to do with misperceptions. It is how we view the world and how the world is presented to us. This is supported by the way Floridi handles different levels of abstraction in his development of information ethics (Floridi 2013). We can be deceived in our perception because of details that we do not notice or are hidden from us. If machines are deliberately anthropomorphized and perceived by a culture as persons, or even just as pseudo-persons, then the habits of our hearts (Bellah et al., 1985) may change in a way that gives machines some of the status that has previously been associated exclusively with humans. That is a big step, one fraught with ethical significance.

2.1 The ethical significance of a successful deception

Assume that a machine masquerade—a deception implemented by a developer—occurs. Assume further that the consequences are at worst benign and at best (on balance) good. Is there something fundamental about deceiving people in this way that is inherently objectionable, despite otherwise good results?

We do not think that the deception of a masquerade necessarily poisons the ethical well to the extent that *all* masquerades are to be condemned as ethically unacceptable. In non-computer cases, we typically accept the possibility of benign deceptions (such as luring someone to a surprise birthday party) and even benevolent deceptions (coyly responding to questions about refugees hiding in the attic from an unjust government). We see no reason that machine masquerades are categorically excluded from these kinds of exceptions to the rule. However, we do think that non-objectionable machine deceptions *are* exceptions and that the rule against such deceptions holds unless a valid argument overrides the rule in a specific situation.

Deceptions induce disinformation and misperceptions (Wolf et al., 2011). The virtue of honesty and the value of truth are givens in most forms of ethical discourse, and deceptions involving machines are fundamentally dishonest. Michael Lynch writes that "… deception is still something we deeply wish to avoid, and believing what is true is something we care about achieving … And that in turn tells us that truth is a value: the state of affairs of believing what is true is something we take to be a good" (2009:199). Deontic ethics would deny to deception any possibility of being good at all. This may not be a concern in the two cases where an AA is either the deceiver or the deceived, since it is unclear whether deontology with its human-centered focus holds sway here. On the other hand, it certainly has a role when an AA is the vehicle by which a developer deceives a human user. This role is further complicated in situations like those we relayed in the beginning of this essay: People, even when told initially and regularly reminded that an AA is not human or animal can still slip into a mode of behavior in which they treat the AA as if it were.

We do not claim that these deontological concerns require that *all* developer deceptions through masquerading artifacts are necessarily evil; in many practical situations the deception may be so slight and the intent of the developers so benign that only the most doctrinaire philosopher would label the act as evil. While it may be the case that we cannot reconcile these concerns within the bounds of deontology because of the pragmatic requirement of deception needed to create some computer artifacts, we maintain that when developers defend a machine masquerade as ethically justifiable, they should make an explicit argument for that exception. We contend that, because of the importance of truth and honesty, that a machine masquerade is "guilty until proven innocent." Our default position is that deceptive AAs are unethical, though exceptions can exist.

Case 1- The developers' intent is unethical and the consequences are bad

In this case, the default position holds. If a masquerade is intentionally designed for unethical reasons (by whatever ethical analysis you prefer) and if the consequences of the masquerade are bad (by whatever ethical metrics you use), it seems straightforward that there is no strong argument that the masquerade is ethically positive. We will not discuss this case further.

Case 2-The developers' intent is ethical and the consequences are good.

This would be a likely candidate for an exception to our default position. If the only thing we can argue against a deception is the deception itself, and especially if the intent and the consequences are authentically strong positives, we are likely to agree that the deception is justifiable, allowed, encouraged, or even mandated.

Case 3-Mixed

Cases 1 and 2 are probably rare. A developer's intent is rarely either consistently evil or completely pure. Consequences are rarely completely bad or completely good. In almost all cases, a masquerade will come from mixed motivations and will have mixed results. In these cases (including most of the realistic cases we have considered), from a consequentialist perspective we have to do the hard work of applied ethics to decide if the good outweighs the bad. From a deontic perspective we would have to examine the act of deceiving. What are the intentions of the developer? Can the obligation to

create the most user-friendly machine override the universal prohibition of deception? Can she make the case that the deception is benevolent, in the best interest of the users, and that she is not using them merely for her own ends? We contend when this case is made the deception is justified from a deontological perspective. In what follows, we will look at several examples where we start with the fundamental assumption that the deception makers have to make a case that their masquerade is a benevolent deception.

3. Deception used in the development of artificial agents

For most AAs, developers are interested in having users actually use and trust the AAs to do their jobs (see Grodzinsky, F., Miller K., and Wolf, M. J. (2011) for a discussion on trust and AAs). That being the case, they ought to carefully consider the impact of incorporating deception into their design. The incorporation of a harmful deceptive element in an AA is usually contrary to the purposes of the developer with good intentions. In this section we explore concerns that arise when deceptions are implemented in AAs and then consider concerns that arise when AAs are deceived by other AAs and humans.

3.1 Human-Robot-Human Deception

One of the concerns regarding masquerading machines is that their inherent deception may be included not because it is functionally required, but only because it is possible. The developer may not have needed to be deceptive to provide a suitable AA. Yet, deceptions may be developed because people working at LoAD find it interesting and challenging to mimic human appearance and behavior.

When designing an interface for a robot, for example, the developer might be happy with the functionality of the robot, but may decide that it would be more entertaining to users if it had a human or animal face. For the early model of the robot, its non-humanness is always observable to users at LoAU. When the human-like interface is added in the later model, the developer is incorporating a deception into the robot. The developer (LoAD) is aware of the true nature of the machine, but it is hidden, or at least obscured, from users at LoAU. The result is that the robot is masquerading as a human.

Even people who are initially aware of a machine's non-humanness may be "enchanted" after repeated exposure. As a person becomes accustomed to the AA's behavior—it regularly answers questions truthfully and honestly, and it looks like us or something that is familiar to us—the person interacting with the AA may change her expectations of the AA. An initial skepticism about the machine may be replaced with assumptions formerly reserved for people. For example, a masquerading machine may be regarded as trustworthy at least in part because of a human-like appearance. But the human-like appearance is probably irrelevant to questions regarding trustworthiness, and changes in behavior that might be noticed if the machine were more obviously a machine may go unnoticed if a machine is masquerading. That is, humans may give an unwarranted "benefit of the doubt" to a masquerading machine. If a person reaches a state where questioning the veracity of the information given by the AA is no longer a natural part of her interaction with the AA, it is easy for unintended consequences to occur as the user continues to make decisions based on that information. Thus, a robot practicing deception, through consistent high-level performance and familiar interfaces, can, in the mind of the user move to a state in which its non-humanness is not an observable. This may be true even for a robot that regularly reminds the user that it is not a human. The reminders may not register.

These concerns are born out in Sherry Turkle's research on robot babies and pets given to the elderly. At the end of the interaction period, she was unable to remove these robots as the users had become so attached to them (Turkle, 2011). Can this be said of the young who are more exposed to technology and therefore less easily deceived or enchanted? In the case of Callie, a ten year old, who took care of a robot baby for three weeks, "loving the robot makes her feel more loved. She knows the robot is mechanical but has little concern for its (lack of) biology…she sees the robot as capable of complex and mixed emotions." "When My Real Baby says, 'I love you,'…"I think she really does' " (Turkle,

2011:77). Thus, regardless of whether a robot's non-humanness is formally an observable, we may ultimately be dealing with a case where a human user does not observe it and believes incorrectly (or behaves as if) the robot is human. Robots that masquerade as humans have the potential to impact the decision-making processes of people. "At ten, ministering to her robots, Callie reminds us of our vulnerability to them. More than harmless amusements, they are powerful because they invite our attachment. And such attachments change our way of being in the world" (Turkle, 2011:79). Therefore, the choice to deceive, and the acceptance by the user of the masquerade reveals the asymmetric power structure that needs to be accounted for in design and development of robots (see Miller et al., 2012). Sharkey and Sharkey (2011) have written eloquently about existing and planned use of robots with babies, and the elderly; power mismatches can be seen playing out in these applications of masquerading robots.

Some developers of masquerading machines could have admirable intentions; but other developers who intended this form of social engineering may have nefarious intentions. Sometime the deployment of a robot becomes more important to analyze than the development of the robot, because context will determine the moral significance of the robot's actions. Depending on the situation, the consequences of the deception may be good or bad. However, even the developer who had good intentions might establish a viable mechanism that can be replicated by others whose intentions are less commendable. We liken this situation to the early development of e-mail systems. The unexamined assumption among early developers of the Internet and its precursors was that everyone using the Internet could be trusted. Today we see the impact of such a decision: significant amounts of network traffic and computer processing are dedicated to the eradication of spam from our electronic in-boxes, and phishing scams disrupt many lives. Significant care is in order when the potential impact of a technology enters into the human realm. Analysis, leading to the development of non-trivial counter-measures, seems to be in order to prevent extensive harm from deceptions involving sophisticated AAs that can masquerade.

3.2 AA – AA Deceptions

Up to this point, we have discussed humans being deceived via sophisticated machines. However, another kind of deception, machines deceiving machines, is already an important issue in Cyberspace. The significance of this type of deception is confirmed by the importance of "captchas" on the Web. (http://www.captcha.net/) A captcha is an automated puzzle designed to distinguish webbots from humans. A captcha is used when one AA (controlling online resources) is designed to grant resources to authenticated humans, but to deny those same resources to AAs masquerading as humans. This "species filter" shows that at least some AAs "object" to masquerading AAs.

Webbot AAs used by humans to buy things on the Web also present opportunities for sophisticated machines to try to fool other sophisticated machines. In e-commerce, a masquerade is possible that would swindle an automated shopping bot: masquerading as a legitimate automated vendor, but instead taking money under false pretenses. Similarly, but more sinister still, is a webbot whose job it is to penetrate a system (perhaps disguised as a person interacting with the system) in order to damage the target system. Cyber-warfare is an arena in which the ethics of masquerading machines is an active area of concern.

We should point out here that although these kinds of deceptions can from one frame of reference be legitimately categorized as AA – AA deceptions, from another LoA this is also a case of humans deceiving other humans, where the deception is mediated via two AAs. In the next section we look at a less common, but also interesting, situation.

3.3 Humans Deceiving AAs

Currently, the case of a developer deceiving an AA does not typically arise. A developer does not on the one hand, program a machine to embed one view of reality, and on the other try to convince the machine of another version of reality. However, we can envision cases of this kind of deception. For example, a developer researching human deception might develop a program that simulates human

thought processes, and during experiments about deception, the developer (or a user who ordered the simulation) might input true statements and false statements, probing for what kinds of deceptions are successful. In such experiments, as with some experiments with humans that have given their consent to deceptions, such limited and controlled laboratory "deceptions" of an AA seem harmless.

At a primitive level, we can view many kinds of present day security breaches as a person deceiving an AA about the person's identity. If (by one means or another) I obtain access to a system by pretending to be someone else, then I might be said to have deceived the system about who I am. However, most of these "deceptions" are relatively primitive with respect to the machine's view of the world. We do not think we have "fooled" a machine as much as we have misappropriated security information. The proper analogy is that we have taken someone's keys to gain access, not that we have "fooled the lock." There is much harm associated with unauthorized access to systems, and we aren't minimizing the significance of those harms; however, we are convinced that these incidents are not "deceptions" in the sense of trying to convince a person that something is true when we know it is false.

However, consider a different security case in the foreseeable future. Imagine a robot guarding a sensitive, and dangerous area, say the site of a recent nuclear accident. Assume that the robot is "autonomous" in the sense that there is no direct human control of the robot after deployment. The robot has been programmed to admit some people and to block other people, perhaps based on the person's job (e.g., firefighters are allowed, reporters are not). If such a robot has advanced learning capabilities, a person trying to gain unauthorized entry to the site might attempt to deceive the robot. If such a deception is successful, the robot would permit access to someone masquerading as a firefighter when he/she was not really a firefighter. In this case, the actions of the deceiver and the robot seem very much like a deception involving two humans.

It can be argued that the person trying to deceive a robot is actually deceiving the humans who developed the robot. We do not object to this characterization. However, there is an added dimension to the deception when the robot is autonomous. In the case of the autonomous robot acting as a guard, the deception is done most directly with the machine. There are two "intelligent" entities being deceived, the collective entity of the developers and the robot itself. We are *not* claiming that the robot has "intelligence" identical to human intelligence (thus the quotes); however, we *are* claiming that as AA development progresses, future machines will have functional information processing capabilities that are increasingly similar to human intelligence. We further assert that as these machines become more sophisticated, then strategies that people have used to deceive other people will be used to deceive these sophisticated machines. It seems both reasonable and accurate to use at least some of the terminology we have developed to describe human-to-human deception in order to describe human-to-machine deceptions, even though there are important distinctions between sophisticated machines and humans.

One of these distinctions is that machines may someday be better at detecting deception than most humans are. Researchers are working on software to detect micro-expressions that appear in human faces when they lie (Wilson 2011). While the researchers point out that detecting a lie is different than determining the truth, and lying is a more overt activity than deception, we consider the potential impact of developing software that detects deception—even just the fact that a human has tried to deceive it. This sort of relationship changes the power balance between the AA and the human as the AA is (presumably) capable of both practicing deception (that cannot be detected by even the most expert humans) and detecting deception. This creates an environment where the AA seems to have the upper hand in the relationship and raises the specter a power mismatch, reminiscent of HAL from the movie *2001 A Space Odyssey*.

If machines become capable of detecting human deception (benevolent or not), a question that developers will face is what should the AA be programmed to do with that information? The developer is faced with deciding *a priori* how to deal with deceptions, with little knowledge other than the fact that a deception has taken place. Floridi calls this "the Tragedy of the Good Will" (2013). Floridi identifies two different occurrences of the tragedy. In one, the Good Will is sufficiently powerful, but insufficiently informed; and in the other the Good Will is sufficiently informed but insufficiently powerful. The developer in this case has the power to do something at the time of

development, but will not always have appropriate contextual information to know what to do. Yet, the developer can imagine the moment after the AA is deployed where the deception is noted and even with that (meta-) information, the AA is powerless to do anything about it. One possible solution is to signal an alarm and stop the process. At this point human intervention might be necessary. This way, the human could take other information present at the time of the deception and, perhaps, avoid the Tragedy of the Good Will by assuming the power to act. The implication is clear: machines with these sorts of abilities—to deceive humans and to detect human deception—will change the nature of the world, and these sorts of machines "require an augmented ethics for the whole of humanity as the ultimate 'Good Will'" (Floridi, 2013, Ch. 10).

Curiously, while AAs may be able to detect deception in humans, they would face the same difficulties that people face when trying to detect deception in AAs. This observation lends further support to the claim that developers bear tremendous ethical responsibility for the technology they develop. Much of our social structure is influenced by technologies that cause people to make changes in how they behave.

4. Conclusions

Deception, a loaded philosophic term, is a live issue in cyberspace. Increasingly, some deceptions are being realized by machine masquerades. Whether to implement a deception, which implies success and misapprehension by users at LoAU, is up to the developers of software at LoAD. In some cases, as we have shown, this deception is benevolent, in that it is helpful for the users negotiating the often complex world of technology. In more malevolent cases, deceptive machines can cause great harm. This paper has explored several interesting mixed cases.

We conclude that deception by developers is of concern because it can lead users to make choices with ethical significance based on a deception. Consider a machine that is masquerading as a child. In an emergency people who think the machine is a human child and take extraordinary measures to save this "child," inappropriately put themselves and other people at risk. A less dramatic example is a person who invests time and energy in an online relationship, only to later find that the object of this effort was a cleverly programmed webbot. In both cases, deceived humans treated a machine in a way that was inappropriate because the humans were deceived. Significant harm can be done to people, even in cases where the harm was not intentional or anticipated.

While this paper was in development, a prominent U.S. college football player, Manti Te'o of Notre Dame, claimed that he was a victim of an Internet hoax. The "girlfriend" that he had talked about publicly for months was an online fiction (CBS, 2013). There is controversy about whether or not Te'o was a victim or a participant in this hoax; either way, this bizarre case illustrates how computer-mediated masquerades are becoming part of our culture.

Our default position is that deception is unacceptable, and benevolent deceptions are exceptions. This is true of masquerading machines, as well as other deceptions involving sophisticated machines. Responsible developers should make a case-by-case analysis of any deceptions they are considering implementing, and should justify why a particular deception should be an exception to the default prohibition. We contend that this ethical responsibility should be established now. We anticipate significant practical, ethical and legal problems in the foreseeable future when AAs become increasingly human-like. Users "enchanted" by masquerading machines are likely to make inappropriate decisions based on these deceptions; when these decisions have ethical importance, the deceptions also have ethical importance.

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INFORMATION WARFARE - ARE WE ALREADY AT WAR?

Olli I. Heimo and Kai K. Kimppa

Abstract
According to Pentagon, USA can consider an information warfare act as reason to use any weapons suitable as recourse. At the same time they, amongst others, are already attacking countries that they are not officially at war with information warfare weapons. In this paper we look at the currently known information warfare weapons used and whether they are morally or socially justified. First we define what we mean with information warfare in this paper. Then we look at the justifications used arising from the societies or other groups which are known to have used information warfare. Finally, we look at the possible moral justifications and their problems.

Keywords
Information warfare, Cyberwar, Just war, War, Transparency

1. Introduction

Acquirement of information warfare weapon systems (IWWS) is a current trend around the world. Countries and military alliances are developing new IWWSs for defensive, counter-offensive and offensive purposes. (US Department of Defense, 2005, Wu, 2006, YLE 21.1.2009.) These weapons, however, are of a different kind compared to traditional warfare equipment. Ethics of information warfare has been discussed for a long time, but the discussion has been more about the usage of IWWSs with traditional weaponry, e.g. surveillance before missile attacks, rather than substituting it. *Why fly bombers in enemy airspace, if you can destroy the infrastructure by sitting in a comfortable office?*

In this paper the point of secrecy with the modern IWWS is a central topic, i.e. do the citizens know what is done with their mandate to protect their country? When these acts of war are conducted, who are the people doing these decisions and what are 'we' even capable of doing? On what kinds of moral (and other) decisions is the use of these weapons based? Until today, only China (F-Secure, 2011) has shown their capabilities of information warfare to their citizens, whilst the open democracies in the west have been as silent as a grave, with the exception of Stuxnet which the US government recently took responsibility of (NY Times 1.6.2012).

The societies around the world have been computerized during the last couple of decades and hence they have become more and more dependent of information systems. Fall of these systems is seen more and more as a threat against national security. Need for a functioning information warfare capability, mainly a defensive one, has been rising for some time. Of course, because acts of war mostly rely on the possibility to cause more harm and casualties to the opposing force than suffered, the possibility to destroy or harass opponents' electronic infrastructure is a tempting option: no casualties on one's own side and a plenty of harm to the other side.

Cyberwarfare is something that is happening here and there, every now and then; in a way, all the time, as in the use of Echelon. It currently can be considered warfare without the proclamation of war or – like in the Bronze soldier crisis (The Guardian, 17.5.2007, Ottis, 2008) – outsourced war. Should the citizens of a democratic country be aware that their nation is at war?

2. Information Warfare

During the last couple of years, few large warfare-like internet conflicts have emerged. In 2007, during the internal Estonian bronze soldier conflict which escalated to an international conflict between Estonia and Russia, many Estonian information services were attacked from Russia with an effective blow to the infrastructure. The attack was largest information warfare attack ever made, by

the length (3 weeks) and was focused towards governmental services, banks and media. Russia proclaimed that the attack was not done by the government and accused the nationalistic youth movement Nashi (which is heavily supported by Kreml). (The Guardian, 17.5.2007, Ottis, 2008.) Another Russian information warfare attack was apparent during the Georgian conflict in 2008. A large distributed denial of service (DDoS) attack separated the whole country from the Internet whilst Russia began its invasion with land and air forces. The Guardian reported the conflict as the first possible modern cyberwar. (The White House, 2009)

Not all of the weapons used in information warfare require the presence of the warrior behind the keyboard. The best example so far is a worm commonly known as Stuxnet. It was considered a military grade smart weapon designed to seek and destroy a target in real-world (Schneier.com, 22.10.2010, BBC, 23.10.2010, 22.11.2010, Langner, 19.11.2010) already before the revelation that the US was behind it. It was precisely programmed to target specific Siemens Simatic S7 Logic controllers, indistinguishably similar to which were used Iranian nuclear facility in Natanz. Thus the enrichment program was successfully delayed due to broken centrifuges for an extended period. (F-Secure 2010/1, F-Secure 2010/2) It was a mystery for a long time, whichever government - if any - was behind the operation. The government of the United States took the responsibility as late as 2012 (NY Times, 1.6.2012). The same analysis of course considers the Flame malware (see e.g. Washington Post 19.6.2012). Compared to Stuxnet which is a strike-malware, Flame is a cyberintelligence malware designed by US-Israel cooperation to "scout the terrain" and gather military intelligence, possibly for Stuxnet. The geographical spread similarities are backing up this theory. (BBC 4.6.2012, Washington Post 19.6.2012)To raise a central question: should the citizens of a country be aware of its modern information warfare attacks?

As an extension of information warfare, information technology based warfare, such as drone attacks in countries with which the drone using country is not in war with. An example would be the US using drone attacks in a country such as Yemen (to kill a US citizen, no less) (The Tech, 2002; for other examples, see e.g. Bissett, 2003). Does this constitute an act of war, when US is not in war with Yemen, yet does military acts within its borders?

Lately hacktivism, especially hacker groups like Anonymous and LulzSec have drawn attention towards cyberwarfare (BBC, 5.6.2011, 15.6.2011, 16.6.2011, 21.7.2011, 31.10.2011, CBS News 21.6.2011). Governments and large corporations alike are being targeted by hacker activists - hacktivists - around the world. None-the-less, due to the anonymous nature of these activists, there is no proof for whether they have conducted all or even some of these actions. The motivations behind these kinds of attacks can vary from political aims to financial gain. Some, like the aforementioned Nashi, can be blamed for whenever the necessity for plausible denial comes in handy, and others can be derived from the imagination. Many governments could benefit from this kind of activism and they might be doing all or some parts of it. Ottis (2008) states, that *"[t]he beauty of people's war is, that it provides near-perfect deniability for the government or any other entity that is behind the attacks"*, even though Ottis refers to Chinese "people's army", it can be expanded to mean any people, anywhere and with any motivation. Thus we argue that all the aforementioned cyberwarfare not actively denied and pursued by the government should be counted as government-done acts of war.

During the last months, the discussion about the Chinese cyberattacks has been a topic of discussion both in the media and in diplomatic discussions. In this paper, however, they are not discussed any further. That is because of the sporadically revealing nature of cyberwarfare activities.

3. Societies Participating in Information Warfare

"It is in this last category [cyber-security] that our concerns have moved to the forefront of our agenda. I am not talking about ordinary cybercrime or hacking. And, this is not solely a national security concern or a concern of the U.S. government. Increasingly, U.S. businesses are speaking out about their serious concerns about sophisticated, targeted theft of confidential business information and proprietary technologies through cyber intrusions emanating from China on an unprecedented scale. The international community cannot afford to tolerate such activity from any country. As the President said in the State of the Union, we will take action to protect our economy against cyber-

threats." Tom Donilon, National Security Advisory to the President of United States of America (The White House, 11.3.2013.)

The world of information warfare can be divided in four major powers of the world. These IW superpowers make a most – if not all – of the known information warfare. The three superpowers of the world, China, Russia and USA (together with their allies), are obviously represented in this notorious four, which is completed with the new information age superpower – the residents of the Internet.

As mentioned earlier, only China (F-Secure, 2011) has shown their might in information warfare to their citizens, whilst the more open democracies in the west have been as silent as a grave, with the exception of Stuxnet for which the US government finally took responsibility in 2012 (NY Times 1.6.2012). Russia openly uses cyberwarfare during different crises (The Guardian, 17.5.2007, Ottis, 2008) while still denying its use. Still, with all these (and other) countries keep their full capability as a secret.

One interesting point with the aforementioned superpowers is the difference in governance. While China is a communist oligarchy, Russia struggles with its image as a democracy and USA is acting as a representative democracy, a part of the Internet organisations like the Anonymous are anarchistic organisations (while some can have a governance of any sort). This anarchistic, somewhat leaderless discussion-based acting of anonymous bodies in governance enables the transparency of the decision-making and the immediate knowledge about the cyberattacks being done. Analysing this kind of activity is the most common way for the citizens of the world to understand what might be possible with the IWWSs.

As the world is now awakening to the need of cyberdefence and to the fact that cyberoffense being an important part of a military strength, the knowledge about the capabilities is – as mentioned before – still largely a secret. This *"security through obscurity"* – while possibly strengthening the capabilities for acting – is alarming in the view of a common citizen. They can be assured for their security by the numbers their military provides as well as their own government's capability to use the traditional military might against them, but to trust to or to protect oneself from something they do not know exist is a much harder requirement.

4. Critique on Justifications for Information Warfare

As pointed out by the US Department of Defense (2011) any attack by the use of information warfare weapons can be responded by "all necessary means" (p. 2), which in itself is understandable. Unfortunately, the US is not in the habit of accepting the same for the opposition (see e.g. Chomsky, 2002 on terrorism), although the same DoD report does claim so ("All states possess an inherent right to self-defense", US Department of Defense, 2011, p. 2). Should e.g. Iran use "all necessary means" (whatever those might be) to stop the US from using IWWS, such as Stuxnet on them, I doubt the US would agree on their own definition (again, see e.g. Chomsky, 2002).

An argument for IWWS is that they (can) save lives compared to traditional weapons. It can even be argued, that we have a duty to develop weapons which save lives compared to traditional weapons (De George, 2003), and IWWS could be seen as prime examples of such weapons. The main problem with this argument is apparent again in the USA vs. Iran Stuxnet case, but also visible in the late Chinese use of IWWS against the USA – neither of these attacks would have likely been made *at all* if IWWS was not available. A similar argument has been pointed out by Andy Bissett (2003) in relation to 'smart weapons' – wars in which 'dumb weapons' would have to be used, could be harder to start *at all* if the aggressor could not hide behind the idea of smart weapons being 'surgical', and 'only hitting the bad guys'. A state of war can be argued to be more likely to result in other attacks than IWWS attacks eventually.

Hactivist argument for using IWWS is that it is the only way to effect the situation. This of course is partly true. In the democracies the society should provide a channel to influence without resorting to extra-parliamentary actions. The validity of these claims is of course relative to the existence and

quality of these channels in the location these accused terrorists – or praised freedom fighters reside. Without a doubt this validation is harder because the international nature of hactivism.

We are stronger and we can, thus we do (might makes right) is a normal policy from the aforementioned superpowers of the world. The enactment as a world police requires this policy to be extended to any means – especially against the "terrorist states", and thus is no different than the occupation of Afghanistan, Iraq, Georgia or Tibet. Understandably this sort of reasoning lacks the basic principles of ethics (cf. Rousseau).

Although the usage of IWWS is usually considered as military intelligence and thus under a veil of secrecy. Therefore the aforementioned justifications in a context of governmental-based information warfare are per se secret black-ops operations – with the deniability or possible scapegoats hanging in case the operation is a failure. Only in few cases – e.g. Stuxnet – the governments have been open in their usage of IWWS, but only after the mission has been a success. Failed missions and the unethical actions have not been admitted.

The justification for the NGOs, e.g. the aforementioned Anonymous, LulzSec, and various terrorist organisations is clear: it is the only way. Without this possibility the organisations would be either massively less powerful or not been founded at all. The acts are usually justified with common sense and the necessity of the response to immoral behaviour (by their definition).

The states however have few optional approaches, e.g. traditional military activities and – surprisingly for some politicians – diplomacy.

5. Discussion

The cyberattacks and methods presented in this paper represent a specific part of information warfare technologies. The enabler to the ethical discourse about this topic lies not within the capabilities of the IWWS, but within the current secrecy of the arms race and the usage of these weapons compared to the traditional warfare. These weapons differ from all other arms we have seen so far by the possibility of secrecy internal to them. The procedures and policies of the IWWS usage is not public due to their history of being weapons for intelligence agencies. As shown with the Stuxnet case, they can be targeted towards specific targets doing large havoc, and hence the citizens should have more possibilities of knowing and deciding whether they are used and when, *especially when official war is not declared*. That ethical decision should not lie within the obscurity of a secret military actor.

To use information warfare defensively, that is, actively responding to potential external threats seems to be morally acceptable, at least if no loss of life is caused through doing so. Attacking during official peace is, however clearly more problematic. The citizens, through their representatives have typically not agreed upon initiating a war against a foreign nation, yet, in practice (as according to US DoD) using information warfare is an act of war.

In information warfare, as in a lot of government information systems usage, the citizen has no recourse to an option on whether the IS is used by the government or not, as no viable (or legal) alternatives exist. Information warfare is nowadays considered as military intelligence and thus these actions are being classified on a need to know basis, with relevant facts possibly to be revealed later (at times decades later). Thus when the acts of information warfare are conducted, the government should have a mandate of the citizens and thus the secrecy of the military intelligence should be lifted, for the primary required knowledge to seize, to end or to prevent the wars is to be aware of them.

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RESPONSIBILITY IN ACQUIRING CRITICAL GOVERNMENTAL INFORMATION SYSTEMS: WHOSE FAULT IS FAILURE?

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Abstract
In this paper we aim to show that a responsible party for acquiring critical governmental information systems should be nominated and that the expected consequences must be analysed before the project is started. This is to prevent loss of human life, to enhance well-being, to secure a democratic process and civil rights and to save resources. Our approach is to increase public participation as well as the participation of different interest groups derived from the critical governmental information system development on enhancing these systems. We use Habermasian discourse to enhance the process of procuring, developing and implementing these systems and apply it to the idea of responsibility towards the society.

Keywords
eGovernment, System Procurement, Responsibility, Habermasian Rational Discourse, Information Systems

1. Introduction

Governmental information systems (eGovernment systems) have been in an increasing development during last few years. As private sector has increased their profits with increased and centralised information systems there has been pressure for the public sector to utilise this same behaviour for the diminished resources allocated to it. Unfortunately, the effectiveness intended has not always been the result. In this paper we concentrate on the governmental information systems defined as critical – their definition, the responsibility around them and the possible ways to improve the procurement, development and implementation of these systems.

The responsible actors in this context must be defined to verify the underlying responsibility in the information systems that can compromise the health, security and wellbeing these kinds of systems should provide. This responsibility, as well as the base functionalities, we argue, can be defined best through a rational Habermasian discourse.

The current status quo, as is shown below, is a situation where the current infrastructure cannot function efficiently, economically nor ethically. Thus we require new ways to determine the functionalities, responsibilities and requirements for the critical governmental information systems guarding the health, safety and wellbeing of the society at large.

2. A critical governmental information system

A critical governmental information system (CGIS), by definition, is an information system developed for governmental needs including data or functionality which is critical in nature to the security or wellbeing of individuals or the society as whole. It is a system where something invaluable can easily be compromised. These kinds of systems include eHealth, eDemocracy, police databases and some information security systems e.g. physical access right control.

Numerous studies show that due to poor eGovernment solutions lives have been lost, for example in case London ambulance due to the new information system ambulances were sent to wrong targets, causing several deaths and injuries (Avison & Torkzadeh 2008, p. 292-293), usage of dysfunctional radiation treatment machines caused at least six deaths (Fleischman 2010) and elections have been compromised numerous times worldwide (Mercuri 2001, p. 13-20, Heimo, Fairweather & Kimppa

2010, Robison 2010). Simultaneously huge amounts of resources (Larsen & Elligsen 2010) are wasted, while the systems are either inoperable or end up being discarded (Wijvertrouwenstemcomputersniet 2007, Verzola 2008, Heimo, Fairweather & Kimppa 2010, Heimo, Hakkala & Kimppa 2012, Koskinen, Heimo & Kimppa 2012). Thus, while developing critical governmental information systems, there has been major problems, in situations where there is little room for error.

3. Responsibility revisited

To verify a secure system a specific party has to be responsible for the system development and upkeep process. That is a job the society as a whole has given to a third party, as not everyone can participate to the process. This *responsible party* has to see to it that the system works as it should.

Four different interest groups can be found in eGovernment system development process: 1) *the government office*, whose task is to formulate the solutions to fulfil the needs of the society, 2) *the producer*, who delivers the requested system, 3) *the end-user group* consisting of people using the system and, 4) *the citizens*, who are the targets of the system usage. Any or all of the groups can overlap.

The power to decide how to design and whether to implement the system lies within the government and the supplier; the user and the target of usage are in weaker positions, for they have little or no power in designing the system. We agree with Rawls (1997) that any change in the procedure must be to the advantage of the weakest parties. And as with the power to decide for the public comes the responsibility to the public. That responsibility has to be either with the subscriber or the supplier. The responsibility with the supplier lies in fulfilling the requests of the customer, i.e. the governmental office. If this task fails, the supplier is responsible to the authorities for their failure of not fulfilling the requirements agreed upon.

The authorities have a monopoly in supplying certain services like critical eGovernment products. Due to this, they are in the supplier role *in relation* to the citizen. That role brings with it the responsibility of a functioning product. If the system is taken into use the responsibility lies with the last supplier of the system: the government office.

The eGovernment system producer produces a system according to the specifications they receive from the ordering party, i.e. the government office. Even if the product is faulty and does not fulfill the specification, the authorities are responsible to audit the product. The responsibility for showing that a product is faulty, cannot, however rest on the end-user, but the provider or the distributor must provide sufficient proof that the system is safe.

Obviously the people auditing the systems must be accountable for their work and the government office must select a party able to successfully complete the auditing (internal or external). They have to be trained and given the accountability for what methods of auditing are required and how the results have to be interpreted. Either the security of the system itself has to be greater than the previous systems', or, at least the added value the system provides to the citizen must be – together with an adequate level of security – considerable to justify changing systems. A method to gain the necessary skills and specifications is to use a rational discourse, e.g. the Habermasian rational discourse.

4. Requesting reasonable communication – the Habermasian discourse

In this paper the topic is approached from a Habermasian (1992) rational discourse perspective, which denies strategic games so common in current political systems. The Habermasian view is considered an acceptable way to share responsibility and thus justify rationally decided actions in eGovernment procurement.

As mentioned earlier, the current situation is problematic because many governmental actions are commonly lacking the support of the citizens. Reason for that can be that people cannot be fully active part of political system. In current political system the decision making is moved to different

organisations or stakeholder groups which are not in public sphere, like Habermas (1962) was already pointing. There seems to be less and less culture of participating in political activities thus the citizen's only actual way to influence the policies of the society is voting, but the main problem lies within the lack of proper argumentation (clearly and defined) through the voting. Therefore we call for bringing the rational discourse back in politics and, in addition to that, put it generally into use in society at large.

Habermasian rational discourse sets a demand for all the subjects of legislation to be subjects of discourse. Additionally, the discourse must be constructed in such a way that it is based solely on rational arguments (i.e. no strategic games allowed) and every attendee has an equal possibility (may need information and education) to take part in the discussion with proper argumentation.

Without the possibility for all the subjects to be a part of defining the rules or legislation there will be lack of justification of rules or law. For example, in the Finnish legislation there is usually no possibility or right for citizens to appeal to Market Court on cases of procurement of public sector (Heimo, Koskinen, Kainu & Kimppa 2013). This is problematic, because the public sector is acting for the people, and thus it should be responsible to the people. The contradiction between the law and the sense of justice is not strengthening the legitimacy of the law.

If the Habermasian rational discourse would be taken as a procedure in procurement, development, implementation and evaluation of critical governmental information systems, many of the aforementioned problems could be prevented. For example, the different stakeholders should be involved and decisions could not be made only as an official duty by a bureaucrat. When all parties are heard and taken into the active participation process, the outcome (consensus) of the discourse would be more likely applicable and fulfil the interests of society.

Thus we have different levels in society where the rational discourse should be implemented: political level, administrative level and the level where things are realised. It has been argued that implementing rational discourse in law making is impossible in such way that the demands set by Habermas would be fulfilled (see e.g. Mezirow et al. 1990). Thus, the rational discourse is an ideal situation impossible to reach in reality. Nevertheless, we argue that with implementing a rational discourse, even with its flaws, we still can endorse the people's involvement towards matters of society of their own and thus improving democratic (participatory) system and strengthen the justification of the regulation of the society.

5. Discourse on discourse

In many countries (e.g. in Finland, Ireland, Netherlands and the USA) the end-users (specialists, citizens, NGOs, etc.) have been able to show that there are critical problems with the system, but only after the systems' publication (see e.g. Mercuri 2001, Harris 2004, Wijvertrouwenstemcomputersniet 2007, Heimo, Fairweather & Kimppa 2010, Heimo, Hakkala & Kimppa 2012). In these cases the producers and the government officials are defending their position against the end-users and the public (and the aforementioned rational discourse denies this strategic game). Because of the government monopoly, the obvious responsible party is, maybe counter to intuition, the subscriber, *not* the producer of the system.

We propose as a way to spread the responsibility is Habermasian discourse because in that case different stakeholders have equal possibility to take part in the process. Laws, regulations and codes of conduct should be made to prevent any strategic games and deception. What kind the aforementioned laws should be is out of scope of this paper and will not be discussed here.

Pantzar (2002) generalizes MacKenzie's (1990) theory of the *Certainty Trough* to all technology. Pantzar claims, that the salespersons of the product – the representatives of the producer – are denied their right to be uncertain of the product they are selling. In a modern society there is a risk, that this reflects to the suppliers – the government offices' – representatives so, that even they cannot appear to be uncertain of the product when introducing it to the citizens. In a situation where this risk actualises, the information the government officials give to the public is misleading.

For preventing a situation where officials have ended up in a position where they are giving misleading information to secure their own status, we must bring forth *discourse on discourse*. The Habermasian discourse must be introduced to implement such conditions where public decisions are brought into public, Habermasian discourse. Hence, we must have the processes of: procurement, decision, development, implementation and evaluation of critical governmental information systems. By bringing discourse to be a part of all stages of the process we can more likely avoid a situation where the problem is a problem of missing responsibility. It is a necessity to have a discourse for having reasonably allocated responsibility when developing critical governmental information systems.

If the aforementioned discourse on discourse is implemented, it is harder to cover up mistakes made in the process. Moreover, mistakes which are made are not so easy to pour on for some, unlucky scape goat or just endlessly tossed around. This way the organized process is more transparent, just and verifiable.

Thus the Habermasian discourse is not to be implemented only to verify the quality of the CGIS, but also to protect the rights of the individuals and the interest groups; to create improved rules to make the game fair; this of course in addition to the value created by the participatory democracy.

6. Conclusions

It is obvious that the development of critical governmental information systems should be done responsibly. This responsible development however is impossible without the definition of who the responsible actor is.

From the four basic interest groups, the government office, the producer, the end-user group and the citizens, it seems clear that the fundamental responsibility rests with the authorities. They hold a monopoly to the services they have been nominated to produce, control and upkeep and are in superior position in relation to others and thus with great power comes great responsibility.

Therefore the final responsibility lies with the government representative, but, in how the responsibility before the system is released and who is responsible for fixing possible mistakes must be defined through a Habermasian discourse. Also, in cases where the government officials have been purposefully mislead, the responsibility can be repositioned.

Because of the human life is an end in itself (cf. Kant), it seems impossible to actualise the responsibility towards one person – or even a group of people – as a means to repay the mistakes. Therefore we need a Habermasian discourse on how the responsibility should be realised and for what ends. Also we need to modularise the responsibility with various actors in various fields of the lifecycle of the IS.

The Habermasian discourse's main target of application however should be the way the CGISes *should be constructed in the first place*. To guarantee the quality of these systems and to minimise the need to actualise the responsibility thus promoting health, security and wellbeing we should embrace the Habermasian discourse. When, however, the procurement, development and implementation of CGIS is done without the responsibility and accountability of anyone and without the required level of rational public discussion, it can and has already endangered these fundamental values we hold dear.

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COMPUTING FUTURES: MIRACLES, PROPHECY AND PREDICTION

David Sanford Horner

Abstract
This paper argues that the reasons for rejecting any particular prediction about the possibilities and impacts of emerging technologies will always outweigh the reasons for acceptance of such predictions. The first move in the argument is to question the distinction between prophecy and rational forecasting. The paper then moves to argue that prophecies and predictions are like miracles. Using David Hume's 'decisive' argument in 'Of Miracles' we can then show why the weight of evidence must always be against the veracity of prediction. This position is then supported by a number of subsidiary arguments concerning human credulity and fallibility.

Keywords
Anticipatory Ethics, Forecasting, Epistemology, Hume, Miracles, Prediction, Prophecy

1. Introduction

The aim of the paper is to show why the reasons for rejecting any particular prediction about the future of emerging technology, together with its ethical implications, will always outweigh the reasons why we might accept such a prediction as evidence of future states of affairs. If this argument carries any weight then it must seriously undermine the idea of 'future proofing technology ethics'. In developing this argument I use Section X, Of Miracles, from David Hume's *An Enquiry concerning the Human Understanding* (Hume, 1902). In Section X Hume's aim is to show why miracles could never be accepted as proof of the existence of God. In his discussion of miracles Hume provides us with a profound methodological reflection on the nature of historical evidence (Flew 1961). These methodological reflections it seems to me are equally applicable to the endeavours of forecasters and futurists. Notably, but often overlooked, Hume towards the end of Section X writes that the same arguments against miracles apply to prophecy; 'all prophecies are real miracles'. Again Hume's object here is to show that prophecies (meaning religious prophecies) can never constitute compelling evidence for a belief in a deity. My contention is that we can apply the form of Hume's argument to the case of technological forecasting. What are forecasters trying to do? They are attempting to suggest that their predictions provide evidence for belief in some future states of affairs even if these are represented in a probabilistic way. And what's more that their predictions are well founded enough to help decision-makers formulate policy, i.e. 'evidence-based' policy. These claims I want to show have direct (logical and epistemological) parallels with a belief in miracles and prophecy as foundations for a true belief in a deity.

2. Overview

In Section 3 a distinction is drawn between prophecy and rational forecasting. There are in the literature persuasive arguments for the utility of anticipatory technology ethics. Strenuous research efforts are made to provide decision-makers with evidence robust enough to sustain policy. However, I claim that this leads to a number of paradoxes which undermine the utility of prediction especially in relationship to policy making. Policy makers may want an evidence base for their decisions but can social and technological forecasting really provide it? My argument is that the distinction between prophecy and 'rational' forecasting is less clear cut that we might want to believe. And like Hume's infamous argument against the possibility of miracles this is fundamentally a question of evidence. In Section 4 the case is made for logical and empirical connections between miracles, prophecies and forecasts. This is achieved by reference to Section X, Of Miracles, from Hume's *An Enquiry*

concerning the Human Understanding (Hume, 1902). Hume presents a 'decisive' argument against the possibility of miracles. This argument he believes is a 'check' against superstition and error. Hume's attack on the possibility of miracles as a proof for the existence of the deity falls into two parts to be discussed in corresponding sections of the paper. In Part I Hume argues the practical improbability of miracles as a matter of principle and some commentators (see Swinburne, 1970) have dubbed this an *a priori* proof: '...That no testimony is sufficient to establish a miracle unless the testimony be of such a kind, that its falsehood would be more miraculous, than the fact, which it endeavours to establish' (Hume, 1902, p.116). In Part II Of Miracles, Hume presents us with four *a posteriori* arguments against miracles. My objective is to show how we can translate Hume's arguments to illustrate that rational forecasting is more like prophecy than we might care to admit and that 'all prophecies are real miracles'! This bears directly on the question of whether or not we can anticipate the possibilities of ethical ICTs

3. A Case for Rational Technological Forecasting

The theme of this paper is the continuance of a belief that it is important to predict possible futures for emerging computing technologies in order that we might better exert moral control over their development. But the evidence is overwhelmingly that our confidence in such an endeavour is deeply problematic if not utterly misguided. If we are thinking about forecasting the future of computing technologies and their social and ethical impacts do the methods we use produce accurate predictions? The short answer to this must be 'No'! (See, for example, Gardner, 2011; Horner, 2004; Seidensticker, 2006; Sherden, 1998; Taleb, 2007)

Now it might be argued that this must be going too far and too fast. Empirically surely there is evidence of successful technological prediction? Ray Kurzweil of MIT, for example, claims much successful anticipation of developments in computing technologies (Kurzweil, 2005) and surely we can make, an important distinction between 'prophecy' and 'rational forecasting'. Nostradamus is one thing but the ETICA study, for example, is altogether different (Stahl, Rainey and Goujon, 2011)! But where does this difference lie? The philosopher A.C.Grayling (2001) argues that prophecy and rational forecasting start from fundamentally different premises. Prophecies assume that 'what will be, will be'; the future is already decided. The prophet is one who has special vision which penetrates beyond the present temporal horizon into a pre-existing future. In contrast forecasting studies assume that in some sense the future is open and the object is to provide an assessment of possible alternative futures. Such rational assessments are essential for planning. It is assumed that by the careful use of current data and past experience (i.e. observation and testimony) we can predict the (probable) course of events. By an intelligent understanding of past and present we can 'make the future'. To do anything else must be to surrender ourselves to passivity and hopelessness in the face of events.

In this vein the ETICA project was '...a bold attempt to visualise possible futures for emerging ICT to help decision-makers operate in an ethical framework when developing them' (Future-proofing technology ethics, 2011, p.4). However, in the project's prospectus is a clear recognition (unlike religious prophecy) that predictions are notoriously fallible, for example, 'the certainty of predictions decreases with the temporal horizon of the prediction', and that '...the claims to truth that the project raises are not strong or comparable with those arising from traditional scientific research. Instead the point of the project is to give input into societal, research-oriented and policy discourses about how technologies can affect our future.' But even with such heavy qualification for the enterprise to make any sense there must be some residual faith in the veracity of the 'possible futures' that are being presented.

There are several paradoxes embedded in this belief about the possible visualisation of possible futures. The first paradox is this: on the one hand if the predictions of future states of the world are to be helpful to decision-makers then they must provide genuine evidence of what will happen but on the other hand most serious technological forecasters recognise to some degree the difficulties and uncertainties of prediction, or even more strongly, recognise that our technological futures are fundamentally unknowable (Brey, 2011; Stahl, 2011). A second paradox is that to the extent that technological forecasts have a social function as part of a decision-making process they may be either

self-fulfilling or self-defeating. But the extent to which forecasts are self-fulfilling or self-defeating undercuts their cognitive status as truths about some future state of affairs. If we are not right we make it right. But isn't talk of 'the certainty of prediction' already to fall into the trap that there is any sense in the idea that anything may be known to be true in advance? Rightness or wrongness in relationship to prediction is logically retrospective (Ryle, 1973, p.27).

4. 'All prophecies are real miracles'

In what follows my intention is to show that rational forecasting is pretty much like prophecy and a prophecy is a miracle! Hume's attack on the possibility of miracles as a proof for the existence of the deity falls into two parts. In the first part Hume (1902, pp.108-116) provides what he believes to be a 'decisive' argument against the possibility of miracles and thus the possibility of using an argument from miracles in support of a belief in a deity. In Part II of Section X Hume goes on to outline four *a posteriori* arguments in support of his 'decisive' argument. But let's first examine his 'decisive' argument and its link to prophecy and prediction.

4.1 Section X: Part I: The a priori Argument

The crux of Hume's argument is about what counts as evidence and how we weigh evidence. Technology predictions are based on the testimony of experts (the Delphi technique, for example) or on experience (the extrapolation from what we know of the past into the future). Observation and testimony are notoriously fallible and must always be weighed against contrary observation and testimony. Now the problem with miracles, and as we will see prophecies and predictions, is that by definition '...A miracle is a violation of the laws of nature; and as a firm and unalterable experience has established these laws, the proof against a miracle, from the nature of the fact, is as entire as any argument from experience can possibly be imagined. Why is it more than probable, that all men must die; that lead cannot, of itself, remain suspended in the air; that fire consumes wood, and is extinguished by water; unless it be, that these events are found agreeable to the laws of nature, and there is required a violation of these laws, or, in other words a miracle to prevent them?' (Hume, 1902, p.114)-115)

In other words by their very nature miracles must run directly against the grain of our knowledge and attested experience of the world: to believe that a miracle has occurred is to believe an event has happened which runs directly contrary to the weight of (inductive) evidence underpinning a law of nature. From his discussion of the nature of evidence, proof and probability Hume goes on to formulate his maxim; the knock down argument against miracles: '...That no testimony is sufficient to establish a miracle unless the testimony be of such a kind, that its falsehood would be more miraculous, than the fact, which it endeavours to establish; and even in that case there is mutual destruction of arguments, and the superior only gives us an assurance suitable to that degree of force, which remains, after deducting the inferior.' (Hume, 1902, pp.115-116). If confronted with two miracles (!) then we must always reject the greater miracle according to this maxim!

It is important to recognise that Hume's concern was not to establish that miracles just do not occur but that we can never be in a position to positively know that they have occurred (Flew, 1986, p.80). (But, of course, Hume in Section X leaves us in no doubt that his own belief is that miracles have not and do not occur.) The function of Hume's maxim is precisely a 'defensive' one; it is designed to provide a check on prejudice and unfounded beliefs: '...Nothing is so convenient as a decisive argument of this kind which must at least *silence* the most arrogant bigotry and superstition, and free us from their impertinent solicitations'. He goes on in the same paragraph to claim that he believes he has 'discovered' an argument '...which, if just, will, with the wise and learned, be an everlasting check to all kinds of superstitious delusion, and consequently, will be useful as long as the world endures.' (Hume, 1902, p.110). Well no mean claim but note the caveat 'if just'.

My contention is that Hume's maxim is as applicable to (rational) technological forecasting as it is to miracles and to (religious) prophecy. It is not often noted that Hume, towards the end of Section X, writes that the same arguments against miracles apply equally to prophecy; 'all prophecies are real

miracles'. Prophetic utterances are, like miracles, part of the armoury of belief in a deity. But Hume argues the same 'decisive' argument that applies to miracles applies also to prophecies. The weight of evidence must always be against the truth of prophecy: '...if it did not exceed the capacity of human nature to foretell future events, it would be absurd to employ any prophecy as an argument for a divine mission or authority from heaven' (Hume, 1902, p.131). A claim to positively to know the future must be a kind of violation of a law of nature because it must always 'exceed the capacity of human nature to foretell the future'. Prophecies and predictions can only be known to be true after the event. The predictions of Old Testament prophets as to the coming of the Messiah, for example partake as much of the miraculous as Jesus raising Lazarus from the dead.

Hume's Check is equally applicable to those who claim to be able, rationally, to foretell our ethical and technological future as to as on the claims of prophecy and miraculous. The distinction between prophecy and rational forecasting is not tenable. As Stahl (2011, pp141-142) writes that: 'It may be too obvious to state, but in order to avoid misunderstandings, it may be nevertheless be necessary to underline that we do not know the future. The future is fundamentally characterised by being unknown and unknowable'. Amen. But, he goes on: '...there are reasons to believe that some aspects of the future are predictable and, in fact, much of the organisation of societies is based on the predictability of the future. Commercial and administrative activities rely on recurrence of activities and usually rightly so, and to some degree this predictability extends to technologies.' There might be 'reasons' but this does look a bit like having your cake and eating it. Isn't this 'expectation' rather than prediction? And look how often even such expectations are dashed. More tellingly an important point is that when we are talking about technological and social innovation we are precisely not in the realm of regularity but in the realm of novelty and creativity, of things we have not known before.

Let's take admittedly an extreme example, Kurzweil's prediction of the coming of 'the Singularity', the union of humans and machines, the next step in evolution predicted to occur in 2050. Kurzweil certainly claims this is a rational prediction based on multiple extrapolations of some current technological trends. But the question here is the status of evidence. The claims about the Singularity are neither true nor false at the time they are made and the weight of evidence must always be in favour of such claims turning out to be false; the larger the claims the wider the scope for falsification. No testimony is sufficient to establish a prophecy unless the testimony is of such a kind, that its falsehood would be more miraculous, than the future fact, which it endeavours to establish. Our default position must be always be to reject a prophecy as unbelievable. And in that sense we should never accept forecasting as a basis for policy-making!

4.2 Section X: Part II: the *a posteriori* arguments

After his presentation of his 'decisive' argument against miracles Hume goes on to supply a set of subsidiary, supporting arguments. Having apparently left the door slightly ajar to the possibility of miraculous occurrences Hume moves swiftly to slam the door shut. Part II of Section X presents four supporting reasons for his 'decisive' argument. The first three of these points are largely historical and empirical observations all tending to demonstrate the credulity of human beings and the susceptibility to believe what is all too frequently against the evidence. The fourth argument is a logical point about conflicting evidence. Again I believe these arguments about human credulity are equally solvent against claims to foretell our technological and social future.

Firstly, Hume claims that: '...there is not to be found, in all history, any miracle attested by a sufficient number of men, of such unquestioned good sense, education and learning, as to secure us against delusion in themselves' (Hume, 1902, p.116).

Most predictions about the future trajectories of technologies will have many and often contrary, variants. For example, there are widely differing views about the future trajectory of nanotechnology and its social impacts (Horner, 2005). Experts contradict each other, are frequently mistaken, and frequently deluded (Gardner, 2010). The RAND Corporation in the 1960s, the archetypal bastion of rational forecasting and futurism predicted that a permanent base would have been established on the moon before the year 2000 and that men (sic) would have flown past Venus and landed on Mars (Gardner, 2011, p.10).

Secondly, Hume observes that our ordinary ways of common sense reasoning are easily subverted. We draw the contrary conclusions to those we ought to draw and are too readily apt to be seduced by 'the passion of surprise and wonder'. In the same way we are frequently misled by claims that some new technology will sweep all before it. Whilst at the same time we fail to identify what is truly transformative. What should alert us to the falsity of some claim ('any kind of prodigy') is taken as the proof of its veracity. The fact that some claim is out of the ordinary and conflicts with our common experience and knowledge ought to put us on our guard. But the very opposite occurs: 'If the spirit of religion join itself to the love of wonder, there is an end to common sense; and human testimony, in these circumstances, loses all pretensions to authority. A religionist may be an enthusiast, and imagine he sees what has no reality: he may know his narrative to be false, and yet persevere with it, with the best intentions in the world, for so holy a cause...' (Hume, 1902, pp.117-118). The spirit of credulity still walks abroad but the 'holy cause' is now that of 'progress'. How can we forget claims for atomic power that it would produce electricity that would be too cheap to meter? Or the claim that automated production would bring in an age of leisure? Or the current claims of Trans-humanists that we will be able to 'down-load' ourselves (our brains?) for future immortality. Again Kurzweil's prediction of 'the Singularity' might serve as a paradigm case here; the term itself expresses its very contrariness to our everyday frames of reference.

Thirdly, Hume observes that miracles are: '...observed chiefly to abound among ignorant and barbarous nations' (Hume, 1902, p.119). What are we to make of what we would now no doubt consider a highly prejudicial and politically incorrect claim? Hume as a protagonist of the Scottish Enlightenment and later, of course, the great historian, takes an evolutionary view of social development. He suggests that when we read the histories of nations we imagine ourselves to have been transported into a different world: 'Prodigies, omens, oracles, and judgements quite obscure the few natural events that are intermingled with them. But as the former grow thinner every page, in proportion as we advance nearer the enlightened ages, we soon learn, that there is nothing mysterious or supernatural in the case, but all proceeds from the usual propensity of mankind towards the marvellous, and though this inclination may at intervals receive a check from sense and learning; it can never be thoroughly extirpated from human nature.' (Hume, 1902, p.119) Being the supreme philosophic naturalist that he is, Hume is pointing out that even in so called enlightened times human beings are subject to the allure of tall tales and exciting prospects. We must thus always approach any piece of testimony with a degree of scepticism when it purports to tell us something 'extraordinary and marvellous'. And are we not constantly bombarded with claims about this or that currently fashionable new technology that will transform our lives? The form is always 'x revolution' were 'x' is some emerging technology.

Fourthly, and finally, the point Hume is driving at is again one of evidence: '...that there is no testimony for any [miracles], even those which have not been expressly detected, that is not opposed by an infinite number of witnesses; so that not only the miracle destroys the credit of testimony, but the testimony destroys itself' (Hume, 1902, p.121). He goes on to say that '...in matters of religion whatever is different is contrary' in other words the claims to the miraculous in systems of belief must be mutually destructive. Hume writes that: '...all prodigies of different religions are to be regarded as contrary facts, and the evidences of those prodigies, whether weak or strong, as opposite to each other' (Hume, 1902, p.122). Similarly I suggest that the logical point here is that at any one time we will have a great multitude of predictions about our technological futures. And this variety of predictions of trajectories will be overlaid by an equally rich variety of possible social and ethical futures like 'the garden of forking paths'. Indeed Stahl (2011, p.142) celebrates the idea of 'possible futures' as a means of clarifying and exploring the more desirable ones. But what we have then is contrary versions of the future which may cancel each other out.

5. Conclusion

I have tried to suggest that Hume's discussion of miracles and prophecy is applicable to social and technological forecasting. In the same way that miracles can never provide evidence for the existence of a deity (or deities) social and technological forecasting can never provide evidence of future states of the world. Hume's maxim against the possibility of miracles is equally applicable to the idea that

predictions can provide useful evidence for policy-making. Hume's key *a priori* argument must provide a powerful check against beliefs in the efficacy of prediction. The weight of evidence is always going to be against a prediction turning out to be true. This is far from being a negative message; it is rather a liberating one. Do we need really need predictions to make (morally) good decisions? Rather must we not accept that our decisions in such matters are always 'under ignorance' and that we must act appropriately and with humility in the face of an unknown future? It seems to me that the contemporary secular world, as much as the Hume's religious eighteenth century world, is in need of his 'everlasting check to all kinds of superstitious delusion'.

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ETHICAL ASSESSMENT OF GUARDIAN ANGELS TECHNOLOGY SCENARIOS

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Abstract

In this paper we present the feedback that we have gathered to Guardian Angles scenarios from application field experts, from consumers and from ethics experts. Feedback was gathered from application field experts at VTT with individual interviews and focus groups. Feedback from consumers was gathered on the Web, using VTT's Open Web Lab. In addition, Senarclens gathered feedback from four different student groups. Also 11 experts on different fields of ethics assessed the scenarios. In this paper we present the results of these three activities.

The application field experts helped us to identify most potential usage potentials and they also proposed several new application possibilities. The initial feedback from consumers towards GA technology was very positive. GA technology was seen as an empowering tool to add people's possibilities to monitor their health, wellbeing and environment. People could see usage possibilities in their own lives especially for health and well-being applications as well as in GAs embedded in consumer products. However, concerns were raised especially regarding access to information, digital division and overall whether the society would be working better without too much technology, knowledge and measurements. The ethics experts gave lots of valuable feedback to GA technology in general as well as to the scenarios. The ethics experts identified numerous issues that should be studied in more details before going to the real-life experiments: privacy issues of course are the most obvious but also issues related to the autonomy, user control, freedom, medicalization and human existence were raised up. Some less obvious issues are also accessibility, affordability and accountability: will these solutions be available for those who could need them or are these only for elite and who will be responsible if these solutions do not work? The technology can lead to infantilisation and patronising of people, and medicalization is not always a good thing. Trade-offs need to be considered in security solutions as security often limits liberty. Once an information resource exists, there are multiple interest groups that may have interest to exploit the data. Thus measuring and storing data needs to be assessed in a wide scale.

Keywords

Ethical Assessment, Scenarios, Future Emerging Technologies, Human-Driven Design

1. Introduction

Guardian Angels technology will enable very small size sensor and computing units to monitor the well-being of us and our environment. The Guardian Angels units will be self-sufficient with energy, and thus suitable for long term use without maintenance. Several usage possibilities are foreseen in health, well-being, safety, sustainability and empathic user interfaces. (Guardian Angels 2012)

This paper introduces a collection of future visions of different possibilities to utilise Guardian Angels technology. The visions are based on scenarios gathered from Guardian Angels partners in a web survey and via email. In this paper we describe the most potential application fields for Guardian Angels technology and describe some promising usage possibilities for each field in the form of usage scenarios. The following application fields have been identified: health, well-being, support for the elderly, extending human abilities, empathic human-technology interaction, safety, traffic and green solutions. (Guardian Angels 2012)

Physical Guardian Angels have a lot of usage possibilities in health and well-being. The small size and energy-efficient solutions provided by Guardian Angels technology facilitates versatile and long

term monitoring, thus giving more insight to the status of the user and the trends. In many cases emotional Guardian Angels provide additional information of the status of the patient. Another wide application area is safety. Guardian Angels solutions enable early warnings of possible hazards, thus leaving time to prepare. Some of the safety related applications are based on monitoring the emotions of people in a crowd. These scenarios may be both technically and ethically doubtful. (Guardian Angels 2012)

In human-technology interaction, Guardian Angels technology may enable empathic user interfaces that adapt according to the emotional status of the user. These kinds of systems are currently studied quite a lot but the lack of easy wearable sensors systems has prevented wider implementations and trials. (Guardian Angels 2012)

We have discussed the visions and scenarios with experts and potential users of the identified application fields to further improve our vision of the future possibilities of Guardian Angels technology. This paper shares outcome from those discussions and the organisation of this kind of assessment procedure for the FET (Future Emerging Technologies) -project.

2. Ethical assessment of future technologies

Ethical challenges of future technologies are multifaceted, almost infinite when considering different possible contexts and stakeholders and in many cases also quite hard to predict and vision more concretely. The technology should be safe and secure as such, the applications should be safe and secure, and human values such as privacy, autonomy, trust etc. should not be violated by the technology or the applications. These ethical issues have been frequently raised as important factors in user requirement definition process. (e.g. Kosta et al., 2008, Rotter, 2008) but ethics has also reached much more visibility as a more important general view to the research and innovation (e.g. Stahl et al. 2010, Wakanuma et al. 2011).

One of key element of our design approach is to take into account ethical issues in our project – as much as it is possible. We have also built up ethical guidelines and ethics by design approach for designing of various applications and services in our daily project work. (e.g. Topo et al. 2004, Ikonen et al 2006, Kaasinen et al. 2013) Our latest attempt to build up concrete guidance on ethical issues was in MINAmI project. There our focus was to take into account ethical perspective when designing applications and services that utilise MINAmI platform for mobile-centric Ambient Intelligence. The guidelines also cover issues related to implementing the MINAmI platform itself. The aim of the guidelines is to motivate and influence all who are involved in the design and utilisation of mobile-centric ambient intelligence technologies, applications and services. Those guidelines were based on earlier research, on the ethical assessment of MINAmI scenarios, on the user evaluation of the scenarios, on feedback from two workshops with ethics experts, as well as on comments and contributions from the Ethical Advisory Board of the MINAmI project. (Ikonen et al. 2009)

The guidelines are divided to impact on design solutions: what kinds of solutions are

ethically acceptable and impact on design process: how to design ethically acceptable

solutions. Impact of ethical principles on design solutions is analysed on two levels: 1) general technical features of mobile AmI and impact of ethical principles on them and 2) impact of ethical principles on application field specific features of mobile AmI. In the latter the focus is on MINAmI-specific application fields: health care, assistive technology, housing and everyday life. During different phases of the technology design process, required ethical considerations are different. The perspectives of different stakeholders should also be taken into account. A holistic perspective is required to consider the challenges, threats and opportunities in advance when designing new technologies for our future everyday environments. (Ikonen et al 2009)

Ethical guidelines were built on six ethical principles that are selected based on the ethical assessment of MINAmI scenarios (Ikonen et al 2009):

Privacy: An individual shall be able to control access to his/her personal information and to protect his/her own space.

Autonomy: An individual has the right to decide how and to what purposes (s)he is using technology.

Integrity and dignity: Individuals shall be respected and technical solutions shall not violate their dignity as human beings.

Reliability: Technical solutions shall be sufficiently reliable for the purposes that they are being used for. Technology shall not threat user's physical or mental health.

E-inclusion: Services should be accessible to all user groups despite of their physical or mental deficiencies.

Benefit for the society: The society shall make use of the technology so that it increases the quality of life and does not cause harm to anyone.

We also proposed a preliminary procedure for ethical assessment in early concept development phase in Minami project. In GA we are utilising our previous experiences and taken steps further on to build up more comprehensive governance model for responsible research and innovation of future emerging technologies. (Ikonen & Kaasinen 2008)

3. Guardian Angels

The "Guardian Angels for a Smarter Life" (GA) FET Flagship project will create intelligent autonomous electronic personal companions that will assist us from infancy to old age. These devices will be private and secure systems featuring sensing, computation, and communication beyond human capabilities. There will be three families of GA devices, all based on the concept of a smarter life: a lifestyle that benefits from the instant availability of relevant information, whether that information comes from within our own bodies (heart rate, insulin level, the amount of stress we feel, our attention or distraction levels) or outside them (pollutants, pollen, obstacles in our way). The three GA families: (1) **Physical GAs**, which can give us information about our physical and physiological status, for purposes including health care, rehabilitation, or sports. If we choose, the information will be communicated securely with doctors or others in our sphere of health care providers. These devices, with their strong focus on disease prevention and early diagnoses, will help keep healthcare affordable and accessible to all. (2) **Environmental GAs** will focus their sensing on environmental conditions, serving as a sort of 6th sense to allow us to know what is in the air around us. For visually impaired people, they could help fill in visual information by "seeing" for them. In combination with the Physical GAs, it will be possible to correlate our physical state with the environmental context. (3) **Emotional GAs** will be able to perceive emotional or affective conditions such as stress or attention level, so that we become more self-aware in situations where it can work to our advantage, whether we are driving a car or are in a learning environment. (Guardian Angels 2012)

Security and privacy are top priorities in the GA project. The data gathered will be yours; it will always be your decision to keep or to share it. In addition, the ethical aspects of GA applications will be assessed from the beginning of the project, through interactions between researchers, an ethics board of experts, and end users. (Guardian Angels 2012)

4. Feedback to Guardian Angles scenarios

Feedback was gathered from application field experts at VTT with individual interviews and focus groups. Feedback from consumers was gathered on the Web, using VTT's Open Web Lab. Senarclens gathered feedback from four different student groups in face-to-face meetings. In addition, 11 experts on different fields of ethics assessed the scenarios.

4.1 Feedback from application field experts at VTT

We organised 3 different Expert groups and additional individual interviews. Here we present as an example the results from Ambient Intelligence group. Feedback from other discussions is summarised as general feedback to scenarios.

Expert group of Ambient Intelligence

We organised a 1 hour focus group in Oulu, Finland in 4th of January 2012. Totally 10 researchers who were members of VTT's Open Smart Space researcher network participated. The participants were experts of ambient intelligence and ubiquitous computing. The scenarios were presented to them as a slide set and then they were asked to assess in pairs the following questions:

- Do you see some other application areas than the ones presented?

- Which of the presented applications you consider credible? Why?

- Which applications are not credible? Why?

- Can you see some other application possibilities?

Additional application fields

The following new applications fields were proposed:

- Home – monitoring moisture, toxins, allergens

- Retail – there is a need to monitor the clients: how they move, what items they study, identifying unwanted behaviour. Also guiding the behaviour of the clients.

- Predicting catastrophes and crisis situations (partly included in security scenarios)

Figure 1. Guardian Angels are smart, autonomous systems that are beyond wireless sensor networks in terms of functionality and powering, and include a higher complexity than the simple sensor nodes foreseen today for the internet of things.

Feedback to scenarios

Safety and health related as well as life cycle management scenarios were seen most credible. Most doubtful scenarios were black box of body and all scenarios including emotion measurements. The participants raised privacy as a crucial issue with emotion monitoring. They were wondering if people could sense the emotions of other people. Extending human senses was pointed as the most interesting application field. However, the participants were wondering how the extended senses should be coupled to human's existing senses. The participants commented that many scenarios are already reality at least in research but GA will bring additional value with small size and energy efficiency.

Health and user interaction scenarios were considered bold. Safety and life cycle scenarios from many parts were claimed to be existing technology. Sustainability of the GA solutions was also questioned – even if they a cheap they cost and may have environmental effects.

4.2 Feedback from consumers (VTT open web lab study)

Purpose of the study

The main purpose of the study was to open a conversation channel where GA visions could be introduced and consumers could give their feedback and express their ideas and opinions regarding the topic in the early phase of the project. The study aimed at gaining understanding of the users' expectations, concerns and fears towards GA technology, and getting insight which application fields seem to be most useful, doubtful or interesting based on web conversations.

Method

Consumer feedback was gathered in VTT Owela (http://owela.vtt.fi/), which is an open web laboratory for user-driven innovation and co-design. Owela supports active user involvement in the innovation process from the first ideas to piloting and actual use. Owela has over 1000 registered users who represent society at large. In this study Owela was used for gaining user feedback and insights on different GA visions and scenarios. Registered Owela users were invited to discuss and comment seven GA application fields. The topics were related to GA technology in general, health, well-being, wellbeing of loved ones, measuring emotions, safety and consumer products. Besides commenting the topics, users were asked to evaluate the potentiality of ideas with a simple poll and ideate on other ways of usage for GA technology. The study was open in Owela tool for two weeks: 11.1.2012-25.1.2012. The content of user comments was analysed qualitatively.

Each conversation topic included a short one or two chapter description of the vision, a couple of open questions to encourage discussion and a poll with three options to evaluate the topic. In the poll the users were asked whether they find the topic useful, doubtful or whether they could use the technology in the described way themselves.

Participants

Study participants were recruited by sending an invitation email to participants of previous Owela studies (for those who have allowed storing their contact information in a user register and contacting them when new studies are starting). After one week response time, the users were sent a reminder email to encourage them to participate in conversations, create own ideas and respond to the polls. In total, 110 persons registered to participate in the study. 54 persons participated in the conversations and around 30 people (27-34 depending on the topic) took part in the polls. The participants represented different age groups and were almost equally males and females.

Findings

GA technology raised lively discussion and evoked both enthusiasm and concerns. The most active conversation topic was health, gaining more than sixty comments. All the other application areas raised a lot of discussion as well, gathering 40-49 comments. Participants had a rather positive view towards different application areas. With the exception of one area, all the use cases were seen useful and not very doubtful. The exception case was emotions; measuring emotions was an area which had reversed responses. It wasn't seen very useful and over 70 per cents of respondents considered it doubtful. Health, well-being and consumer products were the areas which participants saw most potential for using the devices themselves.

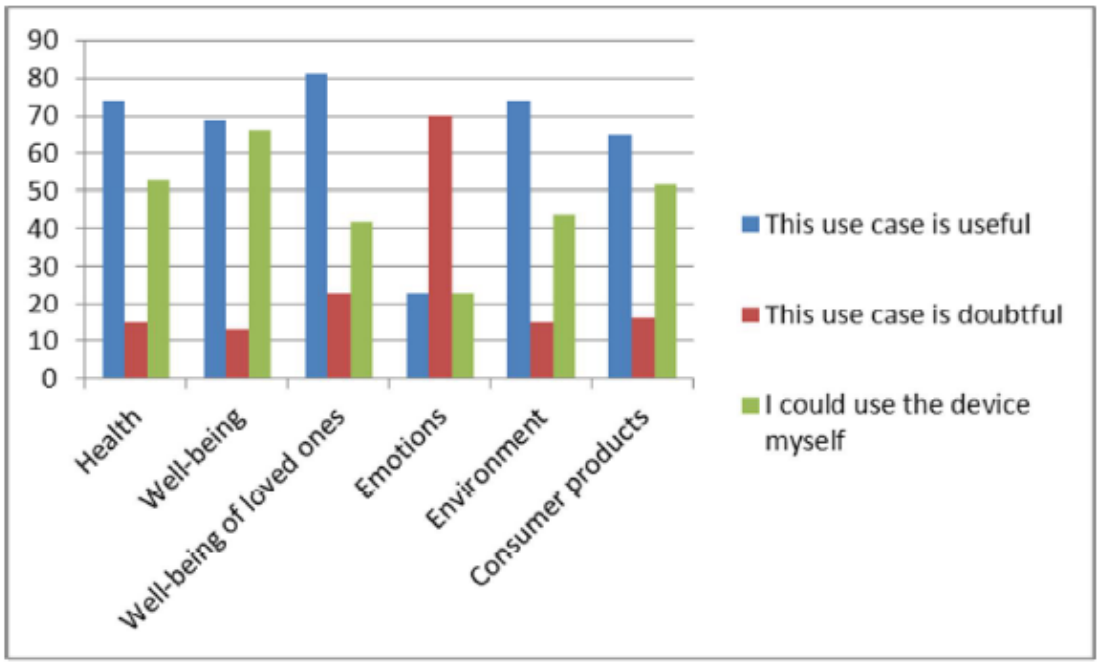

Figure 2. Poll results

Besides commenting use cases, participants proposed novel ideas for using the technology. 16 ideas were posted to an idea section, and they also raised discussion between the writer and other participants (most of them gained 5-15 comments or additional ideas). The study seemed to raise participants' interest in nanotechnology in general; they did not only get more information about it, but some searched for new information themselves. One participant even posted a link to an international nanotechnology report.

Summary feedback from Owela study

GA technology was regarded as an interesting conversation topic, creating both optimism and concerns. Some of the participants emphasised that these solutions have been expected to come to market for years and would make a significant enhancement especially in health care. On the other hand, many of the participants found the technology doubtful and were concerned of the technology gaining too much control of our lives. This might reflect in the threat of misuse of information, lack of health care personnel, missing social contacts and stress caused by constant measurements.

GA technology could be seen as an empowering tool to add people's possibilities to monitor their health, wellbeing and environment. However, the increasing power also creates concerns – whether the power is given for right people, whether some are excluded without their will, whether some are included without their will and in the end - whether the society would be working better without too much technology, knowledge and measurements. Even though GA technology would be beneficial for many use cases, the extension for almost all the fields of our life seems to create concerns.

Owela participants were clearly interested in the opportunities and threats of GA technology, and the forum could be utilised also for future studies related to specific application fields, new use cases or specific target groups. It would be interesting to gather feedback and ideas for example from people suffering from chronic diseases or from people working in demanding work situations. It would also be interesting to invite the participants of this study to comment on further developed ideas or scenarios. (Heikkilä & Kaasinen 2012)

4.3 Feedback from student groups

Senarclens gathered feedback to the scenarios from four different student groups. The results are presented in the following.

Presentation and discussion with PhD students and postdocs

5 July 2011

Participants:

15 PhD students and postdocs from IBM Research, all male.

Method:

Presentation of the GA concept by Kirsten Moselund, IBM Research

Moderated Q&A and discussion

Results:

A high concern was with the security of the devices. Data security was deemed paramount and extremely difficult to achieve. The main questions in this context affected the access, the control and the use of data. "Big brother is watching you" was a main concern. Application scenarios which the participants welcomed were mainly health-related. The participants stressed that they, at the moment, did not feel the need for a GA device, but could imagine using one with weakening health. The implantation of devices, however, was declined in every stage of life.

Presentation and discussion with high school students

EPFL Lausanne

Participants:

- group of 22 high school students from Lausanne, 14 male, 8 female, aged 16-20 (17 November 2012)

- group of 17 high school students from Neuchâtel, 15 male, 2 female, aged 16-19 (15 December 2012)

Method:

- Presentation of GA technologies through lab visits and experiments

- Presentation of GA - Moderated Q&A session and discussion

- First, students were introduced to technical and scientific developments and their potential. They produced their own basic Graetzel cells and learned about the future possibilities of photovoltaic energy. They tested heart beat sensors with Bluetooth connection to their smart phones. A detailed presentation informed them about the possible ways these future technologies could be applied.

Results:

The students were extremely receptive to ultra low power technologies. Green technologies are welcome on all levels – energy efficiency, sustainability, green manufacturing / production, reduction of material consumption were some of the possible applications they mentioned. Traffic was a second field of applications they favoured. They were very positive about the benefits of GA devices in this area -

intelligent cars, engine efficiency or secure and effective transportation systems were some of the ideas they approved. They high school students fully supported the development of GA devices. However, they were very cautious when it came to collecting and transmitting data and did not trust any possible future data security solutions.

Creative workshop with scholarship students

ETH Zürich

13 December 2012

Participants:

23 scholarship students aged 19-28 years, 13 male, 10 female, different degree courses

Method:

- Creative brainstorming methods

- Presentation by Christofer Hierold

Summary:

- Only basic information on the GA devices was available at the start of the workshop, like basic functions, physical, environmental, emotional application etc.

- Then the participants gathered different inspirations and ideas on the possible target groups, possible collaborators, and application scenarios.

- In a next step, this information was made available the whole group. The task was to combine these idea snippets to form concrete application scenarios.

- Finally, they thought about the kind of device they themselves would like to benefit from.

- After the brainstorming session, Christofer Hierold explained the technological challenges of the project.

Results:

Target groups identified included scientists (social scientists, psychotherapists) who would benefit from extra information on a person's emotional data. Also, GA was seen as conducive to alternative, nonsettled, migratory lifestyles due to the flexibility and autonomy it offers. Concerning application scenarios, the students were in favour of immediate emergency calls. While augmented safety was one bonus, a big majority was also interested in behaviour monitoring, expecting positive changes in their behavioural patterns. A device they personally would like to use included exactly these features. Women seemed more concerned also with nutritional behaviour and expected better data on their food intake. Equally, a further data storage possibility seemed attractive. Again, the biggest concerns were with data security and possible negative implications of permanent traceability.

4.4. Feedback from ethics experts

We gathered feedback to the scenarios from experts of different fields of ethics. The aim of the study was to identify the most crucial ethical issues related to Guardian Angels technologies. By identifying those issues early, we can then take them into account in planning the activities of the forthcoming flagship project. Another aim was to familiarize the tentative members of our Ethics Advisory Board with Guardian Angels technology and our ideas of usage possibilities.

We asked external experts of different fields of ethics their willingness of joining the forthcoming Ethical Advisory Board (EAB) of Guardian Angels (GA) project. We also asked the experts to comment Guardian Angels White paper, which included our scenarios. 13 individuals from 11 different organisations went through the paper and commented the scenarios as well as Guardian Angels applications in general. They were also asked about their preferences and recommendations of organising the work of the EAB in the forthcoming GA project.

The task we ask them to do is described below:

We send you our Deliverable 3.1 for feedback:

"Guardian Angels White paper. Foreseen Impacts of Guardian Angels technology in

different application fields". We ask you to study the report and comment on following issues: 1) What are the most critical issues you identify in these scenarios from ethical or social perspective?

2) Do you find some obvious trade-offs/tensions between some groups/stakeholders when utilising these technologies and can you somehow justify those trade-offs when comparing opportunities/benefits and threats/ disadvantages in these scenarios from different perspectives (economical, ecological, social)?

You can assess all the proposed application fields or only those ones that you feel familiar with.

Feedback to Guardian Angels vision

We presented the vision of Guardian Angles as following:

Guardian Angels technology will enable very small size sensor and computing units to monitor the well-being of us and our environment. The Guardian Angels units will be self-sufficient with energy,

and thus suitable for long term use without maintenance. Several usage possibilities are foreseen in health, well-being, safety, sustainability and empathic user interfaces.

The wide set of scenarios will be used to further refine Guardian Angels vision and to represent it in a selected set of futuristic, scientifically valid scenarios that have high business potential and significant societal impacts. The scenarios will be discussed with experts of the selected application fields to further improve our vision of the future possibilities of Guardian Angels technology. The scenarios will also be presented to ordinary people to get their feedback and suggestions.

We have classified Guardian Angel sensor systems into three classes:

1. Physical Guardian Angels facilitate long-term monitoring of health parameters to predict and prevent health problems

2. Environmental Guardian Angels monitor the natural environment, buildings and traffic for increased safety

3. Emotional Guardian Angels are based on monitoring physical signals but the signals are analysed to identify human emotions. Emotion monitoring can be utilised in empathic technology.

Trade-offs

The experts were asked about trade-offs/tensions between different groups/stakeholders when utilising GA technologies. They were also asked if they could somehow justify those trade-offs when comparing opportunities/benefits and threats/ disadvantages in the scenarios from different perspectives (economical, ecological, social).

Conclusions

The tentative members of the Guardian Angels Ethical Advisory Board gave us thorough feedback to the vision of the project and the foreseen application possibilities. In general, from ethical point of view, the least sensitive solutions are those based on Environmental Guardian Angels and most sensitive are solutions based on Emotional Guardian Angels. The most obvious issue is privacy as Guardian Angels will enable continuous monitoring of data. Once data has been generated, issues related to access rights, protection for misuse and user control of his/her own data are raised. It is crucial that the user can turn off the monitoring whenever (s)he wants. Regarding health and well-being applications, an important ethical issue is whether knowledge, e.g. about early symptoms of diseases really improves the quality of life. People may get addicted to monitoring wellbeing parameters. Implanted devices are a very sensitive issue. These solutions will require informed consent and the dignity and autonomy of the user must be protected. It is crucial that the users themselves are involved in the design of the systems; already in the very initial stages and that the opinions and concerns of potential users are taken into account. Physical

Guardian Angels can be used to extend human performance above normal. Is that acceptable and in which conditions? Empathic technology that adapts to the user's emotions may hinder young people from learning from the potentially negative effects that failing to control the emotions may have. Empathic technology can be used in marketing to persuade people and this raises several ethical concerns. With security systems a common ethical issue is that when security is increased, privacy and autonomy may be decreased. In security solutions, there are risks that a complex management tasks are delegated to technology alone.

The ethics experts stressed that there is already a good collection of research, recommendations and public opinions that could be utilised in ethical assessment. EGE (European Group on Ethics in Science and New Technologies) has published opinions about implants and ICT in general. (i.e. Opinion n°20 - 16/03/2005 - Ethical aspects of ICT Implants in the Human Body and Opinion n°26 - 22/02/2012 - Ethics of information and communication technologies). Also research projects have interesting results that can be applied in this field (ethics of ICT). However as world in general, people and especially technology and it's applications change quite rapidly there has to be continuous debate on these issues (i.e. impact on society) in all levels of society.

On project level it means strong emphasis on discussing all these issues and building up tools for empowering different stakeholders to be involved to this discussion by various means. Governance of societal issues in this kind of project has to be prioritised but it also needs to be enabled and

accomplished through the project and also for the wider audience. Guardian Angels technology and applications have been introduced in the scenarios in a very positive way and inevitably they have potential to benefit society also in global level. However, there are lots of threats and weaknesses that should be taken into account from the very beginning when designing these technologies. The ethics experts identified numerous issues that should be studied in more details before going to the real-life experiments: privacy issues of course are the most obvious but also issues related to the autonomy, user control, freedom, medicalization and human existence were raised up. Some less obvious issues are also accessibility, affordability and accountability: will these solutions be available for those who could need them or are these only for elite and who will be responsible if these solutions do not work? The technology can lead to infantilisation and patronising of people, and medicalization is not always a good thing. Trade-offs need to be considered in security solutions as security often limits liberty. Once an information resource exists, there are multiple interest groups that may have interest to exploit the data. Thus measuring and storing data needs to be assessed in a wide scale. The descriptions of technologies and their usage in the scenarios were mentioned to be too general. As technology itself is not bad, good or neutral it has to be studied always in context: same technology can be used in a good way or in a bad way depending on who is defining good or bad. Different frameworks are needed to enable assessing the impacts of GAs in different application fields and in different contexts. More detailed scenarios are needed to study more deeply different perspectives from various angles: the same application may benefit one person or a group and have negative effects to the other ones. Besides more detailed scenarios and scenario analysis of course more detailed experiments and real-life studies should be conducted for same purposes: developers, designers, users and all the other possible stakeholders should be involved and informed about potential of these technologies – good or bad. Potential users need to be involved in the studies but also technology developers need to participate in considering ethical application of the new technologies.

5. Conclusions

We have gathered feedback to Guardian Angles scenarios from application field experts, from consumers and from ethics experts. The application field experts helped us to identify most potential usage potentials and they also proposed several new application possibilities. The initial feedback from consumers towards GA technology was very positive. GA technology was seen as an empowering tool to add people's possibilities to monitor their health, wellbeing and environment. People could see usage possibilities in their own lives especially for health and well-being applications as well as in Gas embedded in consumer products. However, concerns were raised especially regarding access to information, digital division and overall whether the society would be working better without too much technology, knowledge and measurements. The ethics experts gave lots of valuable feedback to GA technology in general as well as to the scenarios. The ethics experts identified numerous issues that should be studied in more details before going to the real-life experiments: privacy issues of course are the most obvious but also issues related to the autonomy, user control, freedom, medicalization and human existence were raised up. Some less obvious issues are also accessibility, affordability and accountability: will these solutions be available for those who could need them or are these only for elite and who will be responsible if these solutions do not work? The technology can lead to infantilisation and patronising of people, and medicalization is not always a good thing. Trade-offs need to be considered in security solutions as security often limits liberty. Once an information resource exists, there are multiple interest groups that may have interest to exploit the data. Thus measuring and storing data needs to be assessed in a wide scale.

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A MULTIMEDIA LEARNING TOOL TO DEVELOP ETHICAL AWARENESS

Suzy Jagger

Abstract

This paper discusses a project funded by the UK's Higher Education Academy and undertaken this year (August 2012-August 2013), which involves the design of a pedagogic framework and accompanying web-based game to support and develop ethical decision-making skills in professional business and IT contexts. The project involves the creation of scenarios, designed by undergraduate students on a third year business ethics module, as they identify and evaluate ethical issues from the perspective of different stakeholders and determine possible outcomes. The scenarios will form the content for an interactive computer game, which will depict resulting outcomes using animation. The tool will provide a resource for teaching Business Ethics at undergraduate and postgraduate level, with capability for continual development. The paper discusses the evolution of online teaching methods and the increasing relevance of computer games as a teaching tool. It discusses issues in the project milestones from initiation to final stages and, if available, will include a demonstration of the prototype.

Keywords

Teaching Ethics, Professional Ethics, Games-based learning, Moral Sensitivity, Online Learning, Teaching Business Ethics, Business Ethics

1. Introduction

As teachers and lecturers in Higher Education, we will all have noticed that a fundamental shift has taken place over the last decade in terms of the way students think, interact and communicate. The computer is no longer seen as just a word processor or number cruncher to help people to improve or convey their intellect, it is now seen by many as an extension of themselves – often of their physical presence. People now have 'relationships' with their computers – they look to it when bored, lonely or curious. They know it is 'just a machine' but it is a way to connect with others on their own terms. As Sherry Turkle describes it, 'computers don't just do things for us, they do things to us, including our ways of thinking about ourselves and other people…. People explicitly turn to computers for experiences that they hope will change their ways of thinking or will affect their social and emotional lives' (Turkle, 1995 p.26). This new form of interaction is not 'rules-driven' – it involves a space where people explore and tinker to uncover new worlds and possibilities. Young people now develop their identities from multiple influencers – some traditional in the form of family and friends, but many via navigation through online space.

Whether one considers this social phenomenon a good or a bad thing the fact remains that this connectedness will continue and become increasingly more pronounced as those born into this new culture of simulation - typically referred to as 'Millennial' students – those born after 1982 (Dede, 2005) - reach the age of maturity and attend our universities. As educators we have an opportunity to adapt to this new connected approach and utilise it positively to ensure we remain (or perhaps get) in touch with our students and their methods for thinking, interacting and learning. For those of us who are not digital natives this can seem a daunting task requiring us to reflect on the way we teach to embrace methods of learning, which utilise media more familiar to our students than perhaps to us. That is not to say the old style methods of 'chalk (or felt-tip) and talk' are not just as engaging and effective if used correctly. There is little that could replace the field trip, the guest expert lecturer, the non-academic text, and the competitive classroom debate to spark interest and curiosity. But it is to say that developing online methods of teaching at the very least could be an adjunct rather than a disruption to existing methods to help ensure a more holistic approach in meeting student needs. Indeed this is the learning and teaching trend, the 'flipped classroom'; the online course; the utilisation

of social media to communicate and relate to students. In 2005 Professor Chris Dede of Harvard's Graduate School of Education discusses the new learning styles of millennial students and reflects that 'the mission and structure of higher education might alter due to the effect on civilisation of these new interactive media' – my view is this is indeed occurring in the UK fuelled by economic developments (ibid p.7).

In his book Grown-Up Digital, Tapscott makes the argument that the net-generation of students are no longer content to sit back and just listen to a teacher expound on a topic (2009 p.134). Fuelled by their experiences online, the new millennial student expects to talk back and have a conversation. 'Smart but impatient' – they reject didactic lectures in which the teacher is represented as the fount of all knowledge – a role now allocated to the Internet - and this has changed the teacher-student dynamic. Teaching this type of student is less about providing content and more about guiding in ways to discover for themselves – to 'seek, sieve and synthesise' rather than rely on one source such as a text book, TV programme or lecture note (Dede, 2005 p.7). However access to too much information carries with it new dangers, which need mediation to ensure students are more equipped to navigate the resources without experiencing cognitive overload and ineffective use of them. It stands to reason that technology alone will not bring about quality learning and creative development.

2. Computer Games in Teaching

To accommodate these new learning styles, one area gaining momentum amongst teachers is the use of computer games to interest and engage students. This development has been encouraged by the increases seen in the use of computer games in general – increases largely fuelled by advances in the commercial computer game industry such as the rise of the Nintendo DS and Wii platforms and the development of games on diverse platforms such as online and mobile (Klopfer, Osterweil, & Salen, 2009); and software development which makes it now far easier for anyone to design and build their own game. Between 2008 and 2011 the number of gamers in the US rose 241% (56 million to 135 million) (Macchiarella, 2012). This new audience provides greater potential for the reach of educational games as technology expands conceptual possibilities. Computer games are no longer seen as the domain of geeky teenagers, holed up in their bedrooms and cut off from everyday life and are no longer limited to the 'power game', which requires hours of play and total immersion. The easy availability and increasingly affordable costs of these new types of games (often free) means they are now being used across new markets: from small, free applications for all age groups; for schools, libraries, and museums; to advanced virtual reality packages for business training programmes.

There are numerous examples of educational games. 'River City', is an example of an online multiple-user, virtual reality environment. Students are transported back to 19th Century America where they experience a virtual town and achieve a number of tasks such as taking water samples to examine the effects on pollution, or measuring population density (Dede, 2005). Other examples include alternate reality games whereby users take part in both online and real world environments, typically blending on-line interactive fiction with social networking communities (Brackin, 2000). In fact there is growing research evidence supporting the use of digital games for learning at all levels (Afari, Aldridge, Fraser, & Khine, 2013; Annetta, Meng-Tzu Cheng, & Holmes, 2010; Whitton, 2012).

Past and Current research on the pedagogic impact of computer games in education focus on a number of areas:

Microworlds and simulations use virtual reality to allow users to construct their own realities based on choices they make and from these choices they gain an understanding of the consequences of different actions. This builds on Piaget's constructivist approach whereby people learn through the building of mental constructs related to past and present experiences and are required to be active participants in the process. Papert coined the term 'constructionism' as an extension of Piaget's theory to support his research that children learn better when involved in constructing actual tangible products. His ground-breaking work utilised ICT in the classroom to teach maths to children using microworlds (Papert, 1991).

Based on his work with children and video games, Gee (2003) identified a number of principles for good learning which are endemic in good game design which he sorted into three categories: firstly,

empowered learners, as they experience the freedom within the structured environment of the game to make decisions and choose their own paths to follow. Environments in which they are free to fail, experiment, fashion new identities, and develop their own interpretations, at their own pace. Secondly, *problem solving*, where they are presented with tasks in increasing order of complexity, having completed the previous level, to develop scaffolding that remains within their zone of proximal development. And thirdly, *understanding*, as students work within the context of a distinct system with its own embedded characteristics and values which they are required to utilise as they choose pathways, in order to achieve the desired objectives. These principles are less likely to be experienced in traditional approaches in which students rely on, 'lectures, talking heads, or generalities' (p. 14). A number of research studies point to the benefits of blended learning to complement traditional lectures (Kiili, 2005; Tan, 2007).

The exponential increase in gamers and the dedication and commitment many show in the playing of games has led to interesting research into what makes games so captivating. Malone's (1981) work explores theories of intrinsic motivation within the context of highly motivating games to determine the characteristics of intrinsically motivated environments. Building on the work of other theorists (Berlyne, 1965; Bruner, 1965; Csikszentmihalyi, 1979; Moore & Anderson, 1969; Piaget, 1951), Malone discusses three distinct areas: challenge (which will involve goals of different levels, hidden information and randomness), fantasy (primarily intrinsic - which can cater to emotional desires and needs), and curiosity (both sensory and cognitive). He evaluates theorists' views on motivational learning and concludes that all three elements are apparent in well-designed games. His suggested framework for the development of intrinsically motivated learning environments is a useful companion when creating educational games.

Related to motivational learning is the importance of affective learning in which the learner experiences a level of emotional attachment to the subject or task. The importance of the affective in learning is often underplayed and yet there is evidence to show that when students are stimulated emotionally, particularly in the teaching of ethics, a higher level of learning takes place (Jagger, 2013). The studies of Bredemeier and Greenblat (1981) show levels of attitudinal change to support the view that, for certain students, computer game simulations are more effective than traditional methods in changing attitudes towards the topic and its purpose.

Reiber's (2005) research with physics students identified the importance of the instructor to ensure students reflect on what activities are taking place in the game. He noted that some students became fixated on the score and this had a negative impact on their understanding, 'due to this, they did not engage in reflection of their learning of physics. Experience without reflection is detrimental to learning. When engaged by the researcher to talk about the game's relationship to physics, participants were able to make connections that aided their learning' (p.554). Follow-up research included short explanations embedded into the game (using both text and animation) and this led to an improvement in students' understanding of the principles of physics. In fact those students who were given graphical explanations with short text, outperformed those who had received only textual explanations. He maintains that adding the explanations throughout the simulation helped students to 'construct appropriate mental representations of the physics content' (p.556).

Another conclusion made from Rieber's research was that students benefitted from simulations in which the level of complexity progressively increased as students mastered the necessary skills and that, when a simulation builds progressively in a structured manner, textual explanations no longer become necessary. Although students showed insecurity in not having the tutorials to guide them, their test scores showed they had learned just as much as those given the tutorial.

In this work Rieber discusses the importance of structure in game design whilst at the same time acknowledging that, from a constructivist perspective, a learning environment that is more open with less direction would lead to more exploratory discovery by the user, and thus would be of greater benefit. Despite this, he contends that his research pointed very much to the need for a clear structure in game design and concludes that a balance needs to be found in providing a level of instruction whilst still ensuring exploration and discovery are key components. Thus the question as to the role of the teacher is still open to debate, 'Although explanations were embedded directly into the simulation, one would predict a teacher or more capable peer should be able to offer much richer and more

meaningful explanations than the few studied in this research. But the point deserves restating that short explanations seem to work best when offered at the right time during the simulation experience' (p.563).

3. The Project

In response to the changing economic and technological environment brought on by a worldwide recession Business School academics are rising to the challenge to find ways to teach business ethics in a way that is effective and engaging (Institute for Global Ethics UK Trust, 2011). With funding received from the UK Higher Education Academy, the aim of this project is to provide a method for teaching Business Ethics by utilising technology to engage students with real-life scenarios, presented in a 3D game. This project represents the first stage – a prototype from which further scenarios can be built. Students were and are involved at every stage – from the design of the content, through to the development of the software, and evaluation of the product. The project is halfway through completion at the time of writing.

Advocates of educational computer games purport that games help students develop conceptual skills – to explore and think for themselves as they experience through playing out roles within a virtual identity. An important component in the teaching of ethics is for the student to develop moral sensitivity – a combination of being able to identify an ethical issue, with an understanding of and empathy for the impact of one's actions on others. It seemed a natural progression to develop a game in which virtual identities explore and experience the consequences of actions taken. As I watched my son encounter serious dilemmas which required sound decisions to progress, as he navigated terrain through immersive power games such as Heavy Rain and Skyrim, it occurred to me that if we could harness this level of dedication and deep involvement to the task of learning ethics, we may be able to provide a level of experiential learning only matched by reality itself. This way of engaging students in a media they understand combined with lecturer instruction and peer discussion of their own experiences whilst playing the game, could be a motivating, engaging and therefore effective approach in the teaching of professional ethics.

One method used in teaching business ethics is to develop skills in ethical reasoning whereby students identify ethical issues associated with specific professional scenarios and weigh the options based on the perspectives of different stakeholders. The active deliberation around ethical judgements is crucial to an effective learning process - the idea being that the development of reasoning skills will ultimately have an impact on the chosen behaviour. The use of moral decision-making exercises is a rationalist approach, which encourages students to identify relevant ethical issues – an important element of moral sensitivity, which can be a foundation for moral judgment (Jagger, 2011). Utilising technology through virtual reality will aid in 'bringing the scenario to life'. As the student navigates through the game, they are presented with a number of dilemmas based on the story. The story for this pilot prototype is set within the context of a marketing manager needing to reach her target. The user's role is as the marketing manager and he/she is presented with a range of options, which require some ethical decision-making. There are also a number of challenges which get progressively more difficult as the user makes further progress through the game designed to evoke through a virtual experience, an understanding of what a real-life ethical dilemma could be like and how different decisions lead to different outcomes.

1.1 Methodology

The project utilises a design experiment methodology in that it seeks not just to develop a pedagogic approach to teaching Business Ethics using computer games in a way that 'works' but with the intention of contributing to theory on how to teach Business Ethics effectively. Thus the broader theoretical goal for this project is to develop a psychological model of the process by which students develop a deep understanding of ethical issues using virtual reality games within an instructional framework.

The project involves the development of a prototype utilising theoretical principles with an iterative design process whereby formative feedback received throughout the design phase informs and contributes to the design and theoretical framework. Utilisation of this methodological approach should allow for adaptation of the theory to other contexts. The project is seen as a collection of activities set within the context of an undergraduate Business Ethics module – the game being a component supported by instructor guidance, classroom tasks and peer discussions. Cobb et al refer to a combination of activities as the *learning ecology* - 'designed contexts are conceptualised as interacting systems rather than as either a collection of activities or a list of separate factors that influence learning' (2003 p.9). Thus the computer game is not to be seen as an ethics teaching tool to be used in isolation from the other activities. The strength of this methodology is the iterative process which leads to continual improvement – as Cobb et al comment; 'In contrast to most research methodologies, the theoretical products of design experiments have the potential for rapid pay-off because they are filtered in advance for instrumental effect. They also speak directly to the types of problems that practitioners address in the course of their work (Ibid p. 11).

1.2 Current Progress

As mentioned earlier, the project is in the middle of development. A storyline for the game has been created and developed in collaboration with two student software designers and three experts – two staff members, one involved in research in serious games and game programming; the other conversant in 3D design environments and myself as designer of the pedagogic content. After developing the storyline and creating the script, building of the prototype has begun and version 1 will be presented in June at 2 events: an HEA funded dedicated event at Roehampton and the ETHICOMP conference in Denmark. From these events feedback and comments will be collected to aid in further development after which version 2 will be uploaded and presented to the incoming ethics class for analysis in September. This will involve researchers evaluating patterns of how students think about ethics and relate their thinking to how this was supported and organised by the teaching intervention. Research from this session will be used in development of version 3 for upload to the website.

A number of issues have already presented themselves during the design process.

Story Creation

A key requirement and indeed a valuable component of the project was the use of students in the design and development of the storyline and the software. To facilitate this, for their first assignment, working in groups, management students in the Business Ethics class were required to write their own stories about a work-based ethical dilemma either they, or friends/family had experienced.

The task created a lot of discussion amongst them as they shared their experiences with each other about what dilemmas they thought represented ethical issues. Interestingly, I had thought they would find this assessment quite simple, as it did not require any deep theoretical expertise but was more a reflection on practice and yet a number of them were completely thrown by it – having had what they described as little or no experience in writing a story. This was in itself enlightening – it concerned me that teaching using the standard essay and report based on theoretical knowledge as the method for assessment has resulted in students who are flummoxed when asked to create something original, from themselves. However, after a great deal of support and encouragement, the resulting stories proved to be very worthwhile for me as an educator and hopefully worthwhile for students in developing a personal understanding of ethics – formal feedback from them is currently being analysed. From my perspective, it led to a deeper knowledge about the experiences of these individuals, and who they are – which enabled me to relate more directly to them when discussing deeper ethical concepts. So although initially an assessment designed to help students develop a deeper understanding of personal ethics as well as provide content for the game storyline, it had the added benefit of helping the lecturer gain a deeper appreciation for the experiences of the students.

In terms of the software, the timing of the assessment made it impossible to incorporate one of the stories into the game and so six of the stories have been included in the website as additional teaching material for dilemma analysis purposes and future software versions.

Technological Issues

The issue of which software to use required more research than initially anticipated. This was because between the time of writing the funding proposal, and the start of the project (which was only a space of six months) technology in the design of 3D games had improved considerably and so we changed the software choice for a new, open source solution. This created an issue for the student developer who was required to now learn a new software product – a steep learning curve. However, due to the vast improvement in functionality combined with less cost, it was felt the decision to change was justified.

Re-evaluation of the project timeline was required not just because of the change in software but also because I was unprepared for the work ethic of many students who leave all to the last minute. In the future, it will be necessary to allocate specific, detailed milestone deadlines throughout the year to ensure the project remains on schedule. This is of course a project management issue and has made me question whether it is feasible to utilise a third year undergraduate for such a task even if it is part of a dissertation. However it may be just that I misjudged the capabilities of the student to adjust to new software. In any case, the back-up plan in the form of professional developers will come into operation if necessary, to ensure the initial prototype deliverable should be available by 1st August. Due to the iterative nature of the design, further development will be occurring throughout the autumn term after feedback from the new ethics class.

4. Conclusion

An essential component in the teaching of professional ethics is the development of moral sensitivity. For students to see for themselves the importance of operating within and being true to one's personal values. This often requires reflection on what those values are or would be within the context of a dilemma within the workplace - to see the impacts of decisions they may have to make in the course of their working life and how those decisions impact on others. We cannot create real-life situations to develop experiential learning, but we can do the next best thing - we can utilise technology to help bring about a virtual learning environment using media and interactive elements to challenge, engage and motivate, where users are free to act, experiment and explore as they choose their own decision paths and reflect on possible consequences that result from the ethical choices they make. From this virtual experience, we can create a talking point for class discussions and theoretical analysis. It is hoped that this prototype is just the beginning in the development of a series of game stories, which will span different ethical situations and disciplines, as useful components within a broader pedagogic framework of instruction.

If you are interested in knowing more about this project or wish to be involved in some way, please contact s.jagger@roehampton.ac.uk

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THE ETHICS OF USER EXPERIENCE DESIGN DISCUSSED BY THE TERMS OF APATHY, SYMPATHY, AND EMPATHY

Thessa Jensen and Peter Vistisen

Abstract

This article is a proposition to discuss user experience design in the light of ethical implications depending on how the designer regards the user both during the design process and the intended use of the design once it is finished. There has been a lack of discussions surrounding the ethical dimensions of creating and maintaining an empathic point-of-view on the users, and the responsibility the designer thus holds for the users experience with a given system. This article will define the empathetic dimensions of user experience design by discussing its counterparts: apathy and sympathy, and the difficulties of avoiding these points-of-views in the user-centred design process. Exemplifying the differences and ethical implications for the designer in the interaction with the user through the design of interactive digital systems.

The article does not offer solutions, but poses questions on how ethics, designer, and users can interact through and influence on the design and the design process, and thus hopes to initiate a discourse in which the importance of ethical stance the designer takes in the design process is acknowledged.

Keyword

user experience design, design ethics, Løgstrup, empathy, sympathy, apathy

1. The Importance of a Design Ethic

"It is simply not acceptable to take the attitude that, 'I just make the tools. I can't be responsible for how they are used. … The reality is, the design can have a huge impact on channeling usage along certain paths. Those of us who design such things need to make the best efforts to make sure that those paths conform to our ethical compass. Of course, that implies that we have to have some sense of what our values are." (Bill Buxton 2007)

Design is important especially when digital interactive media are involved. Given the specific nature of material involved in designing digital media as 'the material without qualities' (Lowgreen & Stolterman 2006), and namely its total lack of boundaries and form, but having infinite possibilities of content, the first aim of the designer is to create the boundaries by defining the design problem, give it form, and adjust it to fit the intended content. Furthermore, the movement towards a user-centred design approach, pioneered in the 80's and 90's by designers and scholars such as Suchman (1987), Greenbaum & Kyng (1991), and Bannon & Bødker (1989) has emphasised the iterative process, the dialog with- and observation of the user, and the problem-oriented approach to the design process as a core aspect of creating the best possible future scenario for the user.

In recent years a lot of design discourse has added the concept of empathy as a central aspect to how the designers within the user-centred design process established a deep understanding of the users, and thus informing what the optimal user experience should be (Merholz et al 2008, Kolko 2012). It can be said that empathy is a core interest for contemporary explorations of user centred design, and experience design. Yet, few designers stop to discuss what values and ethical demands such an approach to design entails. As Buxton points out in the above citation, it is most important for the designer to be aware of his own values when designing. This points towards Kranzberg's first law of technology, which is "neither good nor bad; nor is it neutral" (Kranzberg 1986). If the designer sees his design as user centred or experience design, he has to choose an ethical approach which enables him to see the user as the end and not the means of the design and the design process.

In other words, when the designer claims to be user-centred or to be designing the context of the user experience he also implicitly commits to shape and form certain aspects of the experience for a group of human beings, and thereby also adopting the responsibility for these experiences, and their

consequences. This experience can both be a small flutter in the user's way of performing a simple task, enhanced by a given design, or it can be a life changing experience, brought about by an all-encompassing design strategy which catapults the user out of his everyday life (Hassenzahl & Tractinsky 2006).

Thus, the three main concepts of this problem space are; the designer, the user, and the experience. In this, the relationship between the user and the designer is the fulcrum of the design process and the subsequent design. Because of established responsibility for the designer towards how to frame the experience for the user it follows that taking responsibility involves taking an ethical stance towards both the user, the experience, and the design itself, since the design will affect the way the user perceives the world around him.

The common denominator being the relationship between designer and user, we choose to look at the problem posed in this paper from the ethical theory described as 'the ethics of the Other' as it is found in Løgstrup's works on ethics (Løgstrup 1997) and to centre the discussing around the user-centred design concept of empathy, and its counterparts sympathy and apathy.

2. The Ethical Demand

"No one is more thoughtless than he who makes a point of applying and realising once-delivered directives. His claiming that the directives are radical really makes no difference. Thinking and imagination become equally superfluous. Everything can be carried out quite mechanically; all that is needed is a purely technical calculation. There is no trace of the thinking and imagination which are triggered only be uncertainty and doubt." (Løgstrup, 1997:114)

The Danish theologian and philosopher K. E. Løgstrup developed the idea of an ontology-based ethic in his book 'The Ethical Demand' (Den etiske fordring). The grounding of the ethical demand is found in Løgstrup's sovereign expressions of life.'

For Løgstrup the starting point of ethics is not universality or laws on morals and ethical behaviour. His starting point is the specific meeting of two people. This meeting places demands on the two people involved. The 'Other' placing an unspoken demand of trust, openness of speech, mercy, and a wordless appeal for nonviolence on the 'I'. These demands are the sovereign expressions of life and they will, according to Løgstrup, always be present when two people meet each other. The sovereign expressions of life can be seen as an undercurrent in the meeting. Even though the life expressions are present, they will never be met fully. As Løgstrup says:

"The radical demand says that we are to care for the other person in a way that best serves his interest. It says that but nothing more. What this means in a given situation a person must discover for himself in terms of his own unselfishness and in the light of his own understanding of life. This is why in the very nature of things it is impossible to obey the radical demand on the basis of motives which are foreign to the demand." (p. 58 of the 1971 English translation of The Ethical Demand)

With this Løgstrup emphasises the human being as the fulcrum for our acting. In a design perspective we could see user needs, scenarios, and user generated design as a way to centre the focus on the human being. Thus the design becomes either sympathetic or empathic.

So the radical demand is based on the actual situation, the actual people involved in it, and how the 'I' determines what is in the best interest of the 'Other'. While the radical demand is underlying the interaction between the two persons, the actual outcome is by no means given. Løgstrup does not apply rules, norms, or laws. Yet he explains, why people in general are likely to demand laws, rules, and norms:

"The social norms, on the other hand, give comparatively precise directives about what we shall do and what we shall refrain from doing. We are usually able to conform to these directives without even having to consider the other person, much less take care of his life." (ibid.)

As Løgstrup points out the person as such becomes unimportant as soon as rules and laws are applied. The same can be said of a design process, which solely looks a specifications and requirements made by the requisition or requirements found by looking at the system instead of the people in it.

Socially accepted rules makes living and interacting with people easier. People do not have to think about what would be in the best interest of the Other, since all they have to do, is follow rules. But applying the rules in the relationship turns the Other into a mean instead of being an end. Thus the 'I' does not have to recognise the Other ones needs, does not need to actually 'see' the Other as a person, as long as the rules are obeyed.

2.1 The sovereign expressions of life: life manifestations

But what are the expressions of life and when do they become visible? And how do they relate to the design of user experiences? Løgstrup talks about different expressions and is not always clear on what is an expression and what is just acting on behalf of the expression. This can be explained by the very nature of his ethics, not being rule- or norm-based, thus being heavily dependent on actual situations. These situations are also the basis for user experience design, since the design must focus on the framing of a given experience for a given user.

Life manifestations can easily be suppressed, but they will then turn into something else. According to Løgstrup, suppressed life expressions can turn into wants. Hence the ever growing wants of people can be explained by a society which suppresses life expressions.

In other words, life expressions cannot be created, but they can be nurtured. Life expressions are underlying every kind of interaction between people, but are only visible when in fact being violated, negated, or suppressed. Failing to develop life expressions during upbringing may turn the missing expressions into ever growing wants, as can be seen in western society at the time being (Pahuus 1991).

Thus, the relationship between the 'I' and the 'Other' is defined by the responsibilities the 'I' has towards the 'Other'. This notion of ethics fits our proposed responsibility for the user experience designer ('I'), who should regard the affects of his design on the user ('the Other').

3. Relationship: Sympathy, Apathy, and Empathy

How can this relationship be expanded to a framework for discussing and elaborating the relationships between designer and user? We suggest using the following three frameworks presented in the title of this paper. Løgstrup's ethics as foundation for the possible positions the design may approach the user experience with.

In short, we propose the concepts of apathy, sympathy, and empathy within the following definitions:

- Apathy is the strict adherence to a system or a procedure.
- Sympathy is the reaction to an effect.
- Empathy is the reaction to a cause.

3.1 Apathy: system over user

Designs, which puts the system before the user, are often seen in both the development and the final designs typically conducted by large institutions or governmental organisations.

The design usually takes the system itself into account, while regarding the user as someone who has to learn how to use it. The needs of the systems are not adapted to the needs of the user, who is viewed as a part of the system itself.

The user is left to his own devices, and the design does not help the user understand how it works or what is expected from the user. The user has to adapt to the system and create his own understanding.

The designer acts like the 'I' who has a given set of rules set up to ensure his actions and final design are within the boundaries of correct ethical conduct. Following these rules, regardless of the given situation or the users concerned with the final design product, relieves the designer from any

responsibilities for the actual design. The responsibility lies solely on the system itself. In this regard, the designer takes the ethical stance of apathy (Csikszentmihalyi 1997), were indifference and suppression of motivation or engagement helps distance the designer from both the stakeholders and the end-users.

This approach can be problematic since the user would have to adapt to the new design, often resulting in major changes of the way a situation is perceived.

How can the designer be held responsible if the client is approving everything? It's true that the client is historically the one deciding what functions something will have, because they assume the financial risk of failures (Krippendorf 2005). But a designer is not a mindless agent producing a product from a blueprint. There may be specifications, but the designer is the one drawing the blueprint. This is where the designer's role as an expert advisor comes into play. The client hired the designer because of his expertise in understanding how a particular medium functions. It is assumed that he has a body of knowledge that is deeper than the client's in a particular area. Thus the ethical burden is placed on the designer because the client does not have the expertise that the designer does. The client can plead ignorance but the designer cannot, and the apathetic stance therefore implies that the designer chooses to adhere to the clients requirements alone, and see the user a component in the systems as a whole.

3.2 Sympathy: giving the user what he wants

A sympathetic approach to design envelops the user and places the design responsibilities on the user. "What do you want?" is the typical question from a designer, who is sympathetic to his users. In this sense, sympathy means something akin to pity (Schauer & Merholz 2008). This maintains a distance between the designer and the user and does not necessitate understanding of the course of the problem - just the current problem setting. The design tries to take the user needs and demands into account and forcing the system to yield to the user instead of vice versa.

The designer uses the user demands as his explanation and justification for choices and rejections thus places success or failure of a given design in the hands of the user.

While Løgstrup does not cover this situation directly, he points out that it is the 'I' who has the responsibility to meet the 'Other' in every respect. Seeing the Other as the human being he is, means that the designer has to see beyond the 'Other's wants and find the actual needs. To overcome a sympathetic stance towards design is therefore also to overcome the fallacies of incomplete logic (Walton 2008) that often arises when not understanding the need of the 'Other', but looking solely at the wants. A contemporary example is the trend of the app-economy, where thinking "We want an app" is often not the actual need, but a symptom to other more important needs for the user - like for example a better restructuring of the existing IT-services to better nurture the user's needs and actions.

3.3 Empathy: giving the user what he needs

An emphatic approach to design puts responsibility for the resulting design in the hands of the designer himself. He has to take both the system and the user into account when designing. And while he does listen to the user and does undertake user-centred design, this does not entail that he gives the user what he wants. Quite contrary, the designer has to make his design decision by looking for the real problem - not what symptoms the user is pointing out.

This places far more demands on the designer than any of the other approaches, because the designer has to meet the user in the same way as Løgstrup's 'I' meets the 'Other': with respect and compassion, but without naivety. At the same time the designer has to be aware of the demands placed by the system, in which the design has to work.

The designer has to have a wider understanding of all the involved components of the design, since it is his responsibility to make the experience work. As the products and services we create become ever more complex and intertwined, he cannot possibly explore all of the contexts and situations in which the user may end up in. Even if he could, a catalog of observed behaviours is not sufficient to craft cohesive and compelling experiences. He needs to develop an intuitive understanding of the

motivations behind these behaviours. Having an empathic stance helps the designer grasp the mechanisms that drive behaviour, as opposed to just the observed external actions.

This situation is how we see the ethics of 'the Other' in action. Typically, this involves the users - not in interviews or questionnaires, but through observing and interaction. The ethnological approach to understanding both the system and the user thus gives access to 'see' the 'Other' in every respect.

4. Contribution

All three of the above are viable approaches for design. We are not judging whether one approach is better than the other. The above is a proposal for a discussion on what the designer's ethical stance and conduct entails for his responsibility for designing part of the user's experience. At the same time we would like the designer to take deliberate choices, depending on which design stance is the most appropriate in a given situation and with a given user group. A design process continues in the final design, thus a user who has been seen as a part of a bigger system will always have to fit into that system, while a user who has been handled like the end of the design will have a much greater influence on how the system has to adapt to his needs.

As designers in practice we pick and choose our battles, and throughout our different design processes a professional identity emerges. How this professional identity emerges is not as much a question of educational, technical, or economical choices, but rather an ethical issue of approaching design by the point-of-view we find suitable for our responsibility for the users experience. After all, we are all end-users of products that someone else is designing.

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A DISCUSSION OF ETHICS IN WEB BASED KNOWLEDGE MANAGEMENT

Jesper Jensen

Abstract
With the advent of the social and the semantic web our options for it- and web-mediated knowledge management have steadily become more numerous and complex. This paper seeks to present some of these options and subsequently discuss a number of related ethical questions and potential problems. The paper argues that companies and organizations must take great care when handling personal information and information about employee competency, and ensure that individual employees have extensive control over how, to what extent, and in which contexts such information is presented. The paper also argues that any use of semantically related representations of knowledge should be handled in such a way that individual employees are not dependent on semantic-web-savvy experts, but instead are given the necessary tools that can allow them to create and relate knowledge resources in ways that reflect their own understanding of the topic at hand.

Keywords
Knowledge management, privacy, the semantic web.

1. Introduction

In this interdisciplinary paper I will initially be presenting a short overview of the potential of web based knowledge management, and in particular, how semantic web technology can be used to enhance the accessibility of knowledge resources and people in possession of knowledge. The main objective of this paper is then to discuss and draw attention to a number of ethical issues in web based knowledge management. As the ethical implications of web based knowledge management are many and varied, I do not intend to cover the full pallet of issues, but instead choose to focus my attention on issues related to personal privacy. As such, I present some initial thoughts on the importance of privacy, and then move on to discuss privacy in relation to some of the new possibilities that are brought into the realm of knowledge management by the semantic web. In addition, I will also discuss some privacy related issues in web based knowledge management connected to competency mapping.

2. Knowledge management and the semantic web

Knowledge has, for some time now, been an increasingly important competitive factor for many companies, especially in the western part of the world. As such it seems only natural that companies seek new ways to develop, preserve, and share the knowledge of its employees within the company. Another predominant reason to consider knowledge management solutions is the increased geographical distance between company departments and employees.

With the emergence and constant development of the many different kinds of web based technologies, it becomes increasingly enticing to look to the web for new possibilities regarding knowledge management. Later generations of web technology allow for more advanced ways to share, combine and use data and information on the web. With web 3.0 technologies such as microformats, microdata, Linked Data standards and ontologies we can even give a computer some form of relational understanding of our data and information, which can facilitate faster, more effective, and more advanced searches as well as other automated tasks. Benefits such as these can prove quite helpful in a knowledge management context since finding relevant data, information, and knowledge can be a major challenge, especially in more expansive knowledge management systems (Bäck et al., 2003, p.270). But how well does knowledge, in its many forms, translate to the web? In the remainder of this section, I shall discuss how well certain web technologies can be used to facilitate such a translation of

knowledge. In the sections that follow, I will be discussing some of the ethical implications related to this process of translation of knowledge in web based knowledge management.

Knowledge cannot simply be defined exclusively as propositional knowledge i.e. symbolic representations (Wackerhausen, 1999, p.222). Some forms of knowledge are difficult, if not impossible, to transform directly into propositional knowledge in the shape of words and numbers. Tacit knowledge comes to mind, as does some of the hidden participatory elements of practice and communities of practice. Thus, knowledge is not always something tangible or easily described (Polanyi, 1966, p.25). The way we perceive the knowledge and skills we possess, in relation to the things we do and the context in which we do them, as well as the way said knowledge is continuously shaped in and by the social practices we are part of (Wenger, 1998; Wenger 2004), is something that might prove too complex and intangible to formalize in such a way that it can be represented in a knowledge management system or any other propositional representation. If one cannot exhaustively describe certain tacit parts of participation and interaction processes, how then will we formalize these aspects of our knowledge and input them in a propositional knowledge representation?

One could argue however, that some web 2.0 technologies, such as the wiki, might have some potential when it comes to such seemingly problematic it-mediated representations of the hidden processes or tacit elements of practice (Tazzoli et al. 2004, p.6). The reasoning behind this claim lies, at least partially, in the collaborative nature of web 2.0 technologies. Creating a web-mediated community or community of practice by using a wiki, could arguably allow not only the creation and constant modification of reificatory propositional knowledge representations, but also, at least to some extent, enable social participation in the practice that unfolds itself in the discussion area of the wiki.

Companies and organizations might have a strong interest in finding ways to formalize the knowledge of their employees, partly in an effort to keep this knowledge from leaving when an employee either finds new work or retires. And while this pursuit seems logical, though potentially difficult, it also raises a number of ethical questions that should not blindly be disregarded.

Over the course of the following sections of this paper I intend to direct my focus at identifying and discussing some of the ethical repercussions of web based knowledge management related to personal privacy. For instance, how does an attempt at formalizing the knowledge of an employee, and subsequently making it visible to co-workers and management, influence the individual employee? What are the ethical implications of such an increased level of visibility and transparency? Consequently, I intend to address the issue of whether or not such a desire to formalize, manage, and display knowledge across an organization or company risks causing altered employee behaviour, dishonesty, fear of losing face etc., potentially due to a feeling of being monitored.

Another potential ethical issue warranting further study, concerns a possible shift in or loss of control of one's own knowledge. This becomes painstakingly apparent when considering the potential of using semantic web 3.0 technologies as an interlinking component in a web-mediated knowledge management system. The use of such technologies could possibly facilitate meaningful linking and interweaving of individual knowledge representations and web-mediated communities of practice. However, since the use of semantic mark-up and the like are often handled by a limited number of experts, the semantic models of knowledge that are created risk being nothing more than an imitation of an employee's own understanding of his or her knowledge. As such, do we risk creating a distorted representation of knowledge that the employee has no direct ownership or control of? These are among the questions I wish to take a closer look at over the cause of this paper. Before I get to that however, I will start by presenting some views on why personal privacy is so important to us, as these considerations will act as a foundation for the discussion that follows.

3. The importance of privacy

Privacy as a concept is complex, and is often viewed and defined in varying ways, whether it be through the use of a spatial metaphor or through an understanding of privacy as a quantitative substance that can be diminished or eroded (Tavani, 2008, p.130). As a result, views on privacy often take into account key important elements such as non-intrusion, non-interference, and informational privacy. James Moor encapsulates these elements of privacy in his definition of privacy as an

expression of the core value of security. In this conceptual framework, privacy is not considered an intrinsic value in and of itself, but rather as a necessary condition for our ability to fulfil our need for security. According to Moor, privacy is essential because "Individuals and societies that are not secure do not flourish and do not exist for long." (Moor, 1997, p.32).

Privacy also appears to be closely connected to our social life and the social relationships we are a part of. Furthermore it often seems as if we have a sense of privacy that gives us an intuitive feeling of what is my own business (Rachels, 1975), and therefore "Simply knowing that someone knows personal information about you can feel invasive or violating." (Hartman, 2001, p.10). According to Rachels, privacy is important to us because it is "[...] necessary if we are to maintain the variety of social relationships with other people that we want to have [...]" (Rachels, 1975, p.326). Social relationships are defined by the different patterns of behaviour we choose to exercise in them. And should our ability to freely decide with whom, and to what extent, we wish to share information about ourselves be partially or fully taken away from us, we would also lose our ability to engage in social relationships in the way we want to. Thus, Rachels states that "[...] if we are to be able to control the relationships that we have with other people, we must have control over who has access to us." (Rachels, 1975, p.331). This alone, is according to Rachels "[...] one of the most important reasons why we value privacy." (Rachels, 1975, p.329).

As already mentioned, the exact nature of privacy is difficult to define, and the views on privacy are many. "Some argue that privacy can be reduced to other concepts such as property or liberty; some argue that privacy is something in its own right and that it is intrinsically valuable; yet others argue that while not intrinsically valuable, privacy is instrumental to other things that we value deeply – friendship, intimacy, and democracy." (Johnson, 2004, p70). While it is possible that privacy should not necessarily be considered an intrinsic value in and of itself, there is little doubt, that even as an instrumental value or as a necessary condition for security, autonomy, intimacy or meaningful social relations and friendship, privacy is a key ethical issue that should always be taken into account because "[...] failure to protect privacy may lead to an inability to protect personal freedom and autonomy." (Hartman, 2001, p18).

For these reasons, and others still, privacy has often been a topic for research in relation to human-computer interaction and information technology overall. In what follows I will be discussing a number of potential ethical problems in relation to the issue of privacy in web-mediated knowledge management.

4. The issue of privacy in web based knowledge management

Previously I described how the use of semantic web technology can facilitate deeper and more advanced interconnectedness between different knowledge representations and the people responsible for their creation. Similarly such technology allows for new ways of creating more accessible profiles of employee competencies. While such initiatives might create a foundation for more efficient ways of sharing information and spreading knowledge within an organisation, there are a number of serious ethical implications related to privacy that should not be overlooked.

4.1 Respecting individual autonomy when interlinking information and knowledge resources

As mentioned earlier, structuring and describing information resources and semantic data with semantic mark-up and in complex information architectures, is most often handled by information architects who are experts in the use of semantic web 3.0 technology and in structuring and categorising information and data in semantically meaningful ways. Though information architects typically make extensive use of experts in the given field of expertise for advice on how the information and data in question should be viewed, there is still a considerable possibility that the final information- or knowledge-representation will be more or less influenced and characterized by the information architects' understanding of the subject. As such there is a substantial risk that

semantic representations like these will not fully represent the understanding of the person who is responsible for the given resource and the one who actually possesses the knowledge in question.

For these exact reasons, the use of semantic representations of information- and knowledge-resources intended for web based knowledge sharing and knowledge creation, and handled by third-party experts, can be rather problematic from an ethical point of view. By limiting an individual's ability to control how the knowledge representations she has created are represented in relation to other resources in an overarching knowledge management system, we risk limiting her autonomy, and thereby limiting her ability to freely shape and define how she views and understands herself in relation to the many different social contexts and practices she is a part of.

As stated in my introductory thoughts on the subject of web based knowledge management, it seems unlikely that the use of semantic web technology alone is enough to create a working foundation for sharing and developing knowledge on the web. Key aspects of social web technology are essential in order to facilitate the social interaction and relations that are essential to human learning.

In order to respect the individual's autonomy, we should consider designing knowledge management in ways that allows individual holders of knowledge to create and semantically represent and relate information- and knowledge-resources on their own and by their own initiative. If we intend to utilize the remarkable and considerable possibilities of the semantic web in a knowledge management perspective, while still respecting personal autonomy, it would be worth investigating the possibility of developing tools that could empower individuals and communities of practice within the workplace, by allowing them to seamlessly create semantically related representations of information- and knowledge-resources, without needing to possess the expert-knowledge of an information architect.

4.2 The issue of privacy in regard to competency mapping

Thus far I have primarily directed my attention towards aspects of knowledge management that involve attempts at creating semantically related web based representations of knowledge. Now however, I intend to make a slight shift in focus, as I take a look at some of the ethical issues related to a more traditional form of knowledge management. The type of knowledge management in question could be broadly described as competency mapping. Through this approach to knowledge management companies and organisations attempt to document and highlight the competencies of individual employees. Regardless of whether such measures of competency mapping take place as an integrated part of a larger and more comprehensive semantic knowledge management system, or exists as a self-contained system exclusively designed for handling employee competency profiles, it raises several interesting and significant ethical questions, which I would like to draw some attention to.

One of the main objectives of competency mapping and other similar forms of competency-focused knowledge management is typically to create an overview of, and give insight into, which competencies are available within a company or organisation and, more specifically, where they are located. Knowledge of employee competencies can facilitate more efficient use of resources, and can provide a more informed basis for putting together working groups. Furthermore, a deeper and more detailed understanding of employee competencies can be useful when determining how to invest in training and skill development. On a different note, detailed competency profiles can also be used during wage negotiations or even as grounds for dismissal.

Another main objective of competency mapping is to facilitate easier access to employees in possession of relevant knowledge. As such, competency profiles can also be considered a tool for employees to use when searching for someone to learn certain skills from, or for someone to help with a specific task. In this light it seems relevant to touch on the use of personal information in relation to employee profiling. The relevance of personal information in relation to knowledge management in general can certainly be questioned. It does however, become a little less surprising that certain personal information might be of relevance when we also look at knowledge management, and competency mapping in particular, as a way of highlighting employee competencies and facilitating access to people. For instance, if an organisation is profiling or mapping employee competencies, it

could be relevant to include information about previous jobs and educational history. Information like this could help create a clearer picture of how the individual employee has gained some of his or her competencies. Presenting information about the fact that an employee has spent several years working in another line of business could easily be beneficial, as it might make other employees aware of an otherwise hidden resource of experience and knowledge. The use of personality tests, such as Belbin tests (see: www.belbin.com), that seek to identify personality traits and raise self-awareness, and then use this information to increase effectiveness and develop high-performing teams, is another good example of how personal information can appear in relation to knowledge management.

While making personal information and information about the competencies of individual employees easily accessible and visible to employers and co-workers may facilitate faster and easier access to relevant knowledge and people in possession of knowledge, it can also create a work environment that encourages employees to be more focused on performance and self-promotion rather than actual mastery of their given field of expertise. Furthermore, such extensive visibility and transparency might also be perceived by employees as a form of monitoring. This could have a number of negative repercussions, ranging from strategies of avoidance, where employees simply stop using the knowledge management system, for instance because they have noticed that their co-workers are no longer keeping competency profiles up-to-date, to adapted behaviour, where we no longer see "[...] their ‘‘real’’, ‘‘own’’ behaviour, but rather the behaviour the individuals think they are supposed to show." (Peissl, 2003, p.22). Thus we risk mainstreaming employee behaviour and potentially causing a substantial loss of spontaneity and creativity. This issue of "mainstreaming" is also applicable in relation to personality and competency templates that are updated either automatically or by a knowledge management coordinator, because employees are aware of what is being noticed, and thus might be inclined to act accordingly.

In continuation of this point of performance versus mastery, I would also like to draw attention to another issue that has to do with how systems for competency mapping can potentially act as negative limiters in relation to the individual employees' ability to freely and autonomously decide with whom they wish to share their personal information. By gathering personal information and information about employee competencies and subsequently making this information visible to employers and/or other co-workers, it could easily be argued that we are creating a form of directly or indirectly forced self-disclosure , potentially placing the individual employee in a highly uncomfortable dilemma. Employees might then be faced with having to choose either to truthfully disclose information about competencies or lack thereof, notwithstanding how they feel about doing so, or alternatively feel forced into either withholding information or even lying about their competencies in order not to lose face or because of fear of being sacked.

It is a core part of being human, that we live in a sort of mutual self-surrender. This self-surrender is not to be understood as disclosing every part of your being to the world and the people surrounding you. Instead it is a fundamental and vital expression of life based on trust, and expressed through a dynamic of mutual baring and response (Løgstrup, 1956). Arguably it should follow, that it is of equally vital importance, that the individual should have a basic right to decide when and how such self-surrender takes place, no matter its shape or form. Also, considering Rachels's points regarding the necessity of privacy in connection with our ability to form social relationships, the potential dangers of competency mapping are underlined even further. I would argue that if a company or an organisation wishes to gather and use personal information and information about the competencies of employees, great effort should be made to take the individual employees' rights to freely control personal information into consideration. Laura P. Hartman proposes an outline for a compromise that meets both the employer's need for information about employee competencies and the employees' need for informational autonomy. Hartman suggests the use of a "[...] monitoring program that is developed according to and guided by the mission of the firm, [...] [and] implemented in a manner that is accountable to the employees [...]" (Hartman, 2001, p.22). Hartman indicates that the needs of employees and their right to autonomy can be accommodated by giving employees access to the gathered personal information and rights to edit and keep it up to date at any time. Additionally Hartman suggests that any sort of monitoring should be designed for and directed at personal skill-development, rather than for identifying and revealing unwanted behaviour or mistakes (Hartman, 2001, p22). Even though Hartman's suggestions are not specifically targeted at knowledge

management or even competency mapping, but instead act as a general outline for handling personal information of any kind within a workplace, they still seem highly relevant from a knowledge management perspective and might provide us with a more ethical approach to web based knowledge management.

5. Concluding remarks

With the use of semantic web technology as a way of organising and visualising information- and knowledge-resources, the possibility of sharing information and knowledge within companies and organisations via the web becomes an increasingly attractive option. The prospect of being in possession of a semantically interlinked web of information resources, knowledge representations, and employee competency and personality profiles promises new and useful ways of providing employees easier access to information and knowledge that is relevant to any specific task at hand. But while the advantages seem quite apparent, there are also issues that should be considered when employing web based knowledge management. This paper has sought to draw attention to the importance of respecting individual employees' rights to freely and autonomously control how personal information, competency profiles, and knowledge-resources are presented within such a semantically interlinked knowledge management system. Subsequently this paper also suggests that tools, which allow employees to manage how personal information and knowledge resources are semantically linked to other resources, should be designed and developed so that they limit the influence information architects have on how resources and the relations between resources are represented. In addition, it is suggested that employees should be given extensive editing rights in regard to all representations of their personal information in order to preserve individual autonomy.

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CURBING THE RHETORIC: HOW WEB 2.0 FURTHER OBFUSCATES THE LEGAL LIMITS OF PROHIBITED SPEECH

Ville Kainu and Toni Värttö

Abstract

Criminal law is among the most powerful instruments in the legislators' arsenal. Criminalizing an act means that a citizen will need to critically assess their actions and consider whether there is a need for them to change their patterns of activity lest they risk criminal culpability.

Web 2.0, user generated content, and social networking sites are changing the way citizens interact. Much that was previously private has been made public, but not by the citizens themselves. Our patterns of thinking have not kept up, and consequently our behavioural patterns may put us at risk of criminal culpability.

On the other hand, protection of minorities is not only a legitimate goal of the law, but a critically important safeguard if our societies are to be ethical. This paper takes a look at how using social networking sites puts ordinary citizens at risk of committing a hate speech crime, what the legal interests and constructs in Finnish hate speech crime criminalizations are, and whether the legislation meets requirements of ethicality and clarity.

The conclusions are that a lack of clear definitions and the highly abstract legal interests mean that citizens are put to risk of criminal culpability for acts that have little, if any, causal links to actual harm, even in the form of being emotionally offended. Furthermore, the citizen is very unlikely to be able to evaluate the legality of their acts beforehand.

Keywords

Hate speech criminalization, freedom of speech, Rawls, Duff, culpability, Habermas

1. Introduction

Free speech is not absolute: public utterances are subject to criminalizations. Recent changes in communications technology have granted citizens and would-be politicians access to a much wider audience than before. As such, the opportunity to commit a hate speech crime has never been as readily available as today. The central issues in this paper are: what are the legal interests protected by "hate speech" criminalizations? How can a citizen know what is prohibited? Does the current "ate speech regime" fulfil requirements for a good law?

This paper will first take a look at Rawlsian protection of minorities, Habermasian deliberative process and a third alternative, a development on evidence-based policy presented by Kainu and Koskinen (Kainu and Koskinen, 2012).

This paper then goes briefly over recent research papers indicating that communication on social networking sites tends to disengage our critical thinking.

This analysis brings to fore the need to develop a deeper understanding of the workings and rationalizations of hate speech criminalizations. This paper attempts to detail Finnish hate speech criminalization via a model derived from Melander and Duff.

In conclusion, this paper argues that given the difficulties in even being aware of how public a social networking site is, the extreme complexity of hate speech criminalizations, it is practically impossible for a citizen to evaluate the legal consequences of their actions. Such a state is both ethically problematic and impractical.

2. Being human, rational discourse and criminalizations

2.1 Habermas and Rawls

While any act passed by the Parliament is law, something more could be demanded of legislation. We could demand, e.g., that the law should aim to maximize the utility to society, or that the law should seek to better the lot of those least well off. Kainu and Koskinen formulate a model, based on Habermas' (Habermas, 1996) and Jyrki Tala's (Tala, 2005) work, for the legislative process thus:

"First, in this concept, ethics can inform us of a desirable state towards which the society ought to be steered. Second, wide range of expertise, is to be employed to engineer a law that, according to our best knowledge, should have the least negative consequences while being effective in attaining the desirable goal. Third, after the law is implemented, social sciences must then be employed so that we know how the society has changed and why. Finally, ethics must then be applied again to evaluate the consequences as a whole."(sic) (Kainu and Koskinen, 2012)

It is not clear that Habermasian rational discourse can ever be realized when it comes to discussions regarding criminal law, as Habermas states that a necessary condition for rational discourse is that all those who would be subject to the legislation are given an opportunity to participate in the rational deliberative process that precedes legislation. (Habermas 1996) Marxist sociology, e.g., gives rise to a credible doubt that such a deliberation will to take place. While the Kainu and Koskinen model may not be as inclusive as the more theoretical veil of ignorance and rational discourse models are, it has the benefit of being actionable. Sometimes and in this paper henceforth, a similar approach is called evidence-based policy.

Rawls

It could be argued that following Rawlsian thinking to its logical conclusion would lead to a society where any expression that offends someone would be prohibited. Since the veil of ignorance prevents us from knowing whether we would be part of the disadvantaged, it would be to our advantage to protect the least advantaged (presumably we wouldn't value the expected value of being able to insult others more highly than being safe from verbal attacks).

From a Rawlsian point of departure, affording minorities special protection is not only grounded, but necessary. (Kymlicka, 1992). However, minority protection taken to an extreme disregards the value of free speech. A society without free speech is a dystopia made famous in fiction. Clearly, we cannot accept such an extreme policy implementation.

Habermas

Habermasian rational discourse would seem to lead to similar conclusion by different arguments. What would be the rational argument for allowing expressions that vilify the least well off? Would the marginalization of disadvantaged groups and the subsequent erosion of social capital be offset by the utility of less restricted public discourse?

While the empirical question must remain unsettled, it is not impossible that policies a and b, the salient difference of which is the level of protection from spirited public discourse, have equal aggregate utility after the policy has been in place for some time, if the repression of public discourse leads to less optimal policies in other policy sectors. Thus, Habermasian rational discourse would seem to direct us to weigh the costs and benefits and rationally choose a level of protection. However, actual policy setting does not exclude strategic games nor is the public discourse conducted in such a way that all legal subjects are able to understand and take part in it.

Conclusions for criminalization

While Rawlsian thinking, taken to an unrealistic extreme, offers a clear policy recommendation, the recommendation must be rejected due to the value of free speech. Habermasian rational discourse would allow citizens to select an optimal level of free speech among themselves, but rational discourse itself is nigh impossible to bring about.

Having shown that the ethical background is not clear cut, this paper will next take a look at human neurology, the Internet and how neurology affects justifiability of punishment.

2.2 Human neurology and Web 2.0

Criminal law works on the presupposition of compatibilism. That is, criminal law works on the supposition that we have a degree of free will and that there is simultaneously some determinism at work in the functioning of human mind. This could be called the common sense view of human agency. (Greene and Cohen, 2011).

The use of social networking sites is linked with a trait called low need for cognition. (Zhong, Hardin and Sun, 2011) This, taken with the fact that humans in general have an aversion for using the critical thought processes (Vihriälä, 2012) seems to point at a conclusion that human beings are not very likely to operate with much critical thought and self-reflection on social networking sites.

These sites are created to foster social interaction much like meeting with a friend in person. However, disclosure of very private information is more likely to happen on a social networking site than in a face-to-face interaction. (Nosko, Wood and Molema, 2010). Taken with the above, it seems plausible that when a person uses a social networking site, they are not well placed to realize that what they do happens in public as far as culpability is concerned.

This is not as problematic for culpability for acts such as hacking, file sharing, identity theft, etc. as it is for culpability for crimes without clear victims, such as utterances classified as hate speech.

2.3 Synthesis

While Rawlsian thinking would seem to, *prima facie*, require that the minorities are protected against hate speech to the ultimate, in the light of the previous chapter on the working of human consciousness whilst engaged with social networking sites we can posit another desirable state. Namely, since we are likely to end up in the *majority*, we would probably want to avoid a state of legislation where we could never disengage our critical faculties lest we face criminal punishment. Habermasian thinking would seem to lend itself quite naturally to consequentialist thinking with the *caveat* that minorities ought to be protected to some empirically grounded extent.

As positive retributivism requires that the action is a wrong against universe *per se*, (Mackie, 2011) the fact that human beings have difficulty perceiving the moral wrongness of an action would seem to rule out positive retributivism as grounds for punishment in the crimes under discussion. Thus we must turn to consequentialism – and keep in mind the ethical problems with justifying violence rendered on a person on grounds of the common good – to justify punishing those engaging in prohibited speech on social networking sites. Harsh punishments for that which is not readily perceived as a grave offence obviously erode the legitimacy of the legal system, which is not a generally desirable consequence. This paper will next take a look at weighing the goals of protecting minorities and free speech.

3. How Web 2.0 makes “hate speech” criminalizations problematic

3.1. Starting point and background

Social networking sites have made certain crimes in Finland more likely to happen. Considering the previous chapters, these specific crimes should also be evaluated from the perspective of the defendant. What are the defendant’s actual chances of detecting or understanding the interests that these criminalizations, at least supposedly, protect? How can the defendant understand the equivalent causal connection between his/her action and the harm or the risk of that harm that is (supposedly) likely inflicted upon the protected interests?

Additionally, according to Finnish Criminal Law (39/1889) and Finnish case law there are also several factors that impact the defendant’s criminal liability aside the act itself. The structure of the essential elements of the pertinent crimes might also give rise to problems in this context. Is it reasonable to expect that the defendant, who is almost certainly a layman, is capable of performing valid rational

decision making based on everything that is essential considering the criminal liability while operating in Web 2.0?

In this section, the theoretical basis is the harm principle. It is not the purpose of this article to participate in the discussion on the validity of legal moralism or the harm principle – or finding any "absolute" principle or theory at all. (More on legal moralism Duff 2007, Duff & co 2010 and the harm principle in some of its forms Duff 2007, and Duff & co 2010).

Nevertheless, the less the criminalization matches the criteria of the harm principle (any of its forms), the more difficult it is for the defendant to notice the seriousness of his/her act. Thus, even if the defendant understands the moral wrongfulness (an argument for a subjectivist position can also be made) of his/her action, he/she may have major difficulties understanding the facts that may lead him/her being criminally liable for something. The defendant might just think that his/her act is mostly distasteful.

Focus in this article is in the certain types of "hate speech crimes" in Finnish criminal law, more accurately in the type of which are realized through verbal expressions (in the Web 2.0). In this article the criminal offences are "breach of the sanctity of religion" and "ethnic agitation"

3.2. "Hate speech crimes": Essential elements and objects of legal interest.

Essential elements and systematic view

According to the Finnish criminal code:

1) A person who publicly blasphemes against God or, for the purpose of offending, publicly defames or desecrates what is otherwise held to be sacred by church or religious community, as referred to in the Act on the Freedom of Religion shall be sentenced for a **breach of the sanctity of religion.** [Emphasis here] Finnish Criminal Law, Chapter 17, Section 10, paragraph (1)

2) A person who spreads statements or other information among the public where a certain national, ethnic, racial or religious group or a comparable population group is threatened, defamed or insulted shall be sentenced for **ethnic agitation.** [Emphasis here] Finnish Criminal Law, Chapter 11, Section 10

The reason that these criminal offences are more likely to be committed on social networking sites is that in both criminal offences the condition for punishability is that the expression is made in public.

The structure of the essential elements, as well as certain concepts in the criminal offence of **breach of the sanctity of religion** is strongly subject to interpretation. First we have to notice that the criminal offence has two separate *modus operandi*. The first concerns purely "blasphemy against god", while the other must be directed towards something "held to be sacred". The second also has the explicit requirement of intention ("purpose of offending"), and blasphemy doesn't have any requirement of intention (mens rea) at all.

According to Duff, endangerment offences can be categorized in to the groups of *consummate v nonconsummate* and *explicit v implicit*. Endangerment offences are *consummate* if their commission requires actualization of the relevant risk, and *nonconsummate* if it doesn't have that requirement. (Duff, 2005). As we can see from the essential elements of the pertinent crimes, the commission of the crime doesn't require that anyone actually *is offended,* or that there even is *a risk* of anyone being offended.

For these crimes to have been committed doesn't require that any conscious being, who might even hypothetically be offended, is even aware of the existence of such expression. Therefore, they are *nonconsummate* endangerment offences. It could be argued that the commission is actually an attack. But then it should be possible to find a direct causal connection between the act and the protected interest, and this paper will later consider that issue. Duff also states that an endangerment offence is *implicit* if its definition doesn't specify the relevant risk, and *explicit* if it does. Thus, logically the crime is implicit in its systematic nature.

From the defendant's perspective this notion is significant, because it extends the scope of criminal liability compared to an endangerment offence that is consummate and explicit in its systematic nature. The act itself, immediately, fulfils the requirement of actus reus.

The requirement of mens rea is also problematic. First of all, the first modus operandi (blasphemy against a god – considering the fact, that there are no preparatory works as a source of law to help in interpretation of the essential elements, this criminalization becomes even more problematic) doesn't even require any kind of mens rea. Therefore, the commission of blasphemy against a god could, in theory, happen even were the defendant unaware of the fact that he/she has committed it.

The term "blasphemy" is vague and unclear. For example someone could share a cartoon they consider amusing, but which, is interpreted by some standards, as a blasphemy against a god. Adopting a secularist position regarding justifications for criminalizations, it is unreasonable that he/she could, even in theory, be held criminally liable for a crime such as this paper discusses that he/she is not even aware of committing. Therefore, this modus operandi is a pure malum prohibitum. (For more on mala prohibitum, see Husak in Duff and Green, 2005.)

The other, second, modus operandi is more complex. At first glance it seems that there is a clear requirement of mens rea. But how is it possible, in practice, to show proof of intention if the act takes place in Web 2.0? According to Finnish Supreme Court, the offending nature of the expression is a clear implication of the offending intention of the expression. The Supreme Court reasons that because the defendant could have made his statement without the offending nature in the text, the offending nature was intentionally in the expression. (Finnish Supreme Court decision 2012:58, statements of reasoning, paragraph 23) Thus, failure to discern the offending nature becomes intent to offend.

Therefore, because the offending intention is derived from the offending nature of the expression, it is quite difficult for the defendant to deny the offending intention. Of course it is context based, but this vague legal situation causes uncertainty. It is difficult to evaluate what is appropriate and what is forbidden e.g. in political discourse.

There are also several concepts in the second modus operandi which are open for interpretation. For example "defame", "desecrate" and "held to be sacred". Fortunately, there are preparatory works which clarify these concepts. (Unfortunately it is not possible to clarify these concepts in this article. For more, see Finnish Government proposal 6/1997 5/7, preamble specific to section 10) Nevertheless, it is clear that these concepts are vague and unclear, even though the preparatory works give some guidelines.

In the offence of **ethnic agitation,** the same systematic notions apply as in breach of the sanctity of religion. Thus, ethnic agitation is *nonconsummate* and *implicit* endangerment offence.

The requirement of mens rea is slightly different in ethnic agitation compared to the second modus operandi of the breach of the sanctity of religion. Intention to threaten, defame or insult is *not* the requirement of criminal liability. However, it is not either pure malum prohibitum offence. The preparatory works clarify that to be criminally liable, the defendant doesn't have to have any intention to threaten, defame or insult. The defendant must be aware of the threatening, defaming or insulting nature of the statement or information. (Finnish Government proposal 317/2010, preamble specific to section 10)

This kind of mens rea is problematic. Consider someone sharing, on a social networking site, a biting joke in which a member of said or comparable groups is insulted or defamed, without intending to defame or to insult. Usually in those kinds of jokes some kind of insulting or defaming impression is built-in, so that it even is recognized as a joke. We have to ask whether it is a matter of criminal law to prohibit pure jokes, even if they are distasteful. Or is it reasonable at all to hold anyone criminally responsible for sharing something that is not intended to be negative but can be interpreted as negative according to some standards?

The terms "threaten", "defame" and "insult" are clarified in the preparatory works, but necessarily leave room for interpretation. Defining these terms is outside the scope of this paper. (For more, see Finnish Government proposal 317/2010, section 10)

Objects of legal protection

If we neglect the pure form of legal moralism, we have to be able to detect the protected interests, because otherwise it is impossible to evaluate, even hypothetical, causal connection between the action and the harm or the risk of harm brought to the protected interests.

According to the preparatory works the interests that are protected by the offence of **breach of sanctity of religion** are citizens' religious feelings and beliefs, which are derived from fundamental right of the freedom of religion and freedom of worship in the society in general. Explicitly is stated that any religion itself or any God doesn't need any protection. (This makes the first modus operandi even more prone to critic) (Finnish Government proposal 6/1997 5/7, preamble specific to section 10)

How does this offence harm these protected interests? Or are those protected interest at all in a need of protection? What exactly are religious *feelings*? How do they differ from "normal" feelings? Are there also "political" feelings as well? Do these need protection as well? Protecting some general feelings is taking a step towards legal moralism, which should be avoided.

It is hard to argue how, in practice, some offending expressions could restrict the possibilities of anyone to exercise his/her religion. Even if someone is offended, and even emotionally hurt, it is unclear how this restricts his freedom of religion? Though, it can be argued that if person experiences that he is offended through his religion, it could reduce his willingness to exercise his religion. On the other hand, we could argue the same way considering political "feelings". It seems harmful from the perspective of pluralistic and open political discourse if the expressions should be forbidden just because someone could hurt their "political" feelings.

Most importantly, is it reasonable to predict that the defendant understands that, when he/she is about to perform an act that might fulfill the requirements of criminal liability, she/he is, in fact and at least hypothetically, about to restrict someone's possibilities to exercise his/her religion?

In the preparatory works of **ethnic agitation** there is also a discussion about the protected interests considering this offence. The main function of this offence is to protect minority groups. To be more specific, the human value of the population of minority groups. (Finnish Government proposal 317/2010, preamble specific to section 10) Duff states that this kind of criminalization can be grounded on the recognition of the symbolic importance of assured citizenship for groups which are in various ways vulnerable.

We can accept the view that it is acceptable to protect minority groups from hatred and violence. Nevertheless, it is not obviously clear that "defaming" and "insulting" have sufficiently direct impact on the protected interests. For example, like mentioned before, distasteful jokes might "defame" on "insult" but it is not obvious that jokes like that somehow denies the citizenship of any minority group or even makes them more prone to violence or hatred, not to mention about offending anyone's human dignity. On the other hand, "threatening" might have more direct (but still indirect) effect on those interests. Thus, we might ask that would the prohibiting of "threatening" be enough to protect the interests?

3.3 Weight of freedom of speech and defendant's role to criminal liability

The fundamental rights collision that arises from these offences is between freedom of speech (It is not possible to deal all the elements of freedom of speech in this article) and freedom of religion/human value and minority groups.

From the defendant's perspective the most important question is what is the weight of the freedom of speech in this context?

In Finnish Case law the importance of certain fundamental right is measured case-specific. It is a process of "weigh and balancing". (For more on "weighing and balancing" in Finnish Law, see Viljanen 2001 and Virolainen & Martikainen 2010) The importance of freedom of speech is at its highest in political discourse. Therefore, it is extremely difficult for the defendant to perform that kind of "weighing and balancing" (so he can estimate his culpability) when it is not even clear what is considered as "political debate/discourse".

Finnish Supreme Court stated in a specific case that the defendant was a municipal mandate. And even though the defendant didn't expressed the statements in an *actual political debate, (*"actual political debate" is left undefined) but in his blog, the issues were part of his political agenda. This fact had to be taken in to account. (Finnish Supreme Court decision 2012:58, statements of rationale, paragraph 16)

It is not clear how much the Finnish Supreme Court gave weight to the fact that the defendant was understood to be a political actor. It is a legitimate interpretation that the Finnish Supreme Court made an implicit conclusion from the defendant's position as a political actor to extend the scope of freedom of speech.

This raises many questions. E.g. who is considered as a political actor? Is it only political mandates? Or someone who is just pursuing such a position? Mandate's assistant? What if the defendant does not have any political position or even interest in politics in general, but wants to participate in the political debate causally. Does he have less protection in the perspective of freedom of speech? Thus, the defendant must also take into account the role and position that he currently is, to be able to evaluate his criminal liability.

3.4. Duff and responsibility as a relation

Duff perceives the responsibility as a relation. For example a defendant is (criminally) responsible as Y for X to A. (Duff, 2007). In this context this means that the defendant has to be aware of all these facts to understand his criminal liability.

The factor Y in this context means that the defendant must be aware of his position as a political actor or just as a regular citizen. Factor X means that the defendant must understand the nature of his action. Factor A is unclear, because in this context it means that the defendant is responsible either to the society as a whole, which makes it significantly difficult to take into consideration, because "society" is quite an abstract entity after all. Alternatively, the defendant is responsible to the individuals whose protected interests are harmed or at least in a risk of being harmed. In the latter case the factor X is closely related to the factor A. As it has been argued, it is neither easy for the defendant to perceive the factor A even if it is an individual human being.

4. Conclusions

The problems with both Rawlsian and Habermasian models mean that neither can be applied in real-world legislative process. The limits of free speech or, conversely, the limits of hate speech need to be set via evidence-based policy, possibly using the Kainu-Koskinen process.

As research literature shows, the users of social networking sites tend to not be preselected for preference to engage in deep reflection and using social networking sites tends to put one into a state of deep personal interaction with others, which, obviously, is not in general linked to acting in public sphere but private sphere.

The complicated nature of "hate speech" criminalizations necessitates much further research. It is, however, obvious that while the commendable and ethically justified goal of protecting the minorities has been taken seriously, the citizen is not well placed to evaluate the legality of their actions on social networking sites.

An effort to clarify legislation would benefit both the protection of minorities and citizens belonging to the majorities. All the models for good legislation used in this paper would seem to agree that this is a good thing.

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DEVELOPING THE NEXT GENERATION OF IT PROFESSIONALS – ENGAGING IT STUDENTS IN THE PRACTICE OF IT PROFESSIONAL ETHICS

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Abstract
This paper describes the approaches taken to teach IT Professionalism and Professional Ethics to IT students in Sheffield Hallam University. The aim is to help students develop their awareness of the issues around professionalism in IT to the point where it becomes one of their career considerations. We describe how we have worked with three different year groups, basing teaching on IT ethical issues as the core engagement tool. We describe some of the teaching techniques and support tools, and conclude by identifying areas of practice which may be of value to other teachers.

Keywords
Professionalism. Ethics. Values. IT. Teaching.

1. Introduction

The "possibilities of ethical ICT" are likely to remain possibilities rather than realities unless those entering the IT industry do so with some level of commitment to the value and desirability of IT Professional Ethics, and more generally, professionalism in IT. In this paper we discuss how we are responding to the challenge of instilling within our students awareness of, and commitment to, IT Professional Ethics. The paper will describe the development, practice and outcomes of teaching, learning and assessment activities focused upon building IT students' commitment to a professional ethos in terms of their future behaviour, personal development and working practices.

1.1 Background

Students entering a Higher Education institution intent on destinations in Medicine, Law, Teaching or any other recognised profession will understand that in doing so they are making a commitment to a set of professional standards, codes of practice and ethics. This is not the case in Information Technology. It is notable that leading writers (Adams, 2008) (Johnson, 2009) (Quinn, 2011) focus their discussions on explaining and justifying the case for professional status rather than treating it as a basic, established fact. Our experience with new IT students is that their understanding of a future in IT is focused on technologies, skills and employability, but rarely upon notions of professionalism or ethical behaviour.

Information Technology, in the eyes of those seeking to build careers in it, has a degree of fame, if not infamy, about it. It has legends and famous personalities. IT personalities are seen more as role models of entrepreneurial achievements rather than models of professionalism. It is these IT celebrities who create perceptions among the next generation of IT workers of what will be expected of them and what life working in the industry will be like. Innovative technologies, varied jobs, and being part of a fast moving, global industry are all features which make IT such an attractive and exciting career aim, but these come with other less desirable and potentially damaging features such as a lack of accountability for product quality, and acceptance of irresponsible, unethical and even illegal behaviour as a norm.

The challenge then for those engaged in the process of preparing new entrants to IT is twofold: first to build their awareness and understanding of IT Professionalism and Professional Ethics; and secondly to encourage the transference of that understanding to their perceptions of how they will work and what will be expected of them in their future IT careers. In short, the aim of the teacher and lecturer is

to foster in IT students commitment to careers which adhere to the codes of practice, standards and behaviours appropriate to an IT Professional.

1.2 Teaching IT Professional Ethics

In Sheffield Hallam University the teaching of Professionalism has two features. It is distributed across all IT courses, the aim being to achieve a level of integration where "Information Technology" and "Professional" are seen as parts of the same package. Secondly, Professionalism is linked closely and consistently with employability, the message being that professional behaviour and standards are supportive of successful career building.

In this paper we will focus in detail on what could be seen as the first, and possibly the most important element of responding to this challenge, that is to generate a realisation among Information Technology students that Professionalism and Professional Ethics are concepts which have a direct and immediate relevance to them. While the supporting literature is excellent, it naturally tends to use as its examples headline cases which are either extreme situations or which relate to the decision making of those leading the global giants of the industry. Our experience is that the study of this material is very effective in creating awareness, along with opinions and indignation, but it tends to reinforce a perception that IT Professional Ethics do not have a direct impact on the behaviour of the ordinary IT worker. The approach developed in a number of our Professional modules is aimed at making the issues real and immediate to each student.

The approaches and methods used differ depending on the level and makeup of the student target group, though the objectives are the same. Post-graduate classes contain students from a wide range of countries and cultures, and there are usually a significant number with IT industry work experience. For Final year Undergraduate students thoughts about careers and work in the IT industry will be growing in importance as they enter the employment market and many will have completed a placement year as well, whereas new entrant students will typically not have thought beyond the technology they expect to encounter in their learning.

2. The Case Study

In this paper we describe how activities such as role play and formal debates are used in conjunction with analytical framework tools to focus student reflection and understanding on what Professional Ethics means to them individually, and the impact it has on their career decisions and future working life. Two analytical framework tools have proved to be effective in helping students relate concepts of Professionalism and Professional Ethics to their personal career planning. One helps students explore the role of personal and professional values in their career planning. The other examines the wider impact of Information Technology using the four SLEP modalities (Social, Legal, Ethical and Professional). The rationale, content and use of both frameworks will be described in detail.

2.1 Year 1 - Revealing the norms of first year IT students with respect to IT Professionalism and Ethics

The first challenge for staff at SHU is to introduce and investigate the idea of professionalism with first year students studying a range of IT related courses as part of the Professionalism and Communication module. This section describes how a newly devised framework was trialled with first year student teams in this module.

Small student teams of around 4 or 5 members were asked to investigate and report on an IT related issue and to consider the social, legal, ethical and professional aspects of their chosen subject. This task required the development of a number of skills including searching, filtering and evaluating the quality of information from a variety of sources, and synthesising and presenting the outcome of the investigation. Along with tutorials to instruct in the use of search and information evaluation tools we needed to provide a tool to help students investigate their chosen topic from different perspectives and from the social, legal, ethical and professional viewpoints in particular. The tool/framework (Tables 1

& 2) (Keefe, 2012) was developed and used with two general computing tutorial groups over a number of tutorial sessions. In the first session the use of the framework was modelled by the tutor and the question under investigation was;

'I think it is acceptable to download music files and share with others using P2P software'

The framework requires students to first of all identify any stakeholders that could be affected by this question. The students were then asked to comment on any issues, positive or negative with respect to a given IT issue, from the point of view of these stakeholders and to categorise them as social or legal issues. Other strands of the framework would lead towards the identification of appropriate professionals associated with the issue and gradually towards the development of an ethical stance.

During the first session the students worked initially in their teams to identify stakeholders, which were recorded onto a master copy of the framework. The teams then discussed the various possible viewpoints, which were captured during a round robin and recorded on the grid. The framework was projected and the tutor recorded the issues raised by the students as positive or negative along with the detail. This approach is similar to that taken when applying an 'act utilitarian' ethical framework. The final framework was very similar to a tutor populated grid based on published research on peer to peer users' ethical stance (Shang, 2008) and conceptions of Napster (Spitz & Hunter, 2003) which was shown to the students at the end of the first session.

During the following weeks the teams ran a shortened version of the first session for their particular issue under discussion and with help from the tutor followed the process modelled in the first session. Due to time restrictions, the students focussed on collecting the social and legal issues for multiple stakeholders. Teams would be responsible for generating the professional and ethical standpoints to be presented in their assignment.

Results

There were two interesting outcomes from the tutor led session. The first was that with respect to the question;

'I think it is acceptable to download music files and share with others using P2P software',

Students who expressed an opinion about the ethics of the statement were generally in agreement with the idea that peer to peer sharing was a good thing despite having identified copyright infringement as illegal. Students who had voiced an ethical viewpoint appeared to align themselves with the peer to peer users, and indeed many of them were currently peer to peer users. Typical comments included 'with peer to peer websites there are more benefits to be gained from sharing than abiding by copyright law'. It seems that the students who participated in these seminar sessions had a relatively simplistic world view in ethical terms despite having the cognitive ability to identify multiple different viewpoints.

This position maps onto Perry's stage 1.

'Perry outlined a nine-position scheme of intellectual and ethical development in which each stage represented a different set of assumptions about knowledge and values. He begins with a very simplistic world-view in stage 1, in which everything tends to be polarised in terms of we-right-good against others-wrong-bad.' (Lochrie, 1989)

The second interesting outcome was that first year students were able to generate the different stakeholder positions and viewpoints, but they had difficulty in identifying IT workers, in this case peer to peer application developers, as professionals relevant to the scenario, and tended to identify the record companies and recording artists as the only workers to be classed as Professionals. This difficulty in identifying IT workers as professionals relevant to the issue was also apparent when the students conducted the same exercise on their chosen issue in the following tutorial sessions.

2.2 Final Year – Preparing to work as an IT Professional

The original work to develop the SLEP Analytical Framework took place over the two years preceding its application to the Year 1 classes described above. It was conducted simultaneously with similar work with Postgraduate cohorts.

Teaching of IT Professionalism had been unpopular with students. The module aim was to develop students' employability and professional awareness but for a range of reasons it failed to engage students who generally struggled to understand what it was trying to achieve. The module focused on the process of creating an academic standard discussion paper for an assignment, but with little development of the content and issues. Students were asked to conduct their research and analysis away from the class. In 2010 a new teaching team restructured and refocused the content.

For the Final Year classes, comprising around 120 students each year, the learning process was essentially delivered in two parts, the first of which was part of the employability awareness teaching. The learning objective for this element of the module was to enhance students' career decision making ability by encouraging them to focus on their aspirations, competences and values. The first two clearly support job-seeking activities. The third acknowledges the importance of personal values in developing career decision criteria. Using a simple assessment instrument based upon the work of Lovell and Fisher (Fisher & Lovell, 2009) we asked the students to consider what aspects of working and employment were important to them in deciding what careers and jobs they wanted to pursue, or to avoid. The ? He Values reflective tool was first used in the context of IT Professionalism with Postgraduate students who responded well to it, as described in the next section.

The Values assessment provided a reference point to the second part of the module which addressed Professional Ethics. The changes introduced were designed to generate engagement in the issues by making the analysis of issues a class activity and by focussing on issues which the students perceived as being of interest and relevance to their lives and career situation. The purpose in changing the teaching methods and learning content was to re-connect students with the module aim of building student's awareness of the benefits, responsibilities and challenges associated with being an Information Technology professional, with the hope that this would lead to personal commitment.

For the class exercise the discussion focused upon an IT related current news item. We found that the important criteria for selecting a subject was that it was something about which the students would have an opinion. Initially debate was unstructured and views expressed were one sided and narrow in focus. The use of the SLEP analytical tool encouraged students to take a holistic view of the issue, to explore the range of opinions, and to consider the implications for those working in the IT industry, that is, for IT Professionals. The results were consistently successful. There was a clear progression in thinking and understanding evident during these class sessions. For example; one popular discussion headline came from the BBC News site, "Why do people play music in public through a phone" (Hudson, 2011), an item specifically chosen for its potential generational bias scope for polarised views. The flow of this and other classroom discussions typically went through four phases:

Initial reaction - expression of personal views, often in defensive or emotional terms;

Analysis - using the SLEP process to take a more holistic view by identifying stakeholders and defining their concerns;

Critical exploration - moving into a more objective understanding of different viewpoints and appreciation of concerns;

Discussion of responsibilities - an unexpectedly successful conclusion in which students discussed the role and contribution of IT practitioners to the issue in question.

At the end of the module each student produced a written paper analysing and discussing an IT related issue of their choice. For the teaching team this was a particularly rewarding exercise as students consistently exceeded expectations both in terms of commitment to the work, and quality of the end product. Many students went beyond the class content into the philosophical aspects, relating viewpoints to utilitarian and Kantian perspectives for example. In module feedback many students welcomed the opportunity to discuss issues they felt important.

Further developments (Final Year continued - ethics in strategic analysis?)

Recently the SLEP Analytical tool has been introduced to a Final Year Class studying Business and IS Strategy, the aim being to demonstrate it as a useful technique for strategy analysis, but also as part of the process of embedding the teaching of IT Professional Ethics in to mainstream IT teaching. To demonstrate how the process works the contents of the analysis are contained in the tables below. The topic was simply, "is Professionalism in IT important"

Table 1: First Phase Stakeholder perspective

Stakeholder	Concern	Issue
General Public	Misuse of personal data	Low public trust in IT
IT Student	Not a meaningful status	No professional recognition
IT Practitioner	Competing with unqualified jobseekers	Career opportunities and progression
IT User	Reliant on unreliable IT	No controls over IT industry

Table 2: Second Phase SLEP Analysis

	Issue
Social	Low public trust in IT, Society reliant on uncontrolled IT providers
Legal	Data Protection and other IT laws unclear and often flouted.
Ethical	Abuse of trust and specialist knowledge Customer users not always respected
Professional	No formal recognition of IT status Low motivation to embrace professional standards

Third Phase – Discussion and conclusions

Although this session was essentially a demonstration, the short discussion which followed indicated that the students had recognised some of the issues as being relevant to them. They pointed out that professional status was meaningless without some form of regulatory authority. They recognised why there should be public distrust in IT and that it related to day to day contacts between IT practitioners and the public, not just those corporate failings usually highlighted as case studies.

2.3 Post-graduate

The majority of postgraduate students at Sheffield Hallam, as with most UK universities, come from overseas, many with extensive work experience, though many are also fresh from the undergraduate studies. The aim of the module is to develop understanding of IT professional practice and skills. The focus is on professionalism and the ethos of the module is to deliver it in a way which reflects practice in the workplace. Consequently it is delivered as a block week long training course, and includes examples of developmental activities frequently experienced during in-work training, but not the norm in academic teaching.

As with the undergraduate students the approach was based upon students reflecting upon their own attitudes and values in the context of ethical and behavioural responsibilities expected of an IT Professional. Two very different approaches have proved consistently successful over the last three years and 6 occasions that this module has run. The first has been a formal debate aimed like the Final Year exercise described above at getting students to identify and consider different perspectives on an IT ethical issue. The second was intended to help students to recognise a personal relationship between their career aspirations and the professional issues discussed during class. Students were asked to create a role play or other performance which would demonstrate an aspect of IT Professional behaviour in practice. To emphasise the human nature of the subject the event had to be entirely analogue. These performance events have been successful on two levels. First they have clearly demonstrated that students had developed a level of empathy between themselves as IT Professionals and their imaginary clients or members of the public. Secondly the level of engagement to the learning process has been extraordinarily high, particularly bearing in mind the wide range of cultures and nationalities represented in these classes. The lesson might be that to teach concepts as intangible as ethics and professionalism it might be valuable to introduce some fun into the process as we have had presentations which have included drama, mime, song, dance, and one delivered in full Bollywood style.

Student reflection and feedback has again been positive. Statements like *"I could not see the point of this module when I started, but now I think it is one of the most important modules of the course*" are not uncommon. The assessment work submitted after the teaching event indicates a high level of understanding of the learning content, and possibly more importantly, its relationship to future career paths and professional behaviour.

3. Observations and Conclusions

The title of this paper is "Developing the next generation of IT Professionals – engaging IT students in the practice of IT Professional ethics". In writing it we set out to examine our experience teaching three different year groups with the aim of identifying where we may have been successful in instilling within our IT students a sense of professionalism and professional ethics to go alongside the knowledge, skills and expertise on which they will build their careers. Most of this examination is a reflective account rather than a report of research, but nonetheless we feel our observations and suggestions are valid and, we hope, helpful.

For education colleagues challenged with the task of adding IT Professionalism and Ethics to the career toolkit IT students take away with them into the IT industry, and indeed into the world at large, our reflection points to a number of practices you might consider including in your teaching.

First, a participative approach built around discussion of issues to which the students relate creates interest in the deeper concepts. It was notable that the Final Year groups, having engaged in topics which they felt were relevant to them, and then moved on the study some of the case studies which they had originally seen as remote and irrelevant.

Second, an analytical framework was valuable on two levels: first, as a classroom demonstrator; second, as a model of the logical flow of thinking along which students could progress.

Third, encouraging students to relate learning to their personal career development …?. This is something which could backfire if mistimed or done at the wrong pace, as had been the case at Sheffield Hallam. However, we felt there were positive indicators among both the undergraduate final year students and the postgraduates that they were including thoughts about values and professional ethics in their career thinking. Arguably they were already doing this at a subconscious level and it may be that our contribution was to help them articulate their thinking.

In his recent paper on Philosophy in the Workplace Professor Mark Addis discusses the value of philosophical disciplines and thinking to those in traditionally non-philosophical occupations, for example construction (Addis, 2013). While we have not gone as far as to specifically introduce philosophy into our teaching of Information Technology subjects, we have adopted a similar approach for teaching students about professionalism and professional ethics. That is we have attempted to demonstrate that there is a positive value in understanding the relationship between concepts, ethics and professionalism in this case, and occupational behaviour. In examining the teaching of IT Professional Ethics at three levels of study, First Year, Final Year and Postgraduate, we have observed indications of learning and progression from a state of unawareness, through recognition, understanding, engagement and, we believe, to a point where the issue of commitment is acknowledged. We hope this will lead to actual commitment to the principles and disciplines associated with IT Professional Ethics as careers are developed.

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RETHINKING EDUCATION: STEM BECOMES A STEAM PROJECT

Shalini Kesar

Abstract
This paper describes an on-going project designed and implemented by the researcher, as an "out-of-school" computer related activities that integrate arts and creativity. The effort towards Science, Technology, Engineering, Arts, and Mathematics movement championed by Elementary School is the first of its kind within its district. The school is located in a rural and geographically isolated community in the United States.

Keywords
STEM, STEAM, Computer related activities, Elementary School.

1. Introduction

Recognizing the importance of adding the element of arts and creativity into Science, Technology, Engineering and Mathematics (STEM) curriculum is now gaining importance in schools. This is based on two claims. First, it is believed that arts as a subject is perceived and known to use different tools when dealing with the world than what of science and engineering. Hence, STEM with arts can actually provide a useful tool to make the engineered world or object more appealing and thus acceptable and useful to people. The second claim is based on the limitations of scientific research, which some see as lacking creativity and fun. Art, in this view, is a means to free the scientist's and engineer's mind. It should be noted that highly selective STEM specialty schools encourage their students to pursue the arts, be that poetry, music, theatre, or any other aspect of it. Both claims have led researchers to attribute to the shrinking pipeline of STEM field, particularly computer science in girls. Some efforts is under way, including some at the National Academies, that mean to explore whether education can benefit, just as research already does, when the four are somehow linked with arts. Consequently STEM acronym has now moved to STEAM.

Effort towards STEAM movement championed by North Elementary (NE) School is the first of its kind within its district. It is, located in a rural and geographically isolated community in the United States. NE has transformed school policy to place art plus design at the center of STEM; encourage the integration of Art plus Design at elementary level education; and influence teachers (with the support from university faculty) and guide teachers to drive innovation. The researcher of this paper is the faculty of the university where STEAM partnership with NE was recently established. To further advocate the STEAM effort, the researcher, initiated a "out-of-school" computer club in October 2012. The intent of this STEAM project as an "out-of-school" involves hands-on/minds-on activities. This formed a starting point in creating a learning environment that helps in formulating computing problems in a way that enable and integrate arts and creativity to use a computer and other tools when solving these problems. Consequently, this will allow students, particularly girls, to engage in and relate Computer Science (CS) education as "exciting and creative" activities while exploring and enhancing computer science skills.

Against this backdrop, this paper describes an on-going project designed and implemented by the researcher, as an "out-of-school" computer related activities that integrate arts and creativity. Further, it will help in creating an environment where students can engage and observe the ways that artistic perspectives and computer activities/ concepts are intrinsically related. The paper is divided into four sections. After a brief introduction in section 1, the paper discusses the emerging themes from various studies in section 2. This is followed by the details of the on-going research project in section 3. This is then, followed by conclusion in section 4.

2. Main Emerging Themes

In the context of focus of this paper, three main emerging themes in the current literature studies are discussed below.

One, researchers argue that there is a need for recruitment of computer professionals. Ladner and Vandegrift (2011), for example, in the special issue of ACM Transactions on Computing Education (TOCE), pointed out that there is a critical need for more computer professionals because the computing field is one of the fastest growing sectors of the economy in the United States and world-wide. Hence, this problem needs to be tackled at school and university level. This is because current statistics indicate that the shortfall will pose a problem for the future if the numbers stated by National Center for Women in Information Technology (2007) are correct. They indicate that by 2018 there will be 1.4 million CS specialist job openings and if this problem is not addressed, then universities will have only generated graduates to occupy 1/3 of these openings. Hence, it can bring an under-production of the CS work-force and also longstanding under-representation of many segments of the population that include gender and ethnicity (Abbiss, 2008).

Two, not only there is a shortage, the disparity between the number of females and males in the field is large. Literature also shows a pool of studies highlighting different viewpoints on women in computing and the shrinking pipeline (for example, see Kekelis et al., 2005; Klawe et al., 2009). The 2000 ACM SIGCSE Bulletin-Women and Computing published articles where researchers echoed the importance of increasing minorities and under-representative groups in CS (NSF, 2004, 2007). They argue that increasing the participation by more than half the population currently represented by these groups is vital to the growth and sustainability of the field (also see, Alper, 1993; Camp, 1997, 1999). In sum, the CS workforce is crucial to the United States innovation capacity and global competiveness. Yet, women and minorities are vastly underrepresented in the CS jobs.

Three, shortage of CS skills has led researches to echo the belief that art is the key to building a strong economy. In other words, art and design are poised to transform our economy in the 21st century like science and technology did in the last century. Therefore, it is significant to integrate art and design into STEM. Hence, it has been argued that innovation and elements of art is still seems tightly coupled with STEM (the acronym STEM needs to become STE**A**M[1]). Consequently, the "A" skills in the 21st century actually apply to a larger, broader segment of the workforce than STEM skills. For example, the Conference Board and Americans for the Arts, in association with the American Association of School Administrators (AASA), conducted a survey of executives and school superintendents. The study, called "Ready to Innovate" conducted by Lichtenberg et al. (2010) demonstrated that more and more companies are looking for skill sets in their new employees that are much more arts/creativity-related than just science/math-related. Companies want workers who can brainstorm, computing problem-solve skills, collaborate creatively and contribute/communicate new ideas. Their research confirms that there is a "need for both superintendents and employers to take a hard look at the steps required to revise curricula and restructure training programs to develop creativity".

More recently, on February 6, 2013, Congresswoman Bonamici [2] and others voiced their opinion on the importance of STEAM education before a hearing of the U.S. House Committee on Science, Space and Technology. Witnesses at the hearing, entitled "American Competitiveness: The Role of Research and Development," included Richard Templeton, President and CEO, Texas Instruments; Dr. Shirley Ann Jackson, President, Rensselaer Polytechnic Institute; and, Dr. Charles Vest, President, National Academy of Engineering.

This pathway, is believed to, increase the USA economy competitiveness. Many examples reflect the importance of the STEAM movement. For example, The national network for Sciences, Engineering,

[1] For example, http://stemtosteam.org/

[2] See video coverage http://www.youtube.com/watch?feature=player_embedded&v=GU425V3NSkE

Arts, a& Design (SEAD)[3], headed by Carol LaFayette, associate professor of visualization at Texas A&M, is advancing the STEM to STEAM movement by adding art and design components into teaching and learning. Further, LaFayette commented, "Since its inception, the Network for Sciences, Engineering, Arts and Design has gained an international groundswell of interest and enthusiastic support for creative, innovative research and practice through exchanges across traditional boundaries," Further, she commented, "Everyone wants to learn more about this phenomenon and how it can be nurtured. Contributors include educators, researchers, artists, scientists, engineers, designers, entrepreneurs, and many others."

Indeed arts are seen as providing a significant contribution to creativity and cultural development In their study of nineteen international schools, Sharp and Le Métais (Sharp and Le Métais, 2000), point out that many educational systems are exploring the extent to which they need to: develop a clear rationale for education in creativity, cultural education and the arts; find effective ways to embed these educational aims within the curriculum and its delivery; monitor how well the aims are being delivered; identify and act upon the factors that facilitate/impede their realization.

There is no doubt there are challenges in adding arts and creativity to science education curriculum. The challenges mentioned in the international study mentioned earlier are also similar on arts education in science. Interestingly, some of the main emerging themes reveled in this study are no different from beliefs, challenges and priorities shared by North School's principal and teachers. The challenges include where there is a:

- A recognition that creativity is important, and that its development should be encouraged in schools;
- A realization that cultural education is an essential component in helping pupils feel included and valued;
- An acknowledgement of the key role of the arts in the curriculum in developing creativity as well as cultural understanding;
- A concern about how to organize and manage the arts in the context of the demands of the whole curriculum, including the necessary emphasis on literacy and numeracy;
- A need to find effective ways of raising the profile and status of the arts in education.

In general, studies show a new recognition of the key role of creativity in contributing to economic competitiveness. Many countries facing cultural pressures as a result of globalization are accepting that cultural education is important to preserve diversity and promote inter-cultural understanding.

3. Hands-on/Minds-on Computer Club

Elementary School (ES) began its journey as a STEAM/Partnership school in August of 2012.With support from its neighboring local university. The school aims to offer an enriched, integrated curriculum that focuses on science. Language arts, technology, engineering, fine art, and math skills will be used as tools to teach science in a way that encourages inquiry, communication, collaboration, discovery, and enthusiasm for learning.

Taking examples from leaders such as the president of the Rhode Island School of Design[4] spearheading this movement, ES aims to move the same direction. In general, the objectives of the STEAM movement[5] are to:

[3] See http://sead.viz.tamu.edu/ also see white paper http://seadnetwork.wordpress.com/white-paper-abstracts/final-white-papers/

[4] Also see, http://www.artofsciencelearning.org/index.php and http://www.newscientist.com/blogs/culturelab/2012/08/john-maeda-steam.html

[5] See http://stemtosteam.org/

- Transform research policy to place Art + Design at the center of STEM;
- Encourage integration of Art + Design in K–20 education;
- Influence employers to hire artists and designers to drive innovation.

As mentioned earlier, this paper describes the computer club, one of the "out-of-school" activities, part of the STEAM movement. This computer club's goal is to conduct a pilot study to:1) Create a rich research base by combining the existing related literature with the findings of the pilot study; 2) Provide opportunities with in CS education incorporating arts and creativity to motivate and engage a diverse group of students; 3) Create an interest from under-representative groups, specifically Hispanic, Native Paiute, and young women to engage in hands-on/minds-on activities, which allows them the ability to engage in computational critical thinking. This in turn, will provide them opportunities to communicate and work with others to achieve a common goal. Also, the findings of this study would help to develop or modify existing inter-disciplinary curriculum and pedagogy at ES, which would give students a well-rounded base of knowledge that prepares them for the future.

The researcher facilitated a weekly computer club as part of the after school activity at the elementary school. This school is unique as it is the only school in the district that has pushed towards the STEAM effort. This school has made an effort to add creativity and arts into their science curriculum. With this in mind, the Hands-on/Minds-on Computer Club aims to address by reaching out to students who are female, diverse in ethnic backgrounds and from disadvantaged homes, and offering them fun and creative ways to learn about hardware and software.

In 2012, six weekly sessions (starting October 10th) were conducted for an hour and half. Student audience included third to fifth grade. Initially, five students enrolled that increased to eleven. The success of first program has led to an enrolment of 19 students in the February 2013 program. The club aimed to engage students, particularly girls and minority groups who otherwise may appear to be out of the computer science radar. Hands-on/minds-on computer related activities were designed to be fun, creative and engaging. It is hoped that, that, in turn, will contribute towards creating interest and increase participation & self-confidence for young students in the field of computer science (Alper, 1993; Pearl et al., 1990). This is significant, as it has been argued that it is the best way to create awareness and raise a curiosity within young students enabling them to pursue areas of study within the field of computer science in the future. Interestingly, students who enrolled in the club later admitted they were hesitant to join the computer club because they perceived it would boring and difficult. However, after hearing from their friends in class how much they learnt in a fun and enjoyable environment, they decided to join this after school activity.

Based on the goals of Elementary School, the underlying research questions around both current and future project designs is:

- Is the curriculum (topics covered) useful for engaging students in 'fun' and creative hands-on/minds-on computer related activities? What could be improved?
- To what extent does exposure to the most up-to-date technologies and technological tools contribute to the students' motivation and hence, spark an interest to think about actually pursuing a career in computer science field?
- How can we best disseminate this important information to the appropriate public elementary schools or/and school district?

Overall hands-on/minds-on activities focused on:

- Exploring inside a computer and then researching the computer hardware chosen;
- Creating a poster using Pages software;
- Using iMovies to create a movie where students describe their findings;
- Using different tools (e.g. NBC learn) to find interesting videos about computer hardware;
- Using gmail and google docs to write reflection papers.

Two undergraduate students worked under the researcher's supervision. Their main roles and responsibilities included:

- Developing and editing videos of students using programs such as iMovies and Vegas Movie Studio;
- Creating guidelines using software (iWorks) to teach elementary students how to effectively create posters using Apple Pages and Keynotes;
- Researching the hardware components that are put inside of a computer such as the mother board, graphics cards, and the central processing unit.

4. Conclusion

The success of the computer club has led to an on-going after school activity every semester. The benefits of this on-going project are several: 1) A committed relationship between the researcher and the school has resulted in conducting a summer workshop for all children from other elementary schools. 2) The researcher has been invited to facilitate such programs in other schools. 3) Recognizing the importance of reaching as many minority students as possible and exposing them computers as led the researcher to be invited to work with the Multi-Cultural Center. 4) Given that the researcher herself is a female and from international background, she has acted as a important mentor and role model to many young girls in the school. 5) The computer club has been reflected as "best practices" in Utah, Women and Education Initiative website[6]; 6) The findings of this on-going study will continue to examine the extent of program scalability to increase the participation of all students at elementary level. This is vital to the growth and sustainability of the CS field, and the future of the nation's workforce.

To conclude, this paper contributes by reflecting the on-going pilot project in the context of STEAM movement. This pilot project has not only promoted awareness, motivation, and participation of under-representative and minority groups, but has also addressed other barriers that researchers attribute towards the shrinking of the pipeline in CS. These all are significant that directly or indirectly impact the CS area in general and its effort in reducing the gap between male and female enrollment in such fields.

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USING TRIPLE LOOP LEARNING IN CONTEXT OF MANAGEMENT OF INFORMATION SYSTEMS SECURITY

Shalini Kesar

Abstract
Taking into account various studies on the increasing problem of computer crime within organizations, the researcher argues that management of such crimes requires an equal focus on technical, formal and, informal (social) issues associated with Information Technology (IT). This is because focusing on the technical issues only provides a *partial* solution while managing such crimes. While understanding management of computer crime, this paper contributes to provide a different perspective by using the organizational theory, Triple Loop Learning (TLL).

Keywords
Information systems security, computer crime, technical, formal and informal controls, triple loop learning.

1. Introduction

Taking into account various studies on the increasing problem of computer crime within organizations, the researcher argues that management of such crimes requires an equal focus on technical, formal and, informal (social) issues associated with Information Technology (IT). This is because focusing on the technical issues only provides a *partial* solution while managing such crimes. Consequently, the complexity associated with such crimes within organizations can be *fully* understood when the context of the work place is also taken into account (see Dhillon 2000; Audit Commission 2005, Kesar 2005).

Computer crimes involving theft are very diverse. The gaining of access and removal of property through the use of electronic resources generally defines computer crimes. According to Rushinek & Rushinek (1993), this property may include money, service, programs, data, or computer output, and computer time (also see Haugen & Selin, 1999, CSI/FBI reports). In addition, altering computer input or output without authorization, destroying or misusing proprietary information, and the unauthorized use of computer resources (theft of computer time) can be considered theft-related computer crimes. The U.S. Department of Justice (DOJ) broadly defines computer crimes as "any violations of criminal law that involves knowledge of computer technology for their perpetration, investigation, or prosecution".

While understanding management of computer crime, this paper contributes to provide a different perspective by using the organizational theory, Triple Loop Learning (TLL). Learning organizational theories are based upon a "theory of action" perspective. An important aspect of such theories is the distinction between an individual's espoused theory (organizational goals and mission, formal documents, such as policy statements) and their "theory-in-use" (what is done in practice). The efficacious use of TLL is to strengthen the argument that awareness and training is a key ingredient of management of computer crime that needs to take into account technical, formal, and informal aspects of information security. Given the ever changing nature of organizations today, “suitable opportunities” for the occurrence of computer crime is increasing within the working environment.

The paper is divided into three sections. After a brief introduction, section 2 briefly discusses the theoretical framework of TTL in the context of the focus of the paper. It uses the key factors of the TTL framework to understand the problem of computer crime within organizations. Conclusion is presented in section 3.

2. Theoretical Framework

The theoretical framework of the triple loop learning by Argis and Schön (1996; 1978; also see Argyris, 1997), can be explained as double-loop learning about double-loop learning (see Diagram below). Yuthas et al (2004) define triple-loop learning as "a continual reflection on the learning process, the contexts within which learning occurs, and the assumptions and values motivating the learning and influencing its outcomes." It is thereby striving at trying to see beyond the current situation and try to avoid ad hoc manner (see diagram below).

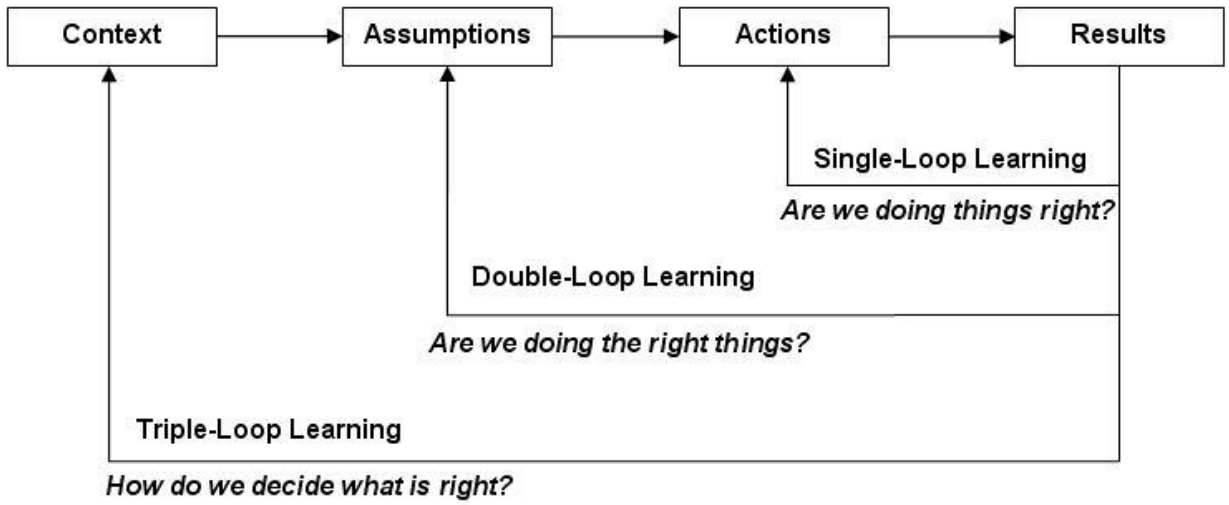

Figure 1: Triple Loop Learning

In brief, single-loop learning is based on the assumption that problems and their solutions are close to each there in time and space. Hence, in this sense, it involves doing things better without necessarily examining or challenging our underlying beliefs and assumptions. Double-loop learning works with major fixes or changes, like redesigning an organizational function or structure. Whereas, TLL framework challenges the structural context and factors that determine underlying assumptions and beliefs. Therefore, the triple-loop learning focuses on questions such as "are structural contexts and factors limiting our ability to attain desired changes"? Hence, this form of learning goes beyond insight and patterns to context.

In the context of management of computer crime, TLL framework can provide a deeper understanding of the nature of the problem. Subsequently, it can facilitate a shift in the perceptions of previous mindset reflected in various studies that perhaps have provided a partial solution to the current problem of computer crime. In her paper, Mattia (2011) defines "awareness" + "change" is as "learning", and reflects on why the involvement of the learner is so crucial to any kind of planned change. This can be a better way to understand "managed learning" as part of a comprehensive solution for computer crime. Against the backdrop of the above diagram and discussion, management of computer crime in the context of TLL is discussed below.

2.1 Results

To turn the tide in the fight against such crimes, it is important to know its true impact on the world economy. Various sources (CSI/FBI 2011) suggest that incidents of computer crime are increasing in number causing significant concern among organizations across the globe. Statistics may underestimate the real situation as many organizations may be unaware that the information security of their systems has been actually compromised. It is clear that the growing problem of computer crime is further compounded by the fact that such cases are not restricted to one particular country and are rarely reported. What is even more alarming is that it is the employees who pose one of the greatest threats to organizations today. Hence, computer crime could have a greater impact than the

conventional crime. The CSI/FBI (2011), for, example, outlines key findings from July 2009 through June 2010:

- Malware infection continued to be the most commonly seen attack, with 67.1 percent of respondents reporting it;
- Fewer respondents than ever are willing to share specific information about dollar losses they incurred:
- Slightly over half (51.1 percent) of the group said that their organizations do not use cloud computing. Ten percent, however, say their organizations not only use cloud computing, but have deployed cloud-specific security tools;

Similarly, the 2011, IC3[1] on computer crime reflected demographics that showed approximately 51.76 percent are male and 48.24 percent were female. Whereas in 2010, 53.10 percent of complainants were male and 46.89 percent were female. These numbers reflect a trend in recent years where the number of male and female complainants interestingly is equalizing. Recent published report (Second Annual Cost of Cyber Crime Study[2]) by the Poneman Institute; a U.S. based information security policy research center also reflects alarming statistics. The report states that "over the past year, the median cost of computer crime increased by 56 percent and now costs companies an average of $6 million per year." This statistic was compiled using a self-report survey of 50 U.S. based businesses. Findings from other countries reflect just as alarming statistics. For example, in 2002, the cost of identity fraud in Australia was estimated at A$1.1 billion (Cuganesan & Lacey 2003). Other countries include Canada, the United Kingdom, and India.

2.2 Actions

In dealing with minimizing computer crime, most organizations implement only technical safeguards (see Kesar, 2005 for detailed literature review). As mentioned earlier, Mattia (2011) uses double loop learning to argue that using learning loops in information security are crucial to change mindset of employees about such crimes. Further, enhancing awareness about loop learning is especially relevant to decision making skills that are necessary for security related management controls (strategic decisions). This is because it focuses on analysis of the assumptions and implicit rules underlying the organization and setting the security objectives and goals. According to her, loop learning is an effective strategy for managing the two forms of theory of action. Mattia, further points out that loop learning awareness theory has three basic steps that are initiated when a mismatch occurs in the process of loop learning in the context of management of computer crime. These are: awareness; identify vulnerabilities; and efforts to manage vulnerabilities. Although, these steps relate to double loop learning, yet they help in thinking of the problem of computer crime "outside the box". This then leads to greater understanding about organizations and employees regarding beliefs and perceptions about management of computer crime. As mentioned earlier, triple-loop learning might be explained as double-loop learning about double-loop learning. Hence, triple-loop learning involves "learning how to learn" by reflecting on the issues discussed below.

Awareness: It is clear that there is still a lack of awareness about the tools need to minimize the occurrence of computer crime. Researchers argue that management of such crimes is now evolved from having a purely technical focus, to incorporating other equally important aspects of information security such as behavioral and economic ones. To enhance awareness about such issues, Mattia and Dhillon (2003), for example, use 'double loop learning' as a means to address the human factor in information security. Other information systems researchers have echoed that awareness is a key component of information systems security and have looked at various perspectives (for example, see Pahnila, et al., 2007; M. Siponen, 2001; M. T. Siponen, 2000).

[1] See http://www.ic3.gov/media/annualreport/2011_ic3report.pdf

[2] See http://www.hpenterprisesecurity.com/collateral/report/2011_Cost_of_Cyber_Crime_Study_August.pdf

Vulnerabilities*:* Statistic mentioned above already reflects on the seriousness of the problem of computer crime. A recent report (2011)[3] conducted by independently conducted by Ponemon Institute reflected on the key vulnerabilities organizations facing today. The companies in their study experienced 72 successful attacks per week and more than one successful attack per company per week. This represents an increase of 44 percent from last year's successful attack experience.

Another problem identified in the CSI/FBI report (2011) is that the information security community right now is not that the current news isn't fairly good. They argue that in fact it is—but that the advanced attacks we don't see much of right now, should they become prevalent, will render many of our defenses moot. Further, cloud computing increases vulnerability as it blurs the locality of data and running processes. No doubt dependency on technology makes organizations more vulnerable to threats occur mainly from within.

While examining vulnerabilities, there seem to be a gap between the use of technology and the understanding its implications inherent in its use by the employees in general (Dhillon, 2000, Kesar 2005). This also perhaps explains why figures representing the number of information systems within organizations that have been successfully penetrated without detection are startling (for example, see CSI/FBI 2011).

Efforts to manage vulnerabilities: The CSI/FBI surveys always take a special interest to examine how many respondents information security awareness training as a non-technical way when addressing some of the most common vulnerabilities. Their recent report (2011) shows that one hand, it seems only logical that educating employees would prevent problems such as poor password. But while training programs abound, it is difficult and hard to prove that they actually accomplish anything and harder even than that to describe what the effect might be in quantitative terms. The report reflects that only 14.9 percent of respondents reported that their organizations had no awareness training. Approximately 40.8 percent last year said that they have a program but don't measure its effective, which dropped to 34.1 percent in 2011 survey.

In the report "Statistics and the cybercrime epidemic report", Gady[4] points out there is a significant disconnect within many businesses "where internal security experts are unable to justify increased security methods or spending due to a lack of measured information, presents a grave danger to the well-being of our global economy". He believes that having trusted measures and performance benchmarks will significantly reduce this information gap between security and executive leadership in organizations. This in turn, will help formulate more cost effective defense strategies against computer crime. Consequently, better detection rates of attacks, faster responses to incidents, and sounder policy formulations will make companies more secure and consequently more competitive in the global market.

To manage vulnerabilities related to information technology in their paper, Sharma et al (2008) recommend:

- Effectively deal with insider threats;
- Establish good management practices so that internal employees do not get a chance to subvert internal controls. Also establish normative controls in line with the cultural context;
- Establish a security policy that reflects the organizational context in which it is implemented;
- Establish clear structures of responsibility;
- Inculcate a security culture, where responsibility, integrity, trust, ethicality are considered important;
- Focusing solely on rules will not be of help in the changing business scenarios (such as of today), because they do not apply to unpredictable circumstances.

[3] See http://www.hpenterprisesecurity.com/collateral/report/2011_Cost_of_Cyber_Crime_Study_August.pdf

[4] See http://www.ewi.info/statistics-and-cyber-crime-epidemic

Discussion so far, strengthens the argument focus only on technical measures, seems to be the main focus within organizations, which can provide only a partial solution when dealing with computer crime.

2.3 Assumption

Increasing sophistication of employees and the kind of information required for 'success' of a business today implies that it is no longer possible to maintain effective security by technical controls (see Audit Commission 2005). This is because researchers and practitioners comment that opportunities for computer crime within organizations may well be spread within an organization where different responses arise from work pressures and working conditions conducive to computer crime (Kesar 2005). Therefore, such crimes are dependent on organizations creating a climate that perhaps provides potential offenders with 'suitable opportunities' to readily misappropriate computer systems (for example, CSI/FBI 2005; Kesar 2005). Such 'suitable opportunities' are mainly created through inadequate and/or lack of understanding of basic security policies and procedures (Audit Commission, 2005). No doubt, different jobs provide a different "illegitimate opportunity structure' within organizations for employees to exploit.

Few researchers in their studies echo the claim that computer crime is predominantly the result of disregard for basic information security. Hence, equal importance to formal, technical and informal controls should be given (Kesar, 2005). Formal controls within organizations relate to physical access controls, systems development, maintenance controls, changing of passwords, library controls, and system performance measurement aids. These controls play a prominent role in the management of computer crime. This is because such controls are not mandated by law or by any external commission or government bodies but it is the responsibility of the management to define, administer, monitor and enforce controls on employees. Whereas, informal controls can be within a system, which is dynamic in nature and where people have capacity to meet changing circumstances. Indeed, by sustaining informal systems, organizations can respond to computer crime threats that may occur from within. Thus, people working in an informal system within organizations have the adaptability and flexibility to recognize new conditions (Liebenau and Backhouse, 1990). Both formal and informal controls are important systems because the characteristics of an organization cannot simply be represented by formalized rules.

Safeguards to minimizing computer crime within organizations, researchers have used the general deterrence theory from criminology to predict the use of deterrent security countermeasures (for security polices and guidelines, security awareness programs and preventative security software). Information systems researchers have relied on deterrence theory, which although useful, has been recently criticized for its limitations (see D'Arcy and Hovav 2004). Mattis (2011), as mentioned above, uses learning awareness theory to indicate that people within organizations need to become aware through their own or group evaluations of their behavior that they are acting inconsistently and/or unfairly. Efforts to manage this vulnerability (computer crime) vary, depending on the employees' action. Here awareness via training can play a significant role in changing "mindset" about not only management of such crimes but also employees attitude about the consequences of such crime. It is important that, as the feedback loops indicate, those who actively inquire into and reflect on their actions tend to learn (acquire new actions) and to help to minimize the "suitable opportunities" available within organizations leading to occurrence of computer crime. Hence, TTL framework can draw attention to the integration of organizational behavior, actions into management, operational and technical controls in the context of management of computer crime.

2.4 Context

Earlier work in information security was dealt with under a broader term of 'Computer Security', which was primarily developed for the US military. Such measures catered more for structures context that were hierarchical where they had centralized information processing. The structures and how information is processed within organizations today is different. Today, organizations are much flatter

structures of government and more autonomy and delegated financial powers to employees exist today. This may be commercially efficient but increased flexibility improves the chances of 'suitable opportunities' to commit cybercrime within organizations. Although, it is hard to achieve a 'completely' safe working environment since technology is constantly changing, it is clear that technical controls alone will not be enough to combat cybercrime in a *transforming* business context.

In light of the above discussion, what organization relate to "effective measures" need to be revised. Triple loop learning framework provides a strong framework to reflect on a different perspective that takes into account various factors necessary to examine while addressing the increasing problem of computer crime within organizations. Gorden et al (2004), for example, adapted Cohen and Felson's Routine Activities Theory, which stresses when understanding crime in general, suitable target, a lack of capable guardians, and a motivated offender needs to be considered. In their interpretation, computer crime is the result of offenders "…perceiving opportunities to invade computer systems to achieve criminal ends or use computers as instruments of crime, betting that the 'guardians' do not possess the means or knowledge to prevent or detect criminal acts." (Gordon et al, 2004).

3. Conclusion

It is clear that equal consideration of technical, formal and informal controls need to be taken into account while managing computer crime. In other words, mere implementation of state-of-art technical mechanisms as part of managing computer crime will not alone be adequate in minimizing 'suitable opportunities' for employees to commit such acts. To conclude, this paper contributes to provide a rich theoretical perspective to understand management of computer crime by using TLL, to "shift" our understanding about the very nature of the problem. This, itself is the first step in minimizing the increasing problem of computer crime within organizations.

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FROM SEAFARING PROFESSIONALS TO IT PROFESSIONALS

Kai Kimppa and Norberto Patrignani

Abstract

This is a story telling session with no written paper associated. It opens with an introduction covering the use of fiction and readings from fictional short stories. An indication of the progress made in this work will be given. This is followed by a series of readings. There will is an opportunity to discuss this work afterwards.

PROBLEMS IN THE USE OF PERSONAL INFORMATION FROM THE POINT OF VIEW OF RELATIONSHIP MARKETING

Hiroshi Koga

Abstract

The purpose of this paper is to verify the marketing paradigm for utilizing the purchase history data of the customer from the viewpoint of personal information.

To that end, this paper is organized as follows. First, the author reveals the significance of the marketing paradigm, which is based on the use of purchase history data and argues about the pitfall of the new marketing paradigm. Second, the concept of privacy/personal data is re-examined and it is discussed that the right of self-information control accelerate the trap of relationship marketing. Finally, it points out that the re-orientation of a privacy concept is required in order to conquer the pitfall of relationship marketing.

Keywords

Personal information, Privacy, Customer Relationship

1. Introduction

Recently, acquisition of individual purchase history data can be acquired by combining RFID (radio frequency identification) devices and POS (point of sales) system. RFID devices provide personal data of customer. POS system provides when and what items customer bought and how many items they bought. As a result, effective and efficient merchandising based on individual purchase history data can be realized now. Then, the capability of data handling has come to be recognized to be a source of a sustainable competitive advantage nowadays.

Furthermore, it is said that the data driven marketing strategy (relationship marketing) can build the win-win relation between a customer and a seller. The customer can enjoy various services instead of offering their personal information.

However, there are some pitfalls in relationship marketing.

Especially the confusion involving the concept of relationship is considered to lead the misuse of data. And this confusion is not unrelated to the personal information concept which recent years extend: for example, form the right of leave me alone to the right of self-control. That is, it can be said that conceptual extension of personal information is promoting misunderstanding of the concept of relationship.

Then, I would like to verify the marketing paradigm for using a customer's purchase history data from a viewpoint of personal information in this paper. Therefore, the research question of this paper is twofold: First, is the prevention factor of personal purchase history data confusion of a concept of relationship? Second, is misunderstanding of personal information promoting confusion of a dealings concept?

And, the composition of this paper is as follows.

First, the author reveals the significance of the marketing paradigm, which is based on the use of purchase history data and argues about the pitfall of the new marketing paradigm. Second, the concept of privacy/personal data is re-examined and it is discussed that the right of self-information control accelerate the trap of relationship marketing. Finally, it points out that the re-orientation of a privacy concept is required in order to conquer the pitfall of relationship marketing.

2. Reconsideration of relationship marketing

First, the author reveals the significance of the marketing paradigm, which is based on the use of purchase history data. In other words, the significance of relationship marketing is considered. Next, the pitfalls of relationship marketing are pointed out.

2.1 The essence of the concept of relationship marketing

The feature of relationship marketing is meaning not new customer acquisition but the existing customer maintenance. Therefore, unlike the existing marketing, not the investigation and the plan before sale but after marketing becomes a core. In other words, the feature of relationship marketing is taking notice of the long-term dealings instead of a spot transaction. Therefore, relationship marketing will aim at acquisition of the customer share instead of the market share in a certain time.

Then, what kind of concept is a customer share? In this section, I would like to explain the concept of a customer share by considering the difference with a market share (e.g. Peppers and Rogers, 1993). A market share will be a concept which observes for "whether gaining what percentage of the overall market at a certain time", if it says simply. And by traditional mass marketing, the goal is to gain the top of a market share (Number One). Then, in the conventional mass marketing, a customer is considered as "an object which should be gained" and is recognized as a "mass" and/or an aggregate.

On the other hand, a customer share is a view which aims at not top market share (number one) but the only one for a customer. Here, the share of customer is the percentage of product of a company that a customer purchases in such product category. Then, the loyalty covering one customer's whole life is observed. That is, it is a view which aims at the construction of business connections covering the whole life. As a result, a customer will be recognized as "a partner who should build a confidential relation."

For example, in the case of the customer who purchased the new car of 20,000 dollars, a business opportunity does not necessarily finish at the time of purchase. It is because various business opportunities, such as a change of an interior change, part exchange, an insurance contract, and a car and an additional purchase, are expectable. If an example is taken in such an opportunity, the price of the profits obtained from the customer who purchased the new car is not only 2 million yen of the price for a new car. The several times including related consumption are expectable (Swell and Brown, 1990). Such "an amount of money (value) which a regular customer purchases through the whole life" is called LTV: life time value (Blattberg, Getz and Thomas 2001). Therefore, acquisition of a customer share is exactly aiming at maximization of LTV.

The essence of relationship marketing is developing the individual marketing correspondence according to every customer's purchase history data and individual attribute data. Table 1 shows the difference of relationship marketing and traditional mass marketing.

Table.1. difference of relationship marketing and traditional mass marketing

	Mass marketing	Relationship marketing
Scale	Market share	Customer share, LTV
Time-axis	Short-term	Long-term
Positioning of its company	Number one (top share)	Only one
Main sources of data	Market research	ID-POS: purchase history
A customer's positioning	target	Partner

Then, relationship marketing consists of five steps: first, to identify the individual customer from membership card and so on; Second, to accumulate and store individual purchase history in chronological order; Third, to analyse personal tendencies and values and identify the profitable customer; Forth, to implement measures to deter customer defection using customer database (specifically, enforcement of FSP: frequent shoppers program); Fifth, to implement the rank-up program for customers.

2.2 The pitfalls of relationship marketing

Next, the pitfalls of relationship marketing are pointed out.

Originally, relationship marketing is an idea to focus on the good customers. Here, a good customer refers to a person with little cost to the acquisition and maintenance. And, a good customer is also a high customer of LTV. Furthermore, a good customer's loyalty is very high. However, concentrating on a good customer has a risk of reducing LTV as a result. It is a pitfall of relationship marketing. Such a pitfall can be typified as follows (Koga, 2001).

The first trap is relapsing into mass marketing by introducing surface FSP (Newell, 2000). FSP has a risk of collecting the cherry pickers which consider a point card like a discount ticket. Then, it is difficult to build a long-term relation.

The second trap is keeping all the customers as an object of ranking up. Then, customer maintenance cost increases on the contrary (e.g. Slywoltzky and Morrison, 1997).

The third trap is failing to gain a next-generation good customer by carrying out superfluous adaptation to the existing customer (Christensen, 1997).

An important thing is screen the customers. However, there are some companies that try to maintain a relationship with all customers, without focus.

Then such a trap is discussed from the viewpoint of personal/privacy data. Therefore, the following section examines the concept of personal/privacy data.

3. Impact of the conceptual extension of privacy to relationship marketing

In this section, the concept of personal information is re-examined and it is discussed that the right of self-information control accelerate the trap of relationship marketing.

3.1 Examination of the concept of personal/privacy data

The early concept of privacy was introduced as the right of "leave me alone" and as the non-property rights. However, the concept of privacy has been changed to the right of "self-control." Proposal of such "a right of self-information control" can be understood to be extension of privacy space (the intimate area). According to the concept of the right of self-information control, even the mechanical information (e.g. name, gender, a birth date, a telephone number, a zip code and so on) to which nuance differs from the information about a private life comes to be included in the object of privacy. Such data is the information on condition of public presentation like class list of names. Moreover, it can be called the information which has a meaning only after is released. Nevertheless, such personal data has come to be recognized as an object of the right of self-information control. And the state of "overprotection of personal data" arose as a result (Aaoyagi, 2006).

As a result, the concept of privacy is now considered valuable something, in other words, as property right. There is paradox that privacy is treated as a property right despite introduction as a non-property right.

Then, personal identification data is "a material of business" and came to have a "monetary value." And since the personal data is equipped with multiplex availability, it can repeat dealing. Therefore, the logic that it not only will restrain commercial use of the personal data by a third party, but it will deal in own personal data has arisen.

3.2 The conceptual extension of privacy and relationship marketing

Just like privacy, purchase history data has become subject to self-control as a property right. Then, some consumers began to think that their own purchase history data should be sold to company.

It is the appearance of permission marketing (Godin, 1999). Here, permission marketing is the marketing approach that a rebate check and the point of FSP will be given, instead of permitting offer

of personal data. So to speak, it is the logic of carrying out the equivalent exchange of the various service elements to personal information.

However, the idea of asking for consideration of personal data promotes the above-mentioned the pitfall of relationship marketing.

The object of FSP will be extended in order to acquire as many valuable individual data as possible. Once, it is the same failure as enclosure of the customer by the exclusive EOS terminal of original specification. The customer simply surrounded by many terminals, but was not necessarily enclosed by the specific retailer. Similarly, consumers joined much FSP and only used the card in accordance with the bargain sale. It is the first trap.

Furthermore, the logic of an equivalent exchange has a high risk of becoming a prevention factor of building a long-term relation. In order to focus on whether or not commensurate with consideration, the logic of the exchange of equivalents tends to fall into a very short-term perspective.

Of course, if it compares with conventional “interruption marketing; which send a message that many and unspecified customers do not have permission in one way”, permission marketing will tend to obtain customer satisfaction. And although it is “a short-term transaction which is reset each time”, if it is advantageous conditions, “repetitive dealings and long-term relations" can be built.

However, customers such are the price-sensitive people. In extreme cases, they are a cherry picker. They have more than one membership card for discounts. In other words, they are a people of the lowest LTV. And the worst problem is that the customer was becoming to seek in return to provide enterprises with purchase history data. In this way, the concept of self-control of purchase history data tends to disable relationship marketing. Then, it is forced to approach potential customers who will be bad for a one-time transaction.This is the second trip of relationship marketing as above mentioned.

And, when targeted at a price-conscious customer, the risk of overlooking a next-generation superior customer is high. This is the third trap.

As mentioned above, when the view of self-controlling own personal/privacy data as property attains to own purchase history data, a risk of falling into the trap of relationship marketing becomes high. This is the reason extension of a privacy concept promotes prevention of relationship marketing.

4. Overcome the pitfall of relationship marketing

In this section, the concept of relationship that maximizes customer share - the goals of relationship marketing - will be discussed.

4.1 Two contrastive concept of relationship

Then, the relationship is classified into two types. That is, the economic relations and mutually (or reciprocal) beneficial relationship.

Opponent of economic relations is the customers who treat their own purchase history data as property right. Such a customer in economic relation is not what is called a good customer in that s/he focuses to only a short-term and economical relation as mentioned above. Therefore, economic relations inhibit to maximize customer share.

On the other hand, the subject of mutually beneficial relationship is the customers who willing to provide purchase history data. It characterizes as an attitude of receiving better service by disclosing personal/privacy data positively. There is no nuance called a calculating equivalent exchange.

By the way, we may feel the invasion of privacy to DM or telemarketing sales call. It is because it thinks that DM and sales call interrupt between a customer's private space-time. As a result, it is suspected where my personal/privacy data was got to know from - Here is the reason permission marketing attracted attention. However, in mutually beneficial relationship, Personal information serves as a gift which does not calculate a consideration (or price). Such a customer would become the special guest that the company has memorized its name. So, the mutually beneficial relationship promotes to maximize customer share. Therefore, prescription for mutually relationships is proposed.

4.2 Re-orientation of personal/privacy data

If repeatedly emphasize, the author considers that economic relations of personal/privacy data is not appropriate. That is, such a relationship, buyers (customer) sell the privacy of his/her own and sellers (retailer) discount the amount of privacy as consideration, is not healthy in term of relationship marketing.

By the way, in the past, the advent of new intermediaries to act for transaction of purchase history and personal information has been pointed out. It is named as information intermediaries (Hagel III and Singer, 1991). Then, behind the concept of an information intermediary, I could see the idea of buying and selling such as personal/privacy data and purchase history data. In other words, the information brokers are none other than the agency business of pricing privacy. However, the concept of agency is incompatible with reciprocity relations. In other word, I understand that information intermediaries (or information brokers) was promoting only economic relations. Furthermore, unfortunately, the conventional information intermediary is not to help in building a relationship of reciprocity. For this reason, the appearance of an actor that is different from the information intermediary is expected. In order to build the relationship so as to provide consumer information is willing to the seller, information intermediary just is not enough. Here, the key is the concept of donation contrasting with the exchange market, in the other word, gift. Such a concept of relationship is referred to mutually beneficial relationship.

Then, adopting the concept of gift and/or mutually beneficial relationship requires the re-orientation of personal/privacy data which it continues extending. In the gift, people do not expect something in return. And, in the gift, personal/privacy data is not to use like coupons. Rather, the customer can receive gift from the company by offering spontaneously related privacy. That is, privacy has the character in which new value can be received by opening and exchanging to retailer. And, such new value can be called experience without the substitute for a customer. Then value amplifies experience by being told. It is exactly buzz marketing.

As when telling their experiences, it is to convey the details of the profile and actions. So to speak, it is the marketing of storytelling. To construct such a relationship, the seller must provide experience (or value) such that buyers want to the storytelling. So, the conclusion of this paper is that the key to leverage personal information and privacy is the narrative in the experience economy.

5. Conclusion

In this paper, the pitfall of relationship marketing was pointed out and the author clearly that extension of the concept of privacy would be deeply concerned behind a pitfall. The view of the right of self-control of personal/privacy data as property rights orients to the equivalent exchange of personal/privacy data and various services. Then, it would become the same as the mass marketing instead of the relationship marketing which aims at individual correspondence. In order to avoid such a paradoxical phenomenon, it would be necessary to adopt the dealings concept which should be called mutually beneficial relationship instead of an equivalent exchange. It is necessary to re- realize it as the material which produces new value by exhibiting and exchanging a privacy concept for conversion of such the way of thinking.

By the way, in recent years, the argument involving a privacy concept has greeted a new aspect of affairs. It is an argument that the right to be forgotten and the right to data portability. If it sees from the position of the narrative in the experience economy, such a concept of privacy can be understood as an opinion of disliking relating with the context which was un-intended by customer her/himself. Therefore, it is thought that the narrative in the experience economy is putting a new privacy concept into a range. However, I would like to consider it as a future subject about this problem.

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MISSED CHANCES AND WRONG CHOICES IN PATIENT INFORMATION? AN ETHICAL EVALUATION OF THE FINNISH IMPLEMENTATION OF THE EU DATABASE DIRECTIVE

Jani Koskinen and Ville Kainu

Abstract

Patient information is a critical instrument in modern healthcare. The different interest groups involved in health care hold an interest for patient information. As the interests of these groups are to a degree mutually exclusive, the *de jure* status of patient information is of vital importance. Problematically, the Finnish legislation regulating patient information is, as this paper shows, neither clear nor does it meet the demands of efficiency or ethicality.

As ethics hold a critical position in determining the justified owner of patient information, the legislative solution to the different interests ought to be ethically well justified. This paper argues that an ethically acceptable formulation of ownership, if passed into law, prevent the harmful effects of unethical use of patient information. A strong philosophical understanding of patient information is necessary to judge whether the legislative solution is reasonable or not.

This paper presents some arguments from Locke and Kant, which point out problems in directive 96/9/EC, the so-called database directive, and in particular its Finnish implementation as regards patient information databases. This paper concludes that citizens should be the owners of their own patient information, in the sense of *datenherrschaft*, to meet the demands of ethicality.

Keywords

EU Database Directive, Ethics, Patient information, Datenherrschaft, Locke, Kant

1. Introduction

Hettinger states that "Property institutions fundamentally shape a society. These legal relations between individuals, different sorts of objects, and the state are not easy to justify. This is especially true of intellectual property". (Hettinger 1989.) The case of patient information ownership is not easier even though the area is narrower when compared with the overall area of intellectual property. Some of the fundamental demands and values in healthcare are not similar to those in general IPR (intellectual property rights) expectations elsewhere. Therefore, it is obvious that in healthcare context ethics has great importance and thus proper arguments are needed for justification of patient information ownership.

This paper argues that ethical demands would be better served by clearly defined rules governing patient information and patient information databases. We need a clearer, re-defined concept of ownership compared to the prevailing situation. European Union Directive 96/9/EC directs member states to implement a law granting a *sui generis* protection to databases of facts to those who create said databases. This protection is remarkably similar to copyright in that it encompasses the exclusive right to use the database for financial gain. This paper starts by using the IPR sense of the word 'ownership,' as both the factual phenomenon and the suggested solution work with said definition. It is obvious that the concept of "ownership" is complex and that the current definition of "ownership'" must be re-defined.

Current legal situation remains complicated, because legal precedents for IPR-protecting patient information are difficult to find. While the Finnish Copyright Act (404/1961) 40 b § grants ownership of the database containing e.g. patient information to the complier of the database, the decree given by the Finnish ministry of social affairs and health on 30.3.2009/298 limits the use of patient information to only that which is necessary. The ownership is not stated clearly enough, which is problematic. In

other jurisdictions, for example in the United States, there are organizations that buy patient records and make a profit by selling them. In many US states, patient records are treated as physical property of the hospitals and physicians. At the same time, citizens have a right to patient information that concerns them. (Rodwin 2009, 2010.) Ultimately, whoever owns the patient information (in this case, the patient information databases), can decide the uses to which it will be put.

As Grcic (1986) said "A moral right is a valid claim justified by reference to some moral principle". Hence, what kind of ownership of patient information would be good and ethically justified must be considered first. Then the arguments for a viable legislative solution and definitions of health care practices (which fall outside this paper's scope due to limitations of space) can be brought forward. The aim is to implement the philosophical basis and have greater moral legitimacy in health care.

This paper argues that the ownership of this IPR should be granted to the citizen on two main grounds: first, that the integration of patient information would be a natural outcome and secondly, that this solution would be ethically superior to the current legislative solution. This paper begins with an ethical evaluation of the five alternatives for ownership of patient information: the state, the healthcare worker, the healthcare provider organization (public or private), the provider of database and finally the citizen. This paper argues that the citizen has the best ethical claims to ownership of their own information. Critical arguments from Locke (commonly used in IPR discussion) and Kant show that citizen is the most justified owner of patient information and cannot be bypassed.

2. Ownership

First problem while analysing the ownership is that the term ownership itself is multidimensional. It has historical aspects, even the philosophers of history such Plato and Aristotle has taken it under consideration and not forgetting countless other philosophers from that time to current day. Ownership has also different manifestations which are dependent of the shape of object which is seen to be owned. Property can be physical objects, land, intellectual property, money (real or numerical credit of account) etc. Therefore, in this paper the premise and focus is on immaterial property. The choice is valid because obviously immaterial nature of patient information even it can be stored and become concrete through the physical objects as papers and different information systems. However, the definition as intellectual property is not accepted as it is commonly used in status quo IPR-legislation. Reason for this demarcation is that when usually granting ownership the intellectual work or act is seen as sufficient justification for ownership, which is seen problematic based on arguments presented in this paper. On chapter three there is presented the substitutive solution of ownership: datenherrschaft of citizen.

Patient information is fundamentally different when compared other immaterial (intellectual) property. Even creator of patient information can be, and usually is, healthcare professional the mechanism of that creation is exceptional. Whilst traditional intellectual process like artistic composition can be made solely by creator, situation is not equivalent when creating patient information. The fundamental source of information about patient is the patient not healthcare professional. Healthcare professional is actually not doing no more than diagnosis, especially when the modern healthcare rests on evidence based medicine. Hence, diagnosis cannot be done without the patient.

2.1 De jure ownership of patient information

Traditionally, the critical element necessary for granting copyright protection has been that there is a 'work' to protect. With the directive 96/9/EC the European Union directed the member states to implement a *sui generis* protection for all databases and copyright protection for databases that "by reason of the selection or arrangement of their contents, constitute the author's own intellectual creation shall be protected as such by copyright. No other criteria shall be applied to determine their eligibility for that protection." Finland implemented this directive via Finnish Copyright Act (404/1961) (hereinafter FCA) 40 b §.

"If a computer program … is created in carrying out the employees work duties, the copyright passes to the employer … this provision shall apply to databases created in carrying out work duties or official duties" [translation here]

To explicate, the FCA 40 b § grants ownership of the database containing e.g. patient information to the complier of the database, or, if the compiler is an employee, to the employer in whose service the database is complied. Note that the Finnish implementation grants higher level of IPR protection than the directive intended.

The European Court of Judgement (hereinafter ECJ) has given several decisions regarding this directive. In case C-444/02 *Fixtures Marketing* [2004] ECR I-10549, paragraphs 33 to 36, ECJ states that a database listing basic information enjoys the *sui generis* protection. However, in case C-604/10 *Football Dataco and Others* (not yet published) paragraph 27 ECJ states that copyright and the *sui generis* right are two separate rights. In paragraph 36 to 40 the ECJ states that, in order to enjoy copyright protection, the author must express his creative ability in setting up the database by making free and creative choices.

It seems highly questionable that an electronic equivalent of a paper patient record could be set up following a set of free and creative choices. Rather, it seems that there is very little room for choices. The basic biometric information is not optional, and fields for diagnoses and medication seem equally mandatory. As an aside, the skill and labour necessary to create the data are irrelevant to the question of the databases' copyright (ECJ C-604/10 *Football Dataco and Others* paragraph 46).

An electronic patient record would hardly seem to qualify for copyright protection under the ECJ interpretation of the database directive. In paragraph 52 of *Football Dataco and Others*, the ECJ explicitly states that member states *may not* grant copyright protection to databases under *any other* conditions than those set out in Article 3(1) of the database directive. *Thus, the Finnish implementation of database directive has failed critically as it makes no differentiation between the sui generis right and copyright and extends copyright protection to all databases created in an employee-employer relationship.* There is, as of this writing, no pending revision of the FCA 40 b §.

Under the Finnish law, then, a patient cannot be the owner of his or her own patient information. The information is compiled into a database and the provider of health care (regardless of whether this provider is a public authority or a private health care provider) gains the rights to this information.

Provider of patient information database is the controller of database and contents of it. Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases gives sui generis protection for all databases. The explicit reasoning behind the directive is to compete with the USA in database-based enterprise

2.2 Right to verify personal information in a database and exercise of this right

Despite the lack of ownership, a citizen has on basis of the Finnish Personal Data Act (523/1999) (hereinafter PDA) an unwaiveable right to know their personal data is being stored in a registry (PDA 24 §), check the accuracy (PDA 26 §) and correct (PDA 29 §) any data concerning themselves.

However, there is no law does guaranteeing that the exercise of this right should be free of charge. Accessing the different databases that are maintained by public authorities incurs a cost. The Finnish electronic handling and manipulation of client data in social and health services act (159/2007) (hereinafter CDA) 18 § states that if the client of social or health services wishes to access the log files documenting accessing of their client data, the service provider has a right to charge an access fee equal to the direct costs incurred by providing access to the log files. By way of analogy, the same applies to the health records themselves.

2.3 Arguments from Locke

Intellectual property is commonly justified with Locke's notions about property gained by labour (see e.g. Hughes 1988, Spinello 2003). Locke's (TTG II, V, 27) argument "*Though the earth, and all inferior creatures, be common to all men, yet every man has a property in his own person: this nobody*

has any right to but himself. The labour of his body, and the work of his hands, we may say, are properly his." seems *prima facie* plausible, but within even little deeper evaluation it is seen that it fits only for physical property. Kimppa (2005) has argued that Locke's argument is valid only if the ownership is exclusionary; meaning that if someone else owns something and it is away from another, for example food, drink, cars or other material objects. But information is not away from anyone else. Thereby Locke's argument about property is not valid when considering the immaterial because the limiting factors of property over peoples life and liberty**.** Thus, we must reject the provider/complier of patient information database to be owners of information based on intellectual process. Same argument is valid when considering that healthcare workers or healthcare organizations to be owners based on labour.

Another problem is that if some other party, than citizen, owns (controls it) of patient information, what are the rights of the citizens? If someone else than the citizens themselves have ownership of the patient information, people's rights for information concerning them are actually restricted and thus their liberty and autonomy are restricted. This idea of someone else than the citizens themselves controlling the patient information is problematic because Locke's (TTG II, VII, 87) statement

"Man being born, as has been proved, with a title to perfect freedom, and an uncontrolled enjoyment of all the rights and privileges of the law of nature, equally with any other man, or number of men in the world, hath by nature a power, not only to preserve his property, that is, his life, liberty and estate, against the injuries and attempts of other men…"

The statement points that we cannot use Locke as justification if we lessen people's liberty and autonomy. At the other hand, when citizen own their patient information the liberty and autonomy of people is actually strengthened because they have more control, and thereby possibilities, to use that information as they wish.

Worth of notion is also that if one owns one's body, how can it be that some other party has rights over information about the body of the person and the person does not? Yet, more crucial is how someone can have rights over my *person*, which nowadays could be defined as an individual person. If there is an individual person, the health information about that person is basically private by nature when thinking about Locke's (TTG II, V, 27) view about a person. Therefore, the idea of someone else than the patient as the owner conflicts with Locke's idea about a *pers*on and thus cannot be justified because the health/patient information can be crucial for one's understanding about life and body of their own.

2.3 Arguments from Kant

Justification that someone else than citizen should be owner of patient information could not be found from Locke. Aforementioned problems in patient rights and Locke's view of property leads us towards the philosophy of Kant (1785) and his three categorical imperatives, which all are modifications of same moral law but differently presented:

1. Act as though the maxim of your action were to become, through your will, a universal law of nature
2. Act in such a way as to treat humanity, whether in your own person or in that of anyone else, always as an end and never merely as a means.
3. Act only so that your will could regard itself as giving universal law through its maxim.

Kant's categorical imperative's second formulation states: "Act in such a way as to treat humanity, whether in your own person or in that of anyone else, always as an end and never merely as a means." (Kant 1785). Thus, the person should always be treated with respect to his or her humanity, not in an arbitrary fashion. Each person should be honoured because he or she is a human being, not because he or she is something which serves some personal end or goal. (Liddel 1970.) Therefore, the citizen cannot be bypassed when thinking about patient information; for if they are, people are treated as means only.

Restoring the citizen's health or curing a disease is not sufficiently fulfilling the Kantian second formula. People can be treated as an object by healthcare and healthcare professional while they are

having care or medical treatments. This point is valid in situations where an owner of patient information is to be a healthcare professional, a healthcare organization, a provider of a patient information database or a state. If some aforementioned owner candidates (other than citizen) of patient information is granted the ownership, the patient as human being is not honoured as an end per se. Accordingly, if the patient is laid aside compared with other owner candidates, which have their own goals (even those goals can be same as goals of citizens), we do not respect people's autonomy and liberty to choose how information is used or is not used.

Example, people are not treated as an end, if healthcare professionals owns the patient information and thus have a paternalistic state over citizen. In paternalistic relation, healthcare professional can decide how the information is used and what is best for the citizen. Thus, there the citizen's humanity as a being person who has his or her own will and opinions about his or her life is lost by someone else's power over the citizen. There is loss of the person ahead in that paternalistic way of good intentions. It is obvious that if owner is some institution (state, healthcare organization or company) the problem is actually worse, institutions can treat citizen only as part of bureaucracy process, without trace of humanity.

The first categorical imperative, "Act as though the maxim of your action were to become, through your will, a universal law of nature" gives more to think about. A wider understanding and the bigger picture about ownership must be reached rather than solve some specific situation if the first categorical imperative is to intend to be fulfilled. The defined ownership of patient information should be formulated and legislated such way that it satisfies requirements to be a universal law. In this context that means that ownership must be formulated so that every rational being could apply that regulation. Taylor (2004) has analyzed the paternalistic maxim and came to a conclusion that it is not acceptable people are treated paternalistic way. If the world, where paternalism as a maxim is universal law, is imagined there would be situation where people could not be in self-control. Paternalism maxim converts rational agents to be less autonomous and diminishing the capacity for their self-control, which is a precondition for possibility to actually will effectively any action at all. Thus, by willing the paternalistic maxim to be universal law one takes away this capacity which makes that willing to be collision within itself. Thereby paternalism cannot be held as a universal law.

The first categorical imperative clearly brings out the flaw if the citizen is without the ownership of own patient information. If some other party is an owner of patient information, there are aforementioned problems with the paternalism, in this context some others power over citizen considering patient information. Thus, that solution where a citizen is not an owner cannot be a universal law because of the aforementioned problems of paternalism.

The third categorical imperative can be used to test if some action is ethical or not. In this paper, proposal that a citizen should be an owner is presented. If that solution is looked through the third categorical imperative, it is seen that some constraint on that ownership must be acknowledged. Even it is argued that citizens cannot be displaced from an owner position without problems; either cannot the citizen's ownership be absolute over the patient information. There are occasions where the healthcare professionals or other authorities must have access to the patient information. Example, there is situations like lethal epidemic diseases or situations where access to the patient information is crucial for some other individual. In any case, information in some situations is premise for securing other lives and withholding that information hence cannot be seen as an act of universal law through its maxim. Nevertheless, this collision of patient rights and urgent need of others can be solved with giving criteria when patient information can be accessed without the permission of an owner (citizen). Citizens can, of course, give rights to access on patient information in all medical issues which makes the problem to disappear. But that consent must be informed and done by the citizen. That way regulated ownership seems to be acceptable by all three categorical imperatives and overtakes the aforementioned problems which came up if someone else was considered to be an owner rather than the patient.

2.4 Datenherrschaft as an solution of the ownership

Kainu and Koskinen(2012) presented the definition of *Datenherrschaft*, which needs redefining for it to be more applicable for patient information context:

"the legal right to decide the uses of, in a database or another compilation, collection or other container or form of data, over a entry, data point or points or any other expression or form of information that an entity has, regardless of whether they possess said information, with the assumption that sufficient access to justice is implemented for a citizen to have this power upheld in a court of law."

In this context, a restriction is appended. As patient information can be critical in limiting the impact of epidemics, the citizen may not destroy information in patient information database. The public health care may, in carefully delineated circumstances, utilize this information to safeguard the health of others. While it may seem that this limitation undermines the scope of *datenherrschaft*, the limitation is necessary. The limited abridgement of *datenherrschaft* is judged a lesser evil compared to the major health impacts epidemics can have. Thus, for the purposes of this paper, *datenherrschaft is* defined as

"the legal right to decide the uses of, in a database or another compilation, collection or other container or form of data, over a entry, data point or points or any other expression or form of information that an entity has, regardless of whether they possess said information, with the assumption that sufficient access to justice is implemented for a citizen to have this power upheld in a court of law, with the limitation that requirements of public health prevent the citizen from having the right to delete information or obstructing the access of public authorities to it when said access is necessary for limiting the impact of epidemics."

3. Conclusions

In this paper it is shown that current legislation of patient information is lacking. As the property interest is financially quite small, there will very likely not be any cases of a citizen appealing to the ECJ, and, therefore, it would be extremely important to take this matter under legislative revision without undue delay. The need for legislative revision is further underlined by the fact that the database directive has been incorrectly implemented. A critical argument exists, based on Locke and Kant, which supports that citizens should be the owners of patient information. *Datenherrschaft* as legal basis fulfils those arguments and emphasizes the status of citizen as person and as an end.

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DEMOCRACY, HUMAN FALLIBILITY, AND ICT

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Abstract
Participation of citizens in matters of policy is important for a well-functioning democracy. Many scholars have suggested deliberative democracy as a suitable model for this. However, concern for groups with weak interest in participating raise some doubt whether this really will be more democratic in the end. In this essay we outline a theoretical model for designing ICT systems so that they stimulate and train democratic dialogue. The model is based on psychological research on decision making and a definition of democracy as a dialectic process, and can be applied to practically any forum where ideas are exchanged.

Keywords
Participative democracy, deliberative democracy, collaborative decision making

1. Introduction

Democracy seems to have become one of those words, along with words like liberty, privacy and justice, that in academia requires definition every time they are used, while they in much of society are understood as the formal frameworks that are created to ensure them; frameworks like separation of powers, protection of personal information, everybody's right to vote and freedom of speech. One would suspect that the real understanding of these terms is either disputed or left vague on purpose, since they are used to address diverse and sometimes conflicting interests. In his 1946 essay Politics and the English language, Orwell voiced a similar suspicion:

"In the case of a word like democracy, not only is there no agreed definition, but the attempt to make one is resisted from all sides. It is almost universally felt that when we call a country democratic we are praising it: consequently the defenders of every kind of regime claim that it is a democracy, and fear that they might have to stop using that word if it were tied down to any one meaning" (Orwell, 1946/2012).

Concerning the image of democracy we will give a few recent examples that serve to suggest that focus on formal democratic rituals without a deeper understanding of their function may lead to issues that are difficult for democrats to handle satisfactorily: In Italy, Beppe Grillo's M5S movement has had electoral success in questioning politics that do not seem to care for the citizens. In Hungary, Viktor Orbán's Fidesz party has gotten parliamentary support for changing the country's democratic constitution under the pretense of protecting traditional family values. In Greece, the authoritarian Golden Dawn is leveraged by discontent with the current system, which is perceived as corrupt. Apparently many voters around Europe do not see that existing democratic institutions serve their interests and seek for alternatives where they can find them. Can this be interpreted as anything but a failure of established politicians to fulfill their role as representatives of the citizens?

The intention of this rant is not to paint a full picture of what democracy means for different people; it serves only to motivate why we in the present essay will assume and try to handle a widespread confusion about means and ends of democracy. We claim that democratic frameworks are not ends in themselves and exist only in order to protect the democratic process, which we will detail further below.

If we would work from a pretense that democracy actually implies public participation in decision making, we might ask ourselves how this has been affected by recent developments in ICT. This is a reasonable question as we can observe the impact of ICT on various societal phenomena. In this essay we will not answer this question but rather propose a theoretical model for how to design ICT systems so that they do support democratic dialogue.

2. Democracy

To investigate the matter of ICT in relation to democracy, we should first present a definition of the latter. We will thus defy Orwell's observation that the term does not easily yield to one particular interpretation. Schmitter and Karl (1991) proposes a fairly non-normative definition for how citizen influence should be guaranteed:

"Modern political democracy is a system of governance in which rulers are held accountable for their actions in the public realm by citizens, acting indirectly through the competition and cooperation of their elected representatives" (p. 76).

In order for this to be realized, the modern democracy has to supply "a variety of competitive processes and channels for the expression of interests and values" (p. 78). This concords with our understanding that democracy is essentially a dialectic process to reach collective decisions that take in account, but not necessarily reproduce, all of the citizens' interests. A democratic society is thus not one in which the majority rules and not one in which a certain set of eternal values are protected, but one in which interests and values of citizens are negotiated and balanced in a reflective process by representatives that can be held accountable for their decisions. Democracy is a rational negotiation process with the aim of achieving solutions to shared problems.

Unfortunately, this is not the only existing definition of democracy. There are many interpretations of what it constitutes and not all of these recognize that it presupposes an acceptance of dissenting ideas. The common sense definition is either result-oriented or focused on formalistic aspects, or both. The first implies that societies that are providing high living standards, security, tolerance, and other goods are called democratic. The second definition is based on the existence of certain procedures, institutions, roles, and processes. The qualities that is commonly seen as constituent of democracy, like separation of powers; equality; elections; freedoms of speech, political expressions and press; etc., are, however, meaningless if there is no public debate (Held, 2006, p. 276); if only the predominant, publicly endorsed ideologies are ever voiced. The fallacy is that presence of formal procedures is sufficient for democracy.

If we rather regard democracy as a process, neither the result of the process nor its superficial formal characteristics should have the highest significance. Democracy does not necessitate specific ideals nor a specific set of rituals. Maintaining and running the democratic process is the most important consideration, which will indeed necessitate the existence of formal procedures, but only as auxiliary to it. In essence, democracy is dialogue between people and this dialogue is what has to be stimulated, supported and protected. Citizens need to be involved in searching for solutions to problems by thinking together with others. This presupposes that each person has a corresponding dialogue with himself or herself and that each person starts from the position that the own thinking can be improved, i.e., become liberated from false beliefs. This is the greatest challenge. Nevertheless, the mindset of each participant in an ideal democratic process, or a dialogue, is such that he or she always feels the need for other participants, simply because he or she is expecting to find a better idea together with other able people (Sen, 1999). Performing this dialogue for this purpose becomes the main consideration, which can be either enhanced or constrained by ICT, depending on how it is designed. We argue that in order to enhance democratic processes, ICT needs to support and stimulate philosophizing: self-critical, systematic, scientific, and holistic thinking, i.e., the Aristotelian virtue of phronesis (Aristotle, 1975) or the Kantian skill of autonomy (Kant, 2006).

Nevertheless, we cannot disregard that dissent can be destructive and even pose a threat to the democracy that embraces it. Recently we have seen worrying trends all over Europe where populist parties are gaining increasing support and influence; resulting in policies that could become threats to principles like equality of individuals. Such tendencies, appealing to self-interests of a voting majority, must be dealt with by stressing the only core principle of democracy, i.e., the open dialogue between all. However, we must not lure ourselves to believe that this is an easy task. Not all are equally well predisposed to deliberating and persuading others in a way that is accepted in the common political discourse (Sanders, 1997). This poses a threat to democracy but ICT can play an important role in making political discussions more accessible to a broad public.

3. Human Fallibility

3.1. The Role of Rhetoric

For good and bad, rhetoric is prevalent in democratic discourse. The positive side is that it can stimulate interest, understanding and engagement but there is also a great risk that they can be used for biasing messages. In the first case we can see that good rhetoric follows the theories of Vygotsky (1962, 1978) and Piaget (1962) by adapting a message to the listener's zone of proximal development, i.e. for pedagogical purposes the message is delivered so that it will fit the recipient's conception of the world. This could be regarded as the declarative purpose of rhetoric. The second case, that of persuasive rhetoric, is arguably more commonplace in politics and serves the purpose of blocking the autonomous thinking of the recipient. This can be interpreted as distrust in the recipient's ability to make the "right" decisions in complex situations but a more modest suggestion is that it is part and parcel of political discourse. In the present text we also use words like "opportunists", "authoritarian" and "sectarian" to describe some movements. We realize that these words are loaded with evaluation but nevertheless we use such descriptions to clarify that we do not endorse the way of thinking of these movements. There are more vivid examples of deliberate use of manipulative phrasing. One that has received public attention is Newt Gingrich's memo from 1996: Language: A Key Mechanism of Control (Information Clearing House, 2013), in which campaign workers are instructed to use certain loaded words about the opposition. However, we believe that it is possible to construct strong arguments without resorting to the use of persuasive language. We will return to this.

3.2. Undemocratic Dialogue

Censoring, Ridiculing, or Ignoring

The greatest threat against democracy is routinized dismissal of dissent. When the discourse becomes biased to regard certain interpretations as true and opposition toward them as false the result is hegemonic dogmatism, which increases the risk of growing silent discontent. One example of this is the rise of xenophobia in Europe. Specifically in Sweden, established political parties for a long time tried to mute the most popular nationalistic (in essence opposed to immigration) party in order to prevent them from getting into congress. This tactic failed and the party entered the congress in 2010 with 5.7% of the cast votes. Recent polls suggest that the party's popularity has increased to around 9%, despite the fact that most news coverage about them has been negative and dismissive. The same pattern can be observed in more totalitarian regimes, where opposition has been suppressed but eventually gained enough traction to lead to revolutions. However, many of such revolutions have lead to new totalitarian regimes, rather than well-functioning democracies. These examples suggest that suppression only works temporarily, whether the purpose is just or unjust. The threat is that when suppression of dissent bursts, there is a great risk that it will lead to rash, unreflected action and adoption of new dogmas and taboos. Under the veil of being a people's movement, dissent against the new order is yet again suppressed.

Misinterpretations

Even though misinterpretation could be addressed in the previous paragraph, we think it deserves a heading of its own. The reason is that it can occur because of two distinct fallacies or, which is most likely, a mixture of the two. The first is deliberate misrepresentation; when a protagonist wishes to efficiently affect popular opinion by rephrasing the antagonist's arguments so that they seem more unsympathetic than they were intended. In its purest form, this type of argumentation fallacy is referred to as straw man. The second fallacy is to fail to understand the gist of an argument and thereby attacking the own misconception of it. This is a communication problem that can happen due to a number of reasons, from differing worldviews and value sets to semantic problems. The latter type of misinterpretation, although sometimes difficult to identify, is not appropriate to classify as undemocratic dialogue but could nevertheless be handled by the same means as the first.

Appeal to Moral Authority

It is impossible to be completely unbiased in the pursuit of moral rights. We need to accept that every argument —even every process— will reflect the values of its advocate. Reflected or not, some values are sometimes regarded as non-negotiable (Baron and Spranca, 1997), which leads to fixed positions. A good example of this type of conflict is attitudes toward abortion.

All of the above taken together suggest that dialogue should probably be focused on creating mutual understanding rather than finding immediate solutions.

3.3. A Mind Set for Democratic Dialogue

The nice dispositions of someone participating in a democratic dialogue that we have assumed above can be challenged if we follow the reasoning of Erich Fromm (2001). According to his logic in The Fear of Freedom, people will voluntarily refrain from independent thinking when facing the uncertainties and unclear responsibilities that follow from unrestricted self-government. Fromm writes that "we have become automatons who live under the illusion of being self-willing individuals" (ibid., p. 218) by which he wants to point out that the ends that we pursue are not necessarily ours but more likely transferred to us by socialization. Humans are social creatures and as such we need a social contexts to guide our pursuits. This naturally poses boundaries for what we want to do and the desires that we have are all reflections of these social contexts. Thus, in face of a pluralistic flood of ideas, we will want to position ourselves where we feel safest, i.e., where we identify our social context to be, and we need to do this in an even firmer way if perceive a threat by an outgroup. A remedy is to train people to reflect together. Sunstein (2002) makes a strong case for allowing group deliberation in homogenous groups, as there is a risk that opinions of marginalized members are suppressed in heterogeneous groups, but he also stresses that in order to avoid polarization, such groups need to be exposed to arguments from a wider pool than what is represented within the group.

We have argued that democracy requires meticulous scrutiny of what is being expressed and that stigmatization and exclusion from public debate has not been successful in suppressing dissent. In the case of the Swedish nationalists, established parties had remarkably difficult to counter their arguments. In the propaganda material, that was sent to many voters but rarely scrutinized by media and other politicians, they exaggerated and misinterpreted statistics and were (and still are) portraying themselves as the only alternative to established dogmas represented by the seven other parties in the parliament. Yet another interpretation of the nationalist's electoral success is that they were allowed to phrase questions in a way that supported their agenda, i.e. something like "how can we deal with the immigration problem?" Rather than scrutinizing the arguments or rephrasing the question, much of the response from the established parties was to dismiss and stigmatize the nationalists as racists, which probably deterred some from voting for the party but at the same time made those who did more committed to the belief that the party is on the citizens' side against the elite. The lack of dialogue has created a sectarian, polarized group, which we believe could have been avoided if dissent had not been denied but instead publicly challenged. We are fully aware that this is not easy. It presupposes great trust in democratic principles and it is also necessary to be prepared to change ones own position in order to achieve constructive dialogue. After all, if voters want change, they will vote for change even if it is not ideal.

The psychological disposition that we are discussing here is that of moral maturity. Jean Piaget (1932) arrived at conclusions about how morality is learnt by observing the attitude that children of different ages have toward the rules of a popular marble game. Premises for this are 1) that ethical systems essentially are rules, and the attitude toward such rules constitutes the essence of morality, and 2) that the children's attitudes toward the marble game represent their moral maturity. "We are in the presence of rules which have been elaborated by the children alone. It is of no moment whether these games strike us as 'moral' or not in their contents" (Piaget 1932, p. 2). What was significant for Piaget was the relation between children's actions and their consciousness of those actions. He noticed that children pass over stages of attitude toward the rules of the game. From infancy to teen the attitude develops. The first step is learning, memorizing and obeying the rules mechanically. Then for a while these are considered to be divine and eternally valid and finally the children arrive at a point when

they realize that the rules are purposeful for the enjoyment of the game and consequently should also be malleable. This final stage, to realize the malleability of rules, is reached only by reflecting on the purpose of the rules, which means the same mental disposition toward technology that is encouraged by e.g. Lawrence Lessig (2006). Lawrence Kohlberg (1985) brought the theories of Piaget to practice and took part in funding schools where students created and managed their own rules in democratic processes. However, there is a fundamental difference between Piaget's and Kohlberg's approaches. While Piaget studied attitudes toward rules, in order to determine children's development, Kohlberg worked from an assumption of what a morally developed individual is. For Piaget the mental processes, revealed by arguments given for certain conduct, were the important aspects, whereas Kohlberg regarded also the conclusions as significant. This has been rightfully questioned as founded on a biased set of values (e.g. Gilligan, 1982). Kavathatzopoulos and Rigas (2006) have later shown that Piaget's theory applies also to adults. People who hold high positions in organizations, who can be assumed to have reflected over and trained decision making under uncertainty, show a more holistic and investigative attitude toward moral rules than the reference group who showed more dogmatism and authority obedience.

4. ICT

When considering democracy as a dialogue between citizens, it is easy to become optimistic about the democratizing potential in so-called social media. However, philosophical and psychological aspects raise some concerns about this. If we wish to understand in what ways ICT affects democratic processes, we need to consider how these appear in light of democratic ideals and modern psychological findings about group decision making. It is necessary to take in account how difficult it is to reach the fundamental reflective equilibrium (phronesis, autonomy). Known psychological mechanisms like group polarization (Sunstein, 2002) make it hard to be unbiased. The way that e.g. Twitter has developed, it is reasonable to at least suspect that it has become a way to position oneself socially and politically (see e.g. Yardi and Boyd, 2010) rather than to spread enlightening information or engaging in dialogue. The 140-word blurbs from people you choose to follow on Twitter may thus, rather than to stimulate deliberation, reinforce a narrow perspective, which runs counter to the ideals of democracy.

Carefully crafted ICT systems could however contribute to a philosophizing process by making information accessible, and by facilitating citizens' participation in political decision making. Such systems can support openness and by that invite people to become more aware and active. Furthermore, they can support horizontal communication among citizens. Issues that are of interest only to few people, or to people that for some reason have difficulties to contact each other by traditional means, may be neglected in the common political process even though they are important. By using ICT, obstacles to connect, inform, and coordinate people's actions can be overcome. Most importantly, ICT can support self-critical and systematic thinking, which is the base for successful democratic dialogue.

4.1. Support Deliberation

A system should refrain from dictating what is right and wrong, since that would necessitate a dogmatic moral standard. Rather it should support a philosophical inquiry and let the moral worth be determined in the process of analysis, as this is dependent on what values are considered. This may seem risky to some, as it gives no guarantees that everyone will agree on the morality of some decision. It is however not enough that a conclusion happens to be in accordance with some moral rule in order to be truly moral. Even a computer, which cannot (yet) be regarded as a moral agent, can follow rules blindly. We furthermore trust societies to comprise mechanisms to define and communicate moral values between its members. A system should consequently be formative and suggest what aspects to consider or how to formulate arguments, but not normative in determining what conclusions are correct.

4.2. Support Construction of Arguments

In an introductory textbook to moral philosophy, Rachels and Rachels (2012) write:

"It would be nice if there were a simple recipe for constructing good arguments and avoiding bad ones. Unfortunately there is not" (Rachels and Rachels, 2012, p. 12).

Despite this claim we will try to suggest a recipe, with the sole intention of making arguments suitable for dialogue. The goodness of the arguments is thus in regard to its form and not its content. Such an argument specifies *who* a certain measure concerns, *why* and *how*. Furthermore, it is explicit about what the *risks* are with measure at the same time as it presents the *possibilities*. Below is an example of such an argument. The formulation of such could be supported by guidance from automated semantic analysis; if significant phrases (italicized below) are missing the system can discretely suggest how to improve the argument.

The possibility to participate anonymously in public debate is *important for citizens because* they can then voice concerns without fear of retribution. *There is a risk* that such channels will be used to spread anti-democratic ideas *but there is also a possibility* that concerns are widely shared and thus necessary to bring to attention *so that* they can be further discussed. ICT systems can be constructed *to stimulate* users *to engage* in constructive dialogue rather than one-directional polemics. *There is a risk* that such systems will limit the possibilities of expression so great discretion is necessary.

4.3. Example System

In order for a computerized system to support democratic dialogue it needs to be designed so that it stimulates the participants to formulate claims so that others can readily assess these. Below we will give one example of a system that is based on the rationale given above.

Collaborative Deliberation

Societies are systems of people and thus societal problems can only be solved by addressing the values and interests of involved people; by answering questions about how these are affecting the problem situation and how these are affected by any proposed solution. The online, collaborative tool ColLab has been developed as a platform for participatory decision making. The tool supplies an open, distributed platform, in which an analysis of situations can evolve organically. It allows different parties to include their points of view and decision makers to follow how arguments have been applied in concrete situations. The central idea is that a tool for decision making should confront the users with how their decisions influence all involved stakeholders and their respective interests (Kavathatzopoulos, 2003). It requires the users to first compile information about the situation, i.e. about the stakeholders, their interests and their relations. Commonly, conflict situations are created by stakeholders having incompatible interests. Even if personal interests are similar, there may still occur conflicts. One example of this would be an interest in performing religious practices, which may be in conflict with another religion's rituals or values in a secular society. There can thus be tensions, rivalry, competition or any other shared conflict history influencing a situation and any one decision in a conflict means great risk of hurting the interests of a part of the stakeholders. This is what makes up ethical dilemmas, also outside the realm of principled reasoning. However, by viewing a possible decision from the point of view of every other group and with their, often very relatable and understandable interests in mind, the user will be supported in countering preconceptions and other cognitive biases (Laaksoharju, 2010). The form in which arguments are presented makes it difficult to revert to value-laden principled reasoning, and invites to a proactive, concrete, solution-oriented discourse, which also decreases the power of rhetoric and invites pluralism. Unlike in debates, there is no need to limit the number of issues. Structure is instead given by applying arguments to concrete interests of actual people.

By gaining an understanding of the social implications from one's own decisions, the user will be in a better position to fulfill Kant's maxim to act so that the decisions one makes can be considered right, regardless of who makes them and who is subjected to them (Kant, 2006). The tool thus gives support in determining the decision that after scrutiny is most consistent with one's own morality. At the same

time it is developing awareness of moral problems and the skills to deal with these. As it is based on the assumption that people are not making judgments in isolation, it allows multiple parties to contribute to an analysis by adding stakeholders and interests; give suggestions for decisions; and participating in analyzing the consequences that these may have. This means that it functions as a facilitator of democratic participatory and inclusive dialogue (Kavathatzopoulos, 2010).

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HOW INFORMATION TECHNOLOGY IN SCHOOL INFLUENCES THE STUDENTS' DEMOCRATIC COMPREHENSION

Else Lauridsen

Abstract

According to Danish law, it is one of the main purposes of the municipal primary and lower secondary school to prepare the students for active participation in society based on freedom, equality and democracy. Therefore, the teaching of the school and its daily life must build on these values.

In this paper I discuss how the use of information technology in schools influences the students' democratic comprehension. After a brief introduction to activity theory I use Engeström's mediational triangle to illustrate how interactive whiteboards (IWB) influence the teaching in school. I argue that you can use the IWB as a support for developing the students' democratic comprehension by focusing on and – if necessary - changing the elements of the activity system, e.g. the rules and the roles concerning the use of the IWB.

Keywords

Democracy, democratic comprehension, teaching, school, activity theory, interactive whiteboards.

1. Introduction

According to Danish law, it is one of the main purposes of the municipal primary and lower secondary school to prepare the students for active participation in society based on freedom, equality and democracy. Therefore, the teaching of the school and its daily life must build on these values[1].

Since 1945 the Danish debate about democracy has been influenced by the ideas of Alf Ross[2] and Hal Koch[3]. According to Ross, democracy is a judicial and formal concept concerning a country's form of government. As opposed to this, Koch saw the conversation as the essence of democracy. Democracy is an informal process in which we during dialogue aim at a common and fair solution to the problems. Democracy is a way of living and communicating with others.

One way of preparing the students for engaging in democracy is through a Ross approach to democracy as a form of government: The students must learn about the principles and history of democracy: Which political parties are represented in the Danish parliament? What are the differences between a communist and a socialist? What did democracy mean in the ancient Greece? Etc.

Another way is by letting the children actively experience democracy in their everyday school life through discussions and dialogues. This Koch approach to democracy as a way of living and communicating has had and still has a great impact on the culture in the Danish municipal primary and lower secondary school.

The Danish professor of didactics, C. A. Larsen, has developed a model for the structures and elements of teaching[4]:

[1] Folkeskoleloven § 1, 3
[2] Ross (1946)
[3] Koch (1945)
[4] Larsen (1997)

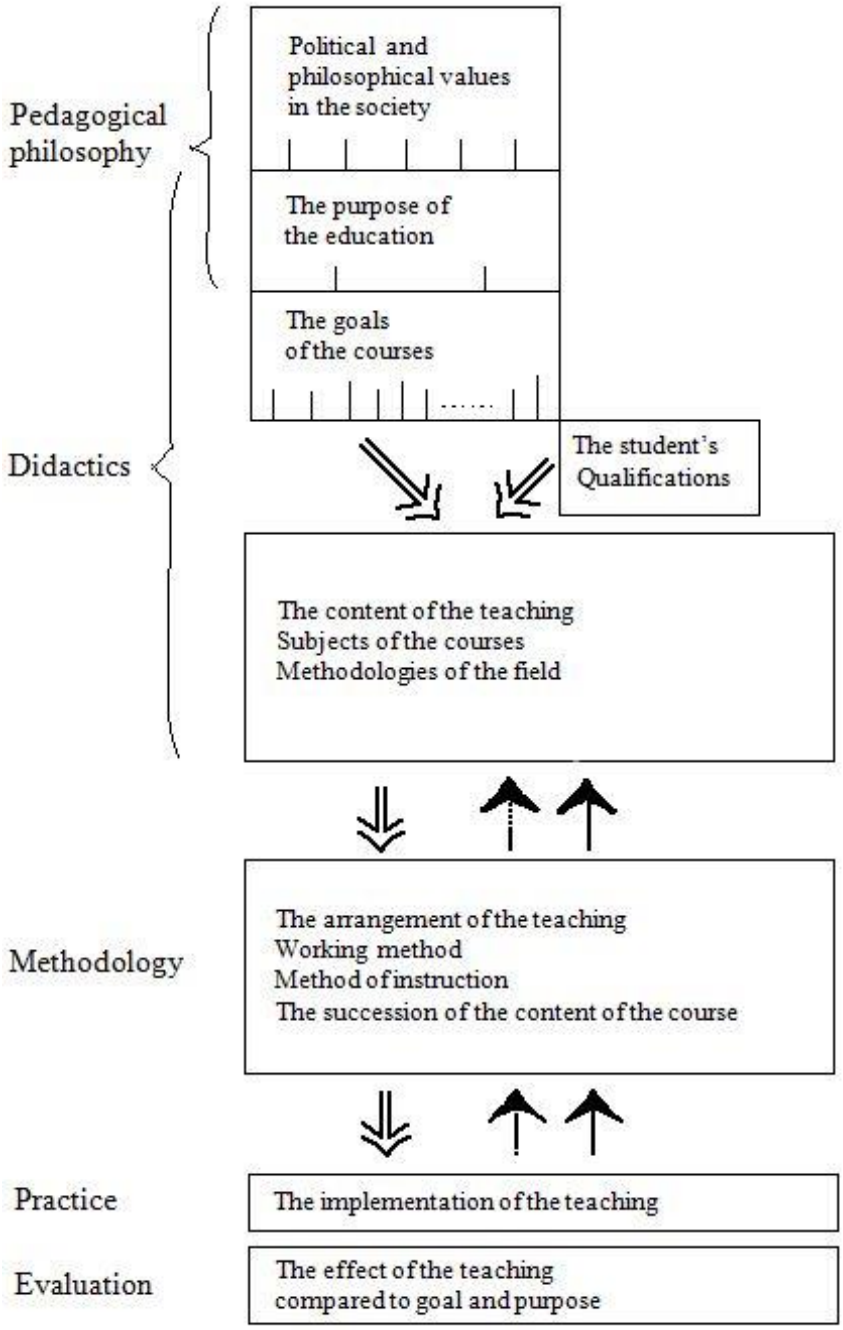

Figure 1: C. A. Larsen's didactical model[5]

The model illustrates the relationship between the pedagogical philosophy, didactics, methodology, practice and evaluation. As shown, there is a relationship between the political request for a democratic comprehension among students and the working methods and methods of instruction in the teaching situation. According to Larsen there are direct connections from the goal of the teaching to the methodology and practice of the teaching, but the arrows have been omitted from the model in order to keep it simple.

Taking a Koch approach to democracy, learning about democracy is not linked to just one course or certain subjects in for instance Danish lessons. Getting to know democracy is about the dialogue and

[5] Larsen (1997), 35

the way in which we act when we are together. Therefor the arrangement of the teaching is more crucial than the content of the teaching.

Hence the students will learn to participate in a society based on freedom and democracy when the methods of working and instruction underpin the dialogue and conversation in class. This can happen when the students are actively involved in the education, when they feel responsible for their own learning process, when they cooperate with their classmates in group work, when they engage in discussions in class, when they learn to express their opinion and acknowledge the opponent's right to disagree, when the students learn to think critically and independently, when they have influence on their own role in the teaching, when they have impact on the rules of the school, and when the teacher is not considered as possessing the truth while the students are thought of as ignorant children.

In this way, democracy is not only a subject for teaching – it is a way of teaching. The children get to know the democracy while interacting with other children and grown-ups.

On the other hand an approach to teaching where the teacher makes all the decisions and where the children are not given the possibilities for discussing and cooperating with their classmates will probably not enhance the children's democratic literacy.

Therefore, the methods of instruction will influence the students' democratic comprehension.

2. Activity Theory

According to activity theory the tools we use influence our activities. This means that the tools used in the teaching influence the teaching at school. The books, the blackboard and chalk, the mathematical formulas, the computer and the calculator all influence the learning situation and thereby also the students' democratic comprehension.

Activity theory is a social constructivistic theory that aims to understand human beings individually and socially through analysis of their activities. The theory evolved in Russia in the 1920s and 1930s by the work of Vygotsky[6], Luria[7] and Leontjev[8].

One of the fundamental assumptions of activity theory is the unity of consciousness and activity. The human consciousness cannot be analysed isolated but must be studied within the context of human activity. Therefor an activity is the smallest meaningful context for understanding the actions of a person.[9]

Another fundamental idea is that our activity is mediated through tools and artefacts. Artefacts are not seen as dead items. When we use a tool for doing a job, the tool reflects the experience gained by other persons who have tried to solve similar problems. These persons have modified and refined the artefact, and herby it has been shaped by their experiences, knowledge and concepts. Therefore when using the tool we interact with this insight and these conventions and knowledge about how the tool should be used[10]. The tools are mediating the world to us. We are not in a direct contact with the world but handle, perceive and interpret it by means of physical and mental tools. This means that the tools influence and shape our activities.

The mediation theory has traditionally been presented in a triangle:

[6] Vygotsky (1929), (1960))
[7] Luria (1928)
[8] Leontjev (1932)
[9] Kuutti (1996), 28-29
[10] Kaptelinin and Nardi (2006) , 70 and Säljö (2003), 85

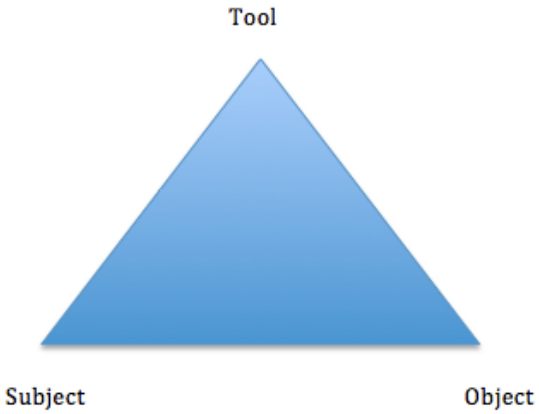

Figure 2: The traditional mediational triangle

But according to Engeström this figure is too simple to explain the interaction between the subject and the object, because it does not include the social and cultural context in which the interaction takes place.[11]

Therefor Engeström has extended the figure to include rules, community and division of labour[12]:

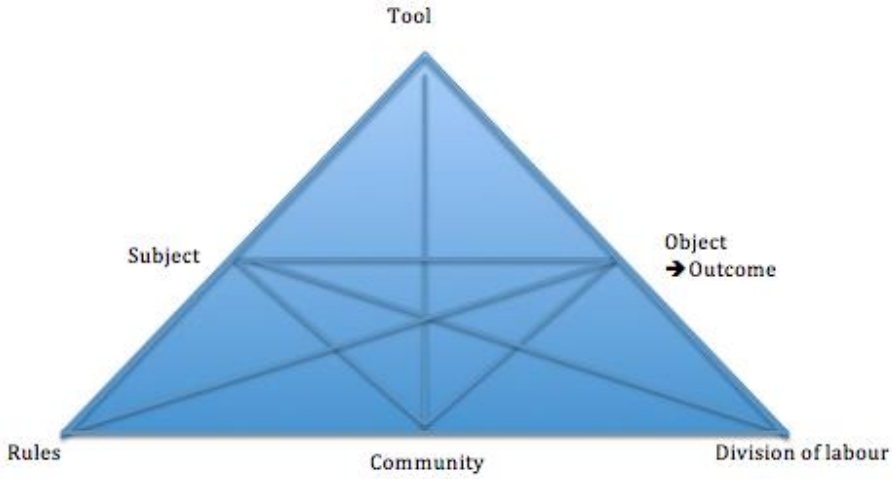

Figure 3: Engeström's mediational triangle

In his theory Engeström moves from Vygotsky's individualistic approach to human activity towards studying activity in communities.

Individuals are constituted in *communities*. The culture and the community always influence us - even when we are acting on our own. The *rules* are the implicit and explicit norms and sanctions that specify and regulate actions and social relationships in the community. *The division of labor* is the continuously implicit and explicit negotiated distribution of power, tasks and responsibility among the actors of the activity system.[13]

Tools mediate the relationship between subject and object, rules mediate the relationship between subject and community, and the division of labor mediates the relationship between object and

[11] Engeström (1999), 30-31
[12] Cole and Engeström (1993), 8
[13] Cola and Engeström (1993), 7

community. The six elements of the activity system have all been shaped by history and they will all change in the future.[14]

Many researchers have used Engeström's expanded meditational triangle as a useful tool for analysing and describing the use of information technology. The triangle enables the identification of central aspects of an activity system and it helps pointing out the contradictions within the system. [15]

3. Interactive whiteboards in classroom teaching

In my master thesis I used an activity theory approach to analyse the use of interactive whiteboards (IWB) in Danish lessons in the municipal primary and lower secondary school. I based the thesis on a case study made in fifth grade in Eltang Skole located in South Denmark.

Initially I observed the use of the IWB during some Danish lessons, all the students answered a questionnaire, and I interviewed the teacher and six of the students. On this background I analysed the use of the IWB by means of Engeström's mediational triangle:

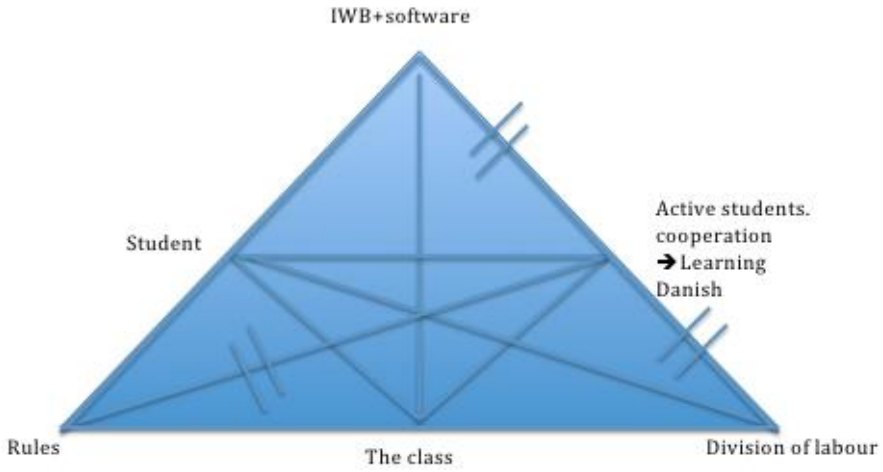

Figure 4: An analysis of the use of the IWBs

The *subject* of the activity system is the individual student who is part of the *community* constituted by the class. The *object* is the purpose of the activity system. Here I have placed the teacher's aim for a method of teaching where the students are actively engaged in the lessons through cooperation, discussions and group work. Hereby she strives for the *outcome* that the students improve their Danish competences. With this goal for the Danish lessons the teacher indirectly aims for a teaching that supports the students' democratic comprehension.

There are many *rules* concerning the activity system. Some of them are explicit like laws and other political decisions regarding the Danish municipal primary and lower secondary school. Others are implicit like the unspoken rule, that the teacher controls the use of the IWB. The *division of labour* describes the roles that are played by the teacher and the students in the class. Does the teacher play the role of a coach or an omniscient oracle? Are the students passive or actively involved in the learning process? Etc.

This analysis demonstrated more contradictions in the activity system constituted by the Danish teaching in the class:

[14] Kuutti (1996), 27-28

[15] Kaptelinin and Nardi (2006), 99-100

The teacher made the decisions on when and why to use the IWB. The children were not allowed to use it in the breaks, they could not use it for making an impulsive contribution to the lesson, they did not use it on their own initiative as a tool when doing group work etc. Therefore there was a contradiction between the rules and the aim for a method of teaching where the students feel responsible for their own learning process and are actively engaged in group work. Consequently there was a contradiction between the rules and the object of the activity system.

The roles indicated that the teacher was active in using the IWB for showing the students films, pictures and webpages, while the students generally had the role of a passive audience. This distribution of roles did not facilitate a learning situation characterised by active children and knowledge sharing. Hence, there was a contradiction between the roles and the object of the activity system.

Both the rules and the division of labour resulted in an environment where the students lost their democratic influence on the Danish lessons.

The analysis also demonstrated contradictions between the goal of the activity system and the properties of the IWB:

The size of the IWB makes it possible for many persons to view the screen simultaneously. But the IWB is too small for having many people working on it at the same time. The big screen, the loudspeakers and the internet connection makes the introduction of new instruments in the education possible: Internet resources like Google Maps and Wikipedia, music, films and pictures now become a natural part of the lessons just as the traditional text book is. Therefore the IWB is mainly useful when one person uses it for showing something to many persons.

As described above a tool is shaped by the past and will shape our activities when we use it. The IWB is shaped by old learning traditions and this will influence the lessons when we use it today. My analysis found that the teacher mainly used the IWB and its software for showing the children webpages, pictures and videos. Neither the IWB nor its software invited the students to engage actively in the learning situation and thereby gain democratic influence on the learning situation.

The analysis pointed out contradictions between the rules and the object, the roles and the object and the artefact and the object of the activity system. Despite the teacher's aim for a method of teaching where the students were actively engaged in the lessons through cooperation, discussions and group work, the study showed how the IWB created an environment where the children were passive and lost democratic influence on the learning process.

3.1 Didactic design of Danish lessons

In cooperation with the teacher I made a didactic design of the Danish lessons during a period of six weeks where the students worked with news media. We wanted to examine the possibilities of using the interactive whiteboard as support for a teaching where the students engage in group work and discussions in class.

We wanted to change the roles and the rules about using the IWB and we tried out new software and combined the use of IWB with the use of other technologies.

One way of changing the roles was by giving the students the role as writers on the IWB. Traditionally the teacher has directed discussions on class and written down relevant phrases on the blackboard. Now the student should learn to direct discussions in class and write down what they considered relevant. By this change of roles the conversation in class became more student-to-student oriented and less teacher-to-student or student-to-teacher oriented. However it takes time to learn to manage the new roles.

In more activities we made it possible for the children to give input to the IWB, e.g. by making brainstorms in Wallwisher[16] or by sending SMS text messages to the IWB[17]. The students became

[16] See http://padlet.com, an online service that enables brainstorming, discussions etc.

[17] By means of a mobile internet connection

more engaged in the teaching when they could see their own words, arguments and answers on the IWB. Moreover these tools made the quiet child feel more comfortable about participating in discussions in class.

By focusing on the students' roles and the rules about using the IWB we experienced how the IWB could support the students involvement in democracy in class. This happened, when the students got influence on when to use the IWB and for what purpose. When the children played an active role in the use of the IWB and not just the role of an audience. When the technology made it possible for the quiet boy to speak out his opinion. When the IWB was used for expressing not only what the teacher thought or what scientists had worked out, but as a medium for what the students thought. And when the whiteboard became a representation of the positions and viewpoints of the students in a discussion on class.

During these six weeks I regularly observed the Danish lessons. At the end of the project the students answered another questionnaire and I interviewed the teacher and six of the students again. Subsequently I analysed this new empirical data by means of Engeström's mediational triangle. The analysis showed that there still exist contradictions in the activity system but the system is transforming. The teacher wants to change the roles and the rules concerning the use of the interactive whiteboard, but the changes take time and do not happen in one day. Furthermore, artefacts have changed too as we introduced more new tools during the project. When using another software and technology we experienced how the IWB can support a teaching where the students develop their democratic skills.

3.2 Preconditions, recommendations and challenges

Based on the case study and the activity theory I have listed a set of preconditions and recommendations that should be in place for a use of an IWB as a support for the students' democratic comprehension:

- **The students:** The students are willing to engage actively in cooperation with their classmates.
- **The class:** The environment in the class makes participation in the learning activities feel acceptable and safe to the students.
- **The tools:** The teacher must consider other tools than the IWB and its software.
- **The rules:** The students should have a bigger influence on when and how to use the IWB.
- **The roles:** The IWB should belong to the students and not only to the teacher. The students must be activated in using the IWB.

Most of the students in the class were positive towards a learning environment with more cooperation and a bigger use of information technology. But such a use of the IWB also presents some challenges: The teacher must ensure that group work doesn't end up with children fooling about, and that the weak students do not lose their influence on the activity while the strong students do all the work. Furthermore this use of the IWB demands a bigger effort from the teacher, as she must rethink the use of the board instead of just letting the IWB control the teaching.

4. Conclusion

Every time we use a new technology in the school it is relevant to consider how it influences our teaching and the students' opportunities to actively engage in cooperation with their classmates and hereby develop democratic comprehension:

Which roles are given to the students through the use of technology? Are they active in finding, analysing and discussing information from the Internet? Or are they a passive audience to the teacher's fancy show on the IWB? Do they investigate the nearby forest gaining information on their mobile phones while being out in the nature? Or do they hide behind computer screens in the

classrooms? Do they cooperate with their classmates on writing a shared document on their tablets? Or do they work individually on their own computers answering another multiple-choice test?

And which rules dictate the use of technology in the classroom? Is it the teacher alone who decides when and how to use information technology? Can the student send an SMS text message to the IWB if he wants to add some information or a question? Are the children free to use the IWB in their group work? Can the students bring the tablets home to work and play with them? Etc.

Information technology can enhance the students' democratic comprehension. Not only by providing a huge amount of information but also by creating technological possibilities for knowledge sharing, discussions and group work – if used in the right way. But if we are not aware of the properties embedded in the technologies we may create an environment where the children lose their democratic influence on the learning process.

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MARKETING THE INFORMATION SOCIETY: SUSTAINABILITY, SPEED AND TECHNOMASS

Thomas Taro Lennerfors

Abstract
This paper makes the simple point that Green IT or Sustainable ICT, a quite recent trend in the ICT sector, must be seen in relation to other values with which information technology is promoted. In this paper I argue that at least two other values are promoted, first the concept of Smart, and second, the concept of Speed. Choosing to focus on speed, I describe how information technology is advertised, and how speed is sold. Given this empirical data, I then turn to discussing how speed is related to power in a modern society, by drawing on Paul Virilio. By then turning to Alf Hornborg, I tentatively sketch an understanding of information technomass, which can be fruitful to understand what Green IT or Sustainable ICT really is. Given the notion of information technomass, it is argued that given the predilection with speed, or at least with fighting slowness, information technomass is likely to grow and our society will indirectly choose a less sustainable path.

Keywords
Speed, Green IT, sustainability, smart, visions

1. Sustainable ICT and its limits

During the last five years, Green IT, which is an umbrella concept for environmental concerns related to IT, has been appearing in news, corporate reports and various white papers and governmental publications. While IT is said to stand for about 2% of CO2 emissions, it is said to have a potential of alleviating environmental impact to a much larger extent (Mingay 2007). This paper aims to discuss ICT and environmental sustainability. While the positive aspects of information technology for alleviating environmental impact is often highlighted (especially in the Green IT movement described above), in this paper, I will also try to draw on unconventional theory to create an understanding of the relationship between information technology and sustainability. This draws on the idea from philosophy of technology that technology is not inherently value-free (deGeorge 2003). This does not mean that value is completely inherent in information technology either, but that technology and society is co-created, or co-shaped.

In relation to the aforementioned trend, I will argue that there are limits to the sustainability of ICT. I will argue that "Green ICT" or "Sustainable ICT" does not sell, and I will raise the question of how ICT is promoted. I will suggest that smart technologies are attractive and also the concept of "speed". In this paper, I choose to dig into the concept of speed and show both theoretically and empirically with examples from Sweden and other countries, how a discourse of speed permeates the marketing of ICT. I thereby argue that the values of ICT are constantly negotiated and that solely promoting Green IT without thinking about the other values of ICT is misguided. Rather, one should understand the different values of ICT and strive to understand the trade-off that is consciously or unconsciously struck between them. Having understood that, it is important to normatively promote a trade-off that is ethically acceptable.

1.1 The nature of Green IT

What is Green IT or Sustainable IT? While some authors use the concept Greening through IT (Tomlinson 2010) and some separate three levels of environmental impact of IT (Hilty 2008), I opt for the standard definition encompassing two dimensions, the Greening of IT - meaning the reduction of environmental impact of information technologies (often taking a value chain perspective, reducing environmental impact from mining of rare metals, manufacturing of IT equipment, energy use while

using IT equipment, and recycling of IT equipment), and the Greening by IT - which covers the positive impact of IT in reducing environmental impact in other sectors of society (e.g. Energy Management Systems, such as BEMS and HEMS, teleconferences, e-documents) (Mingay 2007).

IT indeed bears the possibility of dematerialization, for example substituting paper with electronic documents, so needed for creating a sustainable society. Hilty states that "creating an information society which makes use of ICTs to provide immaterial services where previously material goods were produced, transported and disposed of, could be a key to economic dematerialization" (Hilty et al. 2008, p. 14). Dematerialization is a symbol of the dream of doing more with less - increasing efficiency and reducing waste in different sectors of society. While I recognize this potential, I prefer to see IT as a form of concentration rather than dematerialization. The Greening of IT discussions about resource extraction, production and waste continue to remind us about the material, albeit concentrated, character of IT (Yotsumoto et al. 2011, 2012).

Indeed, the founding study by Gartner suggest that the CO2 emissions from the IT-industry amounts to 2 % of global CO2 emission, in parity with the global airlines (Mingay 2007). Even though equipment is constantly getting more and more powerful and able to process more data, the information explosion together with the penetration of IT into many aspects of human life is making the environmental impact of IT an important issue for industry and policymakers.

1.2 The lacking attractiveness of "Green", and rising the question of what does sell

In previous empirical research on Green IT in both Sweden and Japan, we have reached the conclusion that the concept of Green does not "sell" in the ICT industry. Companies that promote green solutions (green datacenters, green sensoric systems) feel that the customers do not demand these technologies and solutions. Rather, the customers seem conservative and narrow-minded, focusing only on economic aspects such as cost. This goes both for corporate customers and consumers (Yotsumoto et al. 2011, 2012, Fors and Lennerfors 2013, Bygge 2012).

This lukewarm response to Green IT which was promoted as a new industry shockwave (Mingay 2007) indirectly brings up the question - what does sell? We have already mentioned one answer: cost. But there are indeed others. In previous research we have, in line with studies in marketing, focused on looking at how ICT is marketed. Studying the commercial by Ericsson called *The social web of things*, it was suggested that we have a vision of the information society and smart technologies (especially the smart home) as god-like, silent, and cool (Lennerfors 2013 forthcoming). This paper builds on that research to understand other aspects of the visions of ICT, in other words, how ICT is promoted.

So, what does sell? What are the values that are promoted in ICT? What is that which makes the industry, and indeed customers and consumers, "tick"?

2. The nature and marketing of speed

In this part I will discuss how ICT is sold, by drawing on commercials of services relating to ICT. I will focus on the marketing of speed. I will also present some theories about speed that are of help to understand what hopes and visions are promoted in ICT.

2.1 Marketing of ICT: Green, Smart, Speed

In this part, I will discuss how speed is sold and what I understand by the selling of speed. This is a set of examples and does not purport to give a full picture of how ICT is marketed. As already discussed in the preceding part, ICT is also marketed as green and smart. An example of marketing ICT as green is VerneGlobal's commercials in different airports around the world (I observed them at Gatwick airport in London) of data centres on Iceland. Three commercials, that were physically located near each others, read "**100% green**, 50 % of the cost. Iceland's renewable energy powered data centre. It's not just a 'conscience' decision", "**Envious?** With our renewable energy powered data centre you can

green your balance sheet", and "**100%** green renewable energy powered data centre". The discourse in these commercials is located in the interstices between environmental and economic sustainability (Elkington 1994). There are references both to concepts relating to environmental sustainability such as "green", "renewable" as well those relating to economic sustainability such as "cost", "not only conscience", and "balance sheet".

An example of marketing smart ICT is the previously mentioned commercial of Swedish telecommunications company Ericsson. In this commercial we see a vision of the smart home, a home with which the protagonist communicates through a social networking service, with the home (the brain) and all the home appliances as friends. The home is god-like - it coordinates all the appliances in the smart home. The whole commercial is quite silent (apart from the noise from electronic appliances) and it gives an understanding of the information society as being silent (probably in opposition to the noisy industrial society). Technological noise, and human voice are excluded from the commercial. ICT is here promoted as a smart technology that can assist human beings and even replace the need of human beings to think. This relates quite well to a stream of thought in social studies of technology that posits technology as something transcendent and intrinsically linked to religion (Noble 1999).

But how about the marketing of speed in ICT? In a recent commercial (2012) from Swedish Bredbandsbolaget - a provider of broadband Internet - speed is what is sold (Bredbandsbolaget 2012). We see a woman using her laptop computer in a chair in her living room. Suddenly the chair starts to move. It is drawn as a sleigh by four robot dogs. Suddenly the dogs stop and the women finds herself, in her chair, on top of a fast moving train, moving much faster than the dogs. In the next sequence, the whole train set stops. It's now placed on top of a space shuttle rushing ahead at unimaginable speed. Then the camera zooms out and we see the whole pyramid, with robot dogs and women on top of a train, which is in turn on top of the space shuttle. And beneath the space shuttle, there is a man running and supporting it, obviously moving the whole assemblage forward. This primus motor, the man beneath it all is the Bredbandsbolaget man. Even though the visual representation might say it all, it is accompanied with the following statements: "Do you want it to be fast? Do you want it to be faster than fast? Do you want it to be faster than faster than fast?"

The second set of commercials that will be described is produced by the Swedish mobile phone operator 3 (2012-2013) (3Sverige 2013). There are quite a lot of commercials featuring "mannen från 3" or in English, the man from 3. He is constantly chased (on skis, on jetski, on a train) by some mystical men called "dom andra" or "the others" (probably referring to the other operators), and he is always saved by his female partner. In one of these commercial the man from 3 rides an offroad motorcycle, goes to a cell phone transceiver, opens up a control box, where there is a screen which says "surf speed". He turns a switch and the surf speed goes up to maximum levels, while a voice says "increasing surf speed". He turns around and sees the others. There are three of them, dressed in black, riding motorcycles. We hear a voice saying "it's too fast, stop him". They start to chase him, and almost reaches him, when the man from 3 calls his partner who cuts down a tree with a chainsaw which hinders the others, and let's the man from 3 escape.

In a commercial from March 2013, the broadband, telephone and TV provider ComHem, shows the face of ComHem - a quite corpulent woman with red hair, dancing and singing the tune of Gangnam style and with similar staging, but with new lyrics (ComHem 2013).

Surf ComHem style.

> When you surf, stream a movie and upload a file
>
> it has to be fast and good, it has to be stable
>
> when you play games, it can't be slow
>
> it has to be speedy and it has to be fussy
>
> really maxed broadband, 200 mb
>
> for you who wants super maxed, more, most
>
> Surf ComHem style
>
> And the commercial ends with the message "Fast, stable broadband"

Apart from these commercials, which might seem to be a bit comical, there are plenty of other examples. A quite common example when the author himself surfs the web is banner advertisements from MacKeeper. Praised by professional reviewers but held to be a scam by average users (Kahney 2012), MacKeeper advertises with the question "Slow Mac?"

All of these commercials point to that speed is sold, both in terms of discourse and of imagery (chases, speeding space shuttles, etc.).

2.2 Speed and ICT

In the preceding part, I have shown how ICT is marketed as fast, using discourse and imagery of speed. This might not sound too surprising to the reader. I will therefore turn to some theoretical work on speed to point out how speed is inherent in the modern society and how this affects our understanding of information technologies.

First of all, one might turn to the work of Daniel Spreng (2012), who writes about ICT and sustainability. He argues that three main concepts are the main production factors for tasks, processes, services and products and that they are partially substitutable for each other, namely energy, time, and information. If information stands for information technology, Spreng argues that ICT can indeed be made to save energy, but often we use it instead to save time. By choosing time rather than energy, we choose a less sustainable path. Even though one might not completely agree with the tripartite framework of Spreng, it is indeed interest to think of ICT as a trade-off between energy and speed. If ICT is marketed as fast and speedy, we are indeed choosing the less sustainable path, according to Spreng.

But, when we move beyond theorists of information technology, there is more to the concept of speed. I will particularly draw on the concept of dromology, or the increasing speed of transport and communication, as discussed by Paul Virilio (2006, 2012) as a candidate of understanding one central driving force in understanding both the modern society and information technology. Dromology is most easily explained as the science of speed. Paul Virilio, who is an urbanist and philosopher, is interested in explaining the modern information society. According to Virilio, speed is that which maintains power differences in the world. Rather than exploitation by means of force, the world is now divided into the fast and the slow. In contemporary language use, one often hear about a race to the market and the laggards. We also read about computing algorithms which control financial markets. Computers respond to market signals within nanoseconds. When it comes to information technology, it is not about absolute speed, but relative speed. Therefore, development of information technology can easily be seen as a kind of power struggle, between the fast and the slow. We know the cliché "what Intel giveth, Microsoft taketh away", but we seldom think of this as a race for relative speed.

But for Virilio it all started out with the car. From the driver's seat of a car we could see fast movement, as if we went to the cinema, but in real life. Of course, the car moved much faster than people, and later came the commercial airplanes and the race for speed, up until the Concorde which broke the sound barrier. It is interesting that the race for speed in the automotive sector has eventually lost much of its importance. One interpretation would be that in the beginning of technological development one seeks for speed, and in later phases one realizes that speed is not what ought to be sought for, but rather user friendliness. On the other hand, we can see that legal frameworks are countering the development of faster vehicles. Speed limits on roads in different countries makes speeding something illegal.

Right now, information technology is marketed as fast, and speed is something that is desired by consumers. Will this continue? One response might be that, similarly to development of cars, sooner or later we will stop focusing on speed. There is a limit to what kind of files we would like to send to each other and the speed of the information technology will settle on some satisfactory level. On the other hand, we know that there are constant updates which makes information technology be slower and slower. Information technology is therefore constantly losing speed. Given the race for better and also more demanding services, the race for speed is likely to go on.

And at this stage it might be important to point out that the race for speed is first and foremost about countering the experience of slowness when using information technology. It is therefore not about some phenomenological sensation of speeding, some idea of absolute speed, but rather to counter slow information systems. The idea is about staying ahead of the system, or at least keeping up with it.

3. The marketing of speed and impact on information technomass

Given the preceding parts of the paper, speed is a main factor that is used to promote information technology, and obviously speed sells. We have also identified speed as an inherent factor in modern societies which divides between those with more and those with less power. Are there any implications about this strive for speed, or at least the tendency to fight slowness?

3.1 Speed and information technomass

Although the connection is not fully clear, it seems possible that striving for speed is something which will have an impact on the amount of information technomass in the world. If one follows ecological anthropologist Alf Hornborg (2001), one might conceive of technomass in the same way as biomass. Technomass is by Hornborg seen as the total amount of industrial technology, factories, roads, sewage systems, etc. This technomass is constantly trying to multiply itself and grow, and does so in expense of biomass. Hornborg never discussed information technomass, so I would like to sketch out what this concept might mean for understanding sustainability and ICT, especially related to speed. Information technomass is the total amount of information technology equipment, including working equipment and electronic waste. Given the race for speed or the fight against slowness, I expect that information technomass will grow. Green IT would in the view of information technomass to make information technomass coexist with biomass. Returning to the question of updates, touched upon in the preceding part, the need for updates is something which makes information equipment, such as cell phones, obsolete and converted from living information technomass (living equipment) to dead information technomass (waste). Constant updates and improvements of the systems, will make information technomass grow. This is however building on the assumption that all changes to the system will be demanding more resources. There are also the possibilities of working to improve the system making it leaner. In such a case there are indeed possibilities of decreasing information technomass. But given the promotion of speed, this will be more difficult.

3.2 Concluding discussion

To conclude, I have argued that the trend of Green IT or Sustainable ICT must be seen in relation to other values that are promoted. The visions of information technology will never just be about promoting a green society. Rather, in this paper I have shown that at least two other values are promoted, first the concept of Smart, and second, the concept of Speed. Choosing to focus on speed, I have described some advertisements of information technology, which in one way or another promotes speed. Given this empirical data, I then turned to discussing how speed determines who has more and less power in a modern society, by drawing on Virilio. By then turning to Alf Hornborg, I tentatively sketched an understanding of information technomass, which can be fruitful to understand what Green IT really is. Given the notion of information technomass, it is argued that given the obsession with speed, or at least with fighting slowness, information technomass is likely to grow.

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ETHICAL DELAY IN EMERGING ICT

Richard Lucas

Abstract
In this paper I examine the part that academics play in the identification of the ethical implications in the research fields of ICT. I contend that ethics in ICT, typically, does not get advance consideration in the academic literature: It is not until after an ethical lapse occurs in an ICT field of study does the ethics of that field get a serious examination. I call this phenomena ethical delay. I identify the first occurrence of common ICT terms and the point at which it presents with the ethical term as told in academic writings (journals, books, presentations, etc.) by recognized academics. I examine three terms: {\it enterprise computing}, {\it social eco-informatics}, and {\it cloud computing}: I show that there is a significant delay from the time of the first appearance of the term to when ethical problems are discussed in the academic literature. I then present an example from the field of astrobiology where researchers are attempting to anticipate the ethics of their work. I conclude that information technologists must work in concert with ethicists to predict future problem areas: the ethics-first approach needs to prevail. I wonder at the lack of uptake of anticipatory ethics.

Keywords
astrobiology, pre-emptive ethics, enterprise computing, cloud computing, social eco-informatics, techno-ethical scenarios, ethical technology assessment, ETICA, ethical impact assessment, anticipatory technology

1. Introduction

Over the course of the past few years I have investigated the occurrence of the term ethical (and it variants) in conjunction with emerging fields of ICT as expressed by catch phrases (cloud computing and enterprise computing to name two). I have restricted my search to academic sources in an effort to gauge the efficacy of ICT ethics research. The results have been disappointing. There is little to support the idea that ICT researchers consider the ethics of the research they carry out. In casual conversation at academic conferences which are not aimed specifically at ethical issues (such as ECC@UC2012, SOTICS2012) the reaction of my questions about the ethics of their projects researchers usually say “that would be a good idea” and then wander off into the technical niceties of their work.

I experienced the same response at industry conferences and workshops (eg. Future Gov2012) but then I expected that. I suppose I was expecting more from academics that I hoped would be more thoughtful about the implications of their work. I then thought that perhaps it was not possible to anticipate ethical considerations so I went looking further afield. It took little time to find an example (astrobiology) where researchers were examine the ethical implications of future work, field of research that are not yet possible. Why do ICT researchers not do the same?

2. The Problem

Where is the evidence for my claim in the introduction that there is no consideration of ethics by ICT re- searchers? I first came across the problem when I was asked to give a presentation at ECC@UC2012 on ethics. Initially I thought this would be straightforward: find an example in the academic literature and show how ethical theory was used to prevent bad things from happening. Here is what I actually found.

2.1 Example 1. Enterprise Computing

I used Google Scholar to search for papers and books that examined the phrase enterprise computing combined with several variants on ethical, namely, ethics, ethic, ethic*, and moral. The results were then categorized into eight groups. A summary[1] of the results is:

Enterprise Computing Results					
Enterprise Computing +	Ethic*	Ethic	Ethics	Ethical	Moral
Jnl or Org Code of Ethics	92	61	0	43	13
Book Table of Contents		51	24	35	17
Reference to Ethics paper		62	47	83	15
Ethics is important		145	68	107	73
Educational context		146	40	58	12
Actual Examples		0	0	0	0
Unable to locate term		54	35	44	41
Ethics Committee		20	13	0	0
Categories Total		570	288	327	201

Statistical Analysis Part 1

This was subjected to a statistical analysis, that is, medians and quartiles (measure of variability) of the ranks were taken because the data is not normally distributed and technically this is the most appropri- ate stat to use for ordinal data. The median rank is highest for Educational context (Med = 98.5, In- terquartile range = 32.25 to 192.0) and the next highest is Journal or Organisation CoE (Med = 116.0, Interquartile range = 56.5 to 226.0). These classifications also have the largest amount of variability as represented by the interquartile ranges. The classifications with the lowest median rank are Ethics Com- mittee (Med = 194, Interquartile range = 150 to 212.5) which also has the least amount of variability, and Reference to Ethics paper (Med = 177.0, Interquartile range = 109.0 to 233.0).

There were 9 references which were included in 2 classifications, and 2 references which were included in 3. So the categories are not mutually exclusive. This would pose a problem for analysing the significance of the differences between the groups, because they are assumed to be independent of each other. The analy- sis was performed excluding these repeated cases.

A Kruskal-Wallis Test[2] test was performed to determine if there were any patterns in the distribution of the individual result. The category Actual Examples was not included, well, because there were none. There is no overall significant difference between the rank of the groups.

Statistical Analysis Part 2

Perhaps the above is just an artefact of history, that it is merely a matter of time before research into ethics and enterprise computing comes good. That is, is enterprise computing any different to any other field in ICT? To answer this the Google Scholar search was extended substituting the keyword phrase enterprise computing + with:

1. mainframe computing +,
2. Project Management +,
    a) Generic b) IT

[1] A full enumeration showing the ranking of each individual Google Scholar Search Result into the grouping here is available on request.

[2] Kruska Wallis Chi Square (6) = 116.626, $p > 0.05$

b) ICT

3. Governance +,
    a) IT b) ICT
4. computer security +
5. Systems Architecture +
6. Data Warehousing +
7. Enterprise Architecture +
8. cloud computing +

Keyword Results Categories					
Enterprise Computing +	Ethic*	Ethic	Ethics	Ethical	Moral
Mainframe Computing	326	326	791	297	287
Project Management Generic	20900	20100	28100	25900	2230
Project Management – IT	926	926	702	396	220
Project Management – ICT	87	42	87	42	23
Governance – IT	157000	15900	18000	4230	1650
Governance – ICT	202	202	327	195	104
Computer Security	8740	12000	7990	7740	5060
Systems Architecture	1560	2310	2200	1330	973
Data Warehousing	16100	16100	18100	17000	2100
Enterprise Architecture	1960	2380	1870	1290	538
Cloud Computing	3430	3430	2260	3300	1450

This is no more enlightening. Enterprise computing is not a special case.

Conclusion

This tells us that enterprise computing as a serious field of study, has been much neglected and, disappointingly, is not a special case. If it had been then there might be a model from another to use and trumpet for all emerging ICT fields.

2.2 Example 2. Social eco-informatics

I then went on to examine another case in detail: social eco-informatics. I reported on the results of this research at SOTICS2012 (Lucas, 2012a). This is what I found.

The term social eco-informatics combined with ethics (or its variants) simply did not occur! I then excluded the term social and found some references to ethics. So, from when eco-informatics first occurred in 1989 some 23 years earlier (Koshkariov et al, 1989) there ought to have been plenty of time for researchers to encounter and discuss ethical issues. The details of the eco-informatics results are:

Category	Ethics	Ethical
Jnl or Org Code of Ethics	1	0
Another field's ethics	5	4
Reference to Ethics paper	3	2
Ethics is important	5	2
Personal ethics	1	1
Soft science	1	1
Actual Examples	0	0
Moral evaluation	0	0
Unable to locate term	39	9
Categories Total	55	19

It does not take any fancy statistical analysis to see quite clearly what the result is. The case for eco-informatics is no different to that of enterprise computing. No actual examples of ethical consideration were found in the time between the introduction of the term in 1989 and the time of presentation in 2012 (some 23 years).

2.3 Example 3. Cloud Computing

Not to be deterred by these disappointments I returned to my original list of terms used for the ECC@UC analysis and re-examined the one term that I thought was quite popular and ought to appear with ethical issues considered. I did this to see if there was anything in the original search that I had missed; surely there must be an example in such a visible and, to me at least, obvious research area with ethical difficulties within easy reach. Sadly as will be seen shortly, no.

This was meant to be an example where it is relatively easy, with some forethought, some deliberation, to examine research from an ethical point of view. The delay from inception of the idea of cloud computing to the consideration of ethical matters is significant: 96 of the 110 (more than 87%) papers all occurred in the past four years while the area has been active for over 20 years. As a proportion of all the research articles those with relevant ethics is small (about 1 in 900).

Cloud Computing + (Ethics, Ethical, Moral, Morality)			
Year	Cloud Computing	+ Ethics etc	Relevant
1900-1974	425	0	0
1975-1979	173	2	0
1980-1984	179	4	0
1985-1989	249	5	0
1990-1994	256	10	1
1995-1999	995	14	3
2000-2004	973	34	1
2005	256	15	1
2006	347	13	3
2007	460	17	0
2008	1,700	99	2
2009	6,860	494	14
2010	13,300	1,151	16
2011	22,300	1,821	32
2012	40,800	2,373	34
Total	89,273	6,052	110

2.4 What have I learned so far?

That in all these cases there is considerable delay from the time of the technology being announced and when academics pay attention to its ethical considerations. It seems clear to me that in emerging fields of technology there has been little forethought about its ethical implications. That is, ethics has not come early.

3. Overcoming Delay

So what is the problem? Why don't ICT researchers include ethics in their projects? There is some literature that claims that it is too hard for ICT to gaze into the future. This is known as the Collingridge Dilemma[3]. Others say that

[3] In short: It is not possible because prediction is so unreliable and is not feasible because, once the technology is developed, change is difficult. See Collingridge (1980) and Croy (1996) for detailed treatments.

"the strong push for technology development too often obscures the need for any deep ethical consideration before a technical project is funded, developed and deployed" (Goujon and Flick, 2013).

I counter these claims that nothing can be done in two ways; firstly I give two examples and secondly I explore the field of anticipating ethics. Firstly I give the example of astrobiology where there is a concerted effort to anticipate the ethics of future research. I then briefly describe how (at SOTICS2012) I added ethical considerations to an ICT research paper.

3.1 Some Examples

Astrobiology

The term astrobiology is not a recent invention. The earliest example I could find in the academic literature was in 1929 in a review of a biology text. Here the term referred to the "influences of cosmic origin, reflected in the position of sun, moon, and stars, have profound influence upon human biological event upon the earth." (Krafft, 1929, 592). Only later did it take on the definition of how humans might impact extraterrestrial objects, Cockell, (2001) dates this usage from 1953. Without needing to do an exhaustive analysis of the occurrence of the term it is clear that while there have been no excursions of humans beyond the moon there are investigations into the ethicality of, say, inhabiting Mars (McKay, 2001), the philosophy of the origin of life (Aretxaga, 2006), and terraforming (Dick 2000 and Fogg 2011). Many, many examples of thoughtful consideration of future projects that are not possible at the time of writing about the ethics of such projects

Enterprise Computing

Here is an example: Think of enterprise computing where the enterprise is a multinational, multi-industry conglomeration with a number of customer loyalty cards.

It is fairly clear that developments in enterprise computing in this context, will lead to further consolidation and aggregation of citizens' information. Given these developments and uses of the citizen data already in other contexts (Thornley, et al, 2011), it is certainly plausible that government agencies and private enterprise (for example the marketing departments for both groups) will extend their uses in ways that are increasingly threatening to privacy and make them much more than mere isolated databases. This is not inevitable of course. I am not a proponent of technological determinism, the view that technology will move on regardless of what we do. However, given the extent to which the values of efficiency and productivity seem to override other values in the assessment of technologies and their uses, the pressures to extent their uses will be intense if it is seen to aid efficiency. Resistance might also be weak. In other areas privacy is eroded a little at a time in a way that is almost unnoticeable. Imagine if, say about twenty years ago before paying for groceries with credit cards was popular, the supermarkets had employed people to sit and watch all customers as they paid, and made a record of their purchases and their names and addresses. Most of us probably would have been a little concerned about this. Now it all happens automatically for those who pay by credit card and most people do not give it a second thought. This suggests that what the eye doesn't see doesn't really bother most people and what happens gradually also goes largely unnoticed.

It is here that proactive ethics comes in to play. Academic researchers ought to play a significant part in highlighting the ethical concerns before marketing departments roll out new and extended uses of customer information.

Eco-informatics research paper

With the result of no actual examples of ethical consideration and eco-informatics I picked a paper from SOTICS2011 (Fülöp et al., 2011) to show that with a little thought it is possible to include ethical considerations into a standard ICT research paper. I chose five parts of the paper and included an ethical discussion. These areas were: decision styles, optimization approaches, politics, complexity, and context.

Decision styles. In their description of decision styles there is no assessment of the moral worth of each of the different styles. For one, Rational, I make the simple observation that the cheapest choice may be preferred, that it would be reasonable to question any managers competence if they did not take ethics into account.

Optimization approaches. Here I observe that the author's selection of a single criterion on which to base decisions is very limited and that it would be straightforward to include either moral worth or contribution to society.

Politics. The authors merely say that the use of eco-informatics for political purposes is either worried about or simply accepted. I make the point that they ought to have taken a much stronger point and analysed the ethical implications of such use.

Complexity. Here I say that merely vaguely worrying about the complexity of models the authors ought to have encouraged developers to ensure that user make informed decisions, give informed consent.

Context. Here I made the point that instead of merely presenting the lack of concern by developers for context in a neutral way they could said that developer have significant and important duties.

In all it took no more than a single day to formulate the points above: hardly any time in the overall scheme of the development of a research paper.

3.2 Anticipating ethics - Some theory

Of recent times there have been attempts by some to provide ways for researchers to anticipate ethically important matters in their research.

Notable examples are: Boenink et al. (2010) with the techno-ethical scenarios approach, Palm and Hansson (2006) creates ethical technology assessment (eTA), Stahl (2011) proposes ETICA, Wright (211) has ethical impact assessment and, Brey (2012) advocates anticipatory technology ethics. It is not my place here to critique these attempts but rather to examine their uptake. Clearly Brey's paper is too recent to be used as are those of Boenink, Stahl, and Wright. This leaves Palm and Hansson whose paper has been in circulation for some six years.

There were 48 citations (2007-March 2013) of the Palm and Hansson paper and a total of 75 papers in the field of technology assessment (note that these are independent). To be of use to non-ethics/philosophy researchers I searched for papers in the technology field generally, those with ethics, those that cited the Palm and Hansson paper and within those excluded papers that only mentioned the above authors or were in ethics/philosophy journals. Here are the results.

Use of pre-emptive ethical frameworks				
Year	Technology Assessment	Ethics etc.	Palm and Hansson	Self-referencing or Ethics/Philosophy Journals
2007	7	0	4	1
2008	4	0	2	0
2008	16	0	5	1
2010	11	0	5	1
2011	17	4	11	2
2012	20	6	13	4
2013 (March)	---	---	3	1
Unknown	---	---	5	---
Total	75	10	48	10

Of the Palm and Hansson citations ten are from one of the authors above or found in either ethics or philosophy journals (remember that I am trying to uncover the effective use of these frameworks in the wider field of ICT research). Five were unable to be dated and identified as properly belonging to this search.

This leaves the following table of Palm and Hansson citations that can be attributed to researchers not in the field of ethics or philosophy:

Palm and Hansson	
Year	Citations
2007	3
2008	2
2008	4
2010	4
2011	9
2012	9
2013 (March)	2
Total	33

If we compare these numbers to those of the enterprise computing and cloud computing papers we can estimate the most optimistic uptake of Palm and Hansson's framework.

Possible Palm and Hansson influence (2007- 2012)		
Topics	Papers	Relevant Ethics Papers
Cloud Computing	85,420	5,995
Enterprise Computing	12,300	0
eco-informatics	365	0
Palm and Hansson	49	29

No matter how this might be interpreted it does not take a statistician to realize that the influence of the framework of Palm and Hansson's is very small indeed.

While this is not encouraging we ought not despair. All of the preemptive ethics authors ought to be applauded and ways ought to be found to get standard ICT researchers to use the frameworks. Initially, any of the frameworks. Here is why.

If we try to anticipate ethical considerations the emphasis of the research is different. One is much more likely, and in fact necessarily, to think carefully about what is wanted from the technology, and that involves thinking about what sort of life one thinks is a good one. This approach means taking action that will guide the development of the technology in a particular manner. This proactive stance also highlights a more positive view of applied ethics. Ethicists are frequently seen as playing only a negative role, always criticising and attempting to hinder development. While this view is to some extent correct, it is not the only thing that ethicists should be doing. Technology clearly has a positive role. In many ways our lives are much better because of various technologies.

To be effective in warding off disastrous consequences, our understanding of our man-made machines should in general develop *pari passu* with the performance of the machine. (Wiener, 1960, 1355)

4. Conclusion

I have conclusively shown that there is little evidence in the academic literature for ethics being considered in emerging information technology. This need not be so. There is evidence that other fields (astrobiology) have anticipated possible ethical considerations and there are attempts by technology ethicists to pro- vide theoretical frameworks but I could find no evidence that these are used by other technology ethicists nor other researchers in the ICT fields.

Technologists must work with ethicists to predict future problem areas. This is of course fraught with danger given the uncertain nature of prediction, but if care is taken, it is a useful and important activity. In many cases it is at least plausible that ethical problems will be identified and that we can know something about what they will be like.

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USING WIKI TECHNOLOGY IN THE CLASSROOM

Gunver Majgaard

Abstract
How do engineering students develop norms and standards for collaborative work in a Wiki society? Students from first and second semesters participated in two experiments. In the first semester they used the Wiki as project logs and in the second semester the same students used the Wiki as a collaborative learning tool for encyclopaedia articles on learning and technology. There were several potential dilemmas in the students' collaborative work: Inspiration versus imitation of others' ideas and solutions; academic achievements versus friendships; varying work ethics and academic levels; and editing or adding text. From these dilemmas and potential conflicts emerged social norms, such as norms for structuring, editing and collaborating on Wiki pages. The emerging social norms were answers to the potential dilemmas and conflicts.

Keywords
Learning and teaching; Web 2.0; Computer Supported Collaborative Learning; Wiki; Ethics in CSCL

1. Introduction

How do we evolve the engineering students' digital literacy competences in the classroom, how do they become active citizens capable of critical thinking and how do they develop norms in digital collaborative media. Specifically, how do engineering students develop norms that qualify collaboration in a Wiki society?

In this paper we discuss the use of Wiki in the classroom as a tool for exploration of digital literacy (Gee, 2003; Dohn, 2010). Digital literacy cannot be learned through theoretical readings alone, it must be developed by actual participation. Wiki becomes a digital community and the students learn through active participation in this particular community (Wenger, 1998; Thomas, 2011).

We did two explorative experiments amongst first and second semester engineering students. In the first semester the students used the Wiki as a log for a programming project. In the second semester the same students used the Wiki as a Wikipedia for portfolio assignments. The first experiment had focus on the visualization of design processes. And the second experiment had focus on co-creation and collaborative learning.

The research methodology was based on Design-based Research and Action Research (van den Akker, 2006; Majgaard, 2011). Design-based Research is a branch of educational research that uses the iterative design of educational interventions to exemplify and develop theories of learning. Action Research brings a change in the behaviour of the target group into focus and allows emerging goals. Experiments and critical reflections are the core of the research method, allowing learning from and through practice. The students participated in all iterations and the interventions took place in the classroom.

Organisation of paper: First, we introduce theory on learning and teaching based on Wikis. Then, the two experiments are presented, and the students' reflections on the experiments are summarised. Finally, the two experiments are discussed based on the students' reflections and the wiki pages.

2. Wikis for teaching and learning

"A wiki is a system that allows one or more people to build up a corpus of knowledge in a set of interlinked web pages, using a process of creating and editing pages"(Frankelin, 2007). The most famous wiki is Wikipedia, a web-based encyclopaedia, which was launched in 2001.

In an educational context, the use of wiki falls into several broad categories, e.g. lab-book, collaborative writing, knowledge base and development of competences that are essential for participation in future work and social life (Dohn, 2010; Frankelin, 2007; Tonkin, 2005).

The characteristics of wikis for teaching may particularly suit participatory, constructivist and collaborative learning models (Cole, 2009). Participatory media gives access to a new form of learning culture. Thomas (2011) describes it as:

"Information technology has become a participatory medium, giving rise to an environment that is constantly being changed and reshaped by the participants themselves" (Thomas, 2011:42).

The Internet-connected computers have become part of a new learning culture based on participation and empowerment. As in any other community social norms are formed and structured as answers to potential and actual conflicts among the participants. The community is, in this way, developing itself and its boundaries coping with social and ethical issues that barely can be predicted in the beginning.

3. Classroom settings

The target group was first-semester and second-semester Learning-and-experience-technology students. We did two wiki experiments.

In the first semester the students developed software prototypes of 2D games and documented the games and the development process on a local wiki (Robolabwiki, 2013). Learning goals regarding wikis: The students should be able intuitively to understand the nature of a wiki and use the platform.

In practice, they should be able to present their games and development process on a wiki page. The students had three deadlines for updating their project wikis - one for each iteration of the development.

In the second semester the students used the wiki platform as a Wikipedia for portfolio assignments. The experiment was part of a course in digitally supported learning and teaching. Learning goals regarding wiki: The students should explore collaborative learning on wiki and they should become aware of its pros and cons.

In the first week of the experiment they had to initiate one article in the field of learning and in the second week they had to comment on two other articles. In the third week we did an e-mail interview. The questions were open-ended regarded both first and second experiment. The questions revolved around pros and cons of using wiki as a log; pro and cons on collaboration on articles; potential conflicts and ethical issues at stake.

We had normal classes once a week during the experiments and the assignments were introduced and discussed in the classroom.

4. First experiment: Wiki as log for game-programming project

The students uploaded three versions of their games. It was obligatory to introduce the game idea, add a screen dump from the game and requirements for version two. The third version should include scripting language or a test of another student's game.

The figure below shows a fragment of one of the project-log pages. The Contents-box in the top shows how most of the log pages were structured.

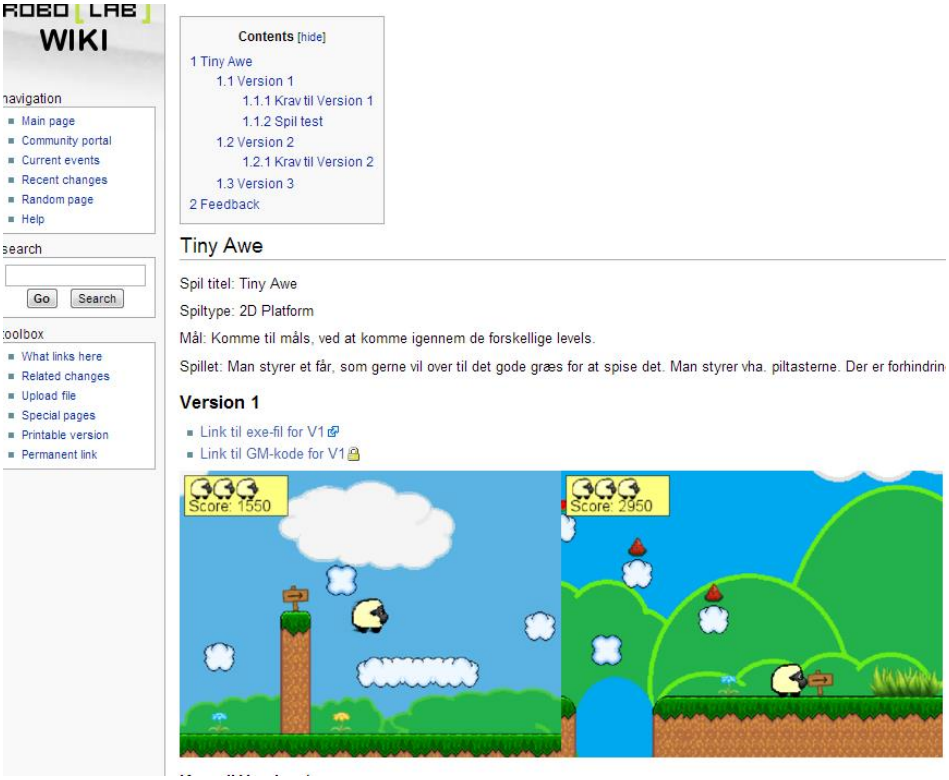

Figure 1.Fragment of a Project Log in Danish

Below are summarised some of the students' reflections on using the wiki as a game-programming-log. The reflections are based on the e-mail interview:

- *Inspiration and overview*. Most of the students found it motivating to see the other students' log pages. They got an overview of the variations in the games, ideas, programming level, status, and documentation level. One of the students wrote, "It was nice to see other people's ideas and become inspired. I think the way wiki pages can be set up makes it easier to get a log to look neat."
- *Problem solving*. The students looked at each others' specific source codes and this sometimes helped them to solve their own programming problems.
- *An open window as motivation*. The wiki was open to the world and to the other students. Most students found it motivating. One of the students wrote: "I think it was great to show my own game to others. It was, as if I had my work validated when we put on the wiki. It also helped us (at least me) to keep track of how things happened, and which potential errors should be corrected."
- *Show others your ideas and way of thinking*. The students had the possibility to put aside their modesty and systematically show others their ideas and thoughts. For some of the students it was a bit hard to present unfinished versions of their games and they had to overcome their modesty and sense of inadequacy. Some of the students would have preferred a less open environment.
- *Sharing the game design process.* Both the students and the teacher were able to follow the development process during the three iterations. And since it was first- semester students it was the first time most of them experienced iterative development.
- *The missing template*. It was a bit difficult for the students to decide how to structure their log pages. One of the students suggested a start-up-template.
- *Copy-paste*. The students could copy each other's code and game ideas; this was of course a disadvantage. From an educational point of view this was not a big concern since the students were examined orally. They had to be able to explain and expand on all relevant technical and theoretical concepts in the exam room.

5. Second experiment: Wiki as encyclopaedia for learning course

The students' wiki encyclopaedia was structured basically the same way as Wikipedia, see the figure below.

Figure 2. Fragment of wiki-encyclopaedia article on behaviourism in Danish

Below are some of the students' reflections on using the wiki as an encyclopaedia on learning:

- *Diving into the theory*. The students expressed themselves theoretically. They had to dive into other students' topics because they built on each others' contents and referenced to each others' contents. One of the students expressed that it was a great way to dive into what other students wrote and then add to it.
- *More diverse perspectives enriched the articles*. The students got more perspectives on the same theme. Oral and written dialog evolved the wiki page and enriched the students' perspectives on the topics. Adding and editing is also a kind of constructive feedback. One student expressed it like this: "... we all learn from each other, we work on each other's wikis, share our projects, progress, mistakes and knowledge. We learn from each other."
- *Emerging wiki structure*. The students reused or copied each other's page structure; this made it easier to get an overview of the articles. One of the students commented on this: "... several page settings are reused, and in this way we jointly created a way to use the wiki." The above Figure 2 exemplifies this structure. This structure was very similar to the structure in Wikipedia.
- *Interconnecting pages tied things together*. The linking between the articles linked together the different aspects of digitally supported learning. One of the students compared it to putting a puzzle together.
- *Student and teacher at the same time*. A student expressed his learning process like this: "We learn from each other and are even helping to teach each other. We are student and teacher at the same time."
- *Collaboration at a distance*. The students emphasized the possibility of working together without being together.
- *Incorrect information, messiness, and not being personally acknowledged could be demotivating*. The validity of the pages could always be questioned. The students might have misunderstood part of the theory or used invalid or poor references. Additionally, the overall structure and interconnection of wiki pages evolved gradually during the semester and this was of course a bit messy. It was also a bit complex to see who did what in the wiki history. This can of course be demotivating for some of the students.

The students also encountered and imagined several dilemmas as part of their collaborative learning process:

- *Rewriting and editing each other's contents*. The students generally did not like to rewrite other students' texts. On the other hand they had no problems adding text, links and other media.
- *Relevance and structure*. The students had different opinions on what was relevant and how to structure articles.
- *Different academic levels*. A large difference in academic levels could possibly make collaboration on wiki pages difficult and this could result in free rider situations.
- *Different ambitions and work ethics*. The students might have different ambitions and work ethics. One of the students mentioned that he preferred to make top quality assignments and if his team partner had a different view this could create tensions. He also stressed the importance of balancing ambitions ahead. Most students emphasized balance in work ethics as a crucial factor in group work.
- *Friendships versus academic achievements*. It was sometimes a hard process to express academic arguments if it potentially affected the friendships. Most students emphasized that being able to discuss and give feedback without incurring hard feelings was important for successful collaborative work. They used words as patience, confidence, empathy, responsibility, new perspectives and creative discussions when they described successful collaboration.
- *Ownership*. Who owned the article, the initiating party or the editing party? For some of the students this was difficult.

6. Findings and Discussion

6.1 Evaluation and discussion of the first experiment

The first experiment had its focus on logging the students' development projects. In the beginning the students found it somewhat complicated to use the special wiki codes and they had to upload the software prototypes on external hosting services such as Dropbox. We had to spend time during the lessons for short wiki instructions. From that point of view it was more technically complex to use wiki than handing in deliverables by e-mails or using the course management system.

Inspiration versus imitation. The wiki pages became windows for the other students. The students got inspired by each other's design ideas, thoughts and programming solutions. Their teacher encouraged them to observe how other students solved specific programming issues and use this as inspiration in their own programs. It was of course a dilemma if the students copied each other's hard work without a reasonable level of understanding. One of the students used the expression "no cuts, no buts, no coconuts" to describe this possible conflict between inspiration and copying. If a student as part of his learning process reuses code from a tutorial, it is acceptable, but if he reuses code from a fellow student, it is more problematic. From a learning point of view the wiki pages and the classroom formed a transparent community of practice. The practice was about learning fundamental game design and game-programming skills. The students presented their codes and game ideas both in the classroom and on the wiki pages. The students discussed in the classroom how they solved various problems and explained how their codes worked. For new programmers it is important to observe how other programmers work and reflect as part of their own learning process. Wenger names this as legitimate peripheral participation, and it is the initial stage of a programmer's active membership in a community of practice, to which he has access and the opportunity to become a full participant (Lave & Wenger, 1991). The virtual aspect of the community makes it transparent and the individual student can observe the process and progress in the programming community. Wenger describes the newcomer's observer position as a legitimate and valid way of entering a community. Observation including inspiration and imitation is a part of the initial peripheral participation and way of learning.

Publishing artistic work and overcoming modesty. The students developed homemade computer games. In many of the games graphics were developed by the students themselves. Several students

wanted their games to be on a certain level in order to publish it on the Wiki. So perhaps digital publishing can be used as a driver for the ambitious and creative students.

Co-creating or working in parallel? In a specific wiki page the entire class participated in the development of an overview of all the games. The page was structured as a table and each game had an entry. In the table they put student name, working title, abstract, game type, source of inspiration, and a link to the project logs. This structure made the students express themselves in parallel. But on the other hand they were very much aware what was going on in the other pages.

The missing focus in the educational didactics on co-creation became an important theme in the second experiment.

6.2 Evaluation and discussion of second experiment

The co-creation and co-construction worked very well from a didactical perspective. The students had to express themselves and they had to give each other constructive feedback. The inter-connective structure of the wiki also made most of the topics connect in new and constructive ways. This inter-connection especially evolved in the second week of the experiment where the students added to and edited each other's articles. The students included a lot of internal and external link in this phase. This type of learning fitted well the collaborative learning idea as a coordinated synchronous activity that is the result of a continued attempt to construct and maintain a shared understanding of a concept (Stahl, 2006).

Most of the students' reflections supported the idea of collaborative work on wiki pages enriched the learning process e.g. diving into the theory, diverse perspectives, inter-connecting pages, co-construction of knowledge and collaboration at a distance.

6.3 The social and ethical norms emerged in the co-creation and interaction on the Wiki

The students developed social and ethical norms for interaction and co-creation on the wiki.

A certain structure for setting up articles and connecting them to each other emerged during the second semester, for example content overview and definitions of concepts at the top of the articles, and references at the end. In the first semester a norm for visualization of design process evolved, see Figure 1.

In the first semester it became socially and ethically accepted to get inspiration from each other's evolving designs. The students discussed and explained their solutions but it was socially unacceptable to make blind copies.

There were also a lot of potential conflicts in the dilemmas: Inspiration versus plagiarism; academic achievements versus friendships; varying work ethics; varying academic levels; editing or adding to text. These dilemmas were potential conflict areas and they might have forced the students to work out solutions that involved compromises or strategies for coping. This was also a factor in the emerging social and ethical norms.

7. Summary and Conclusion

The first step towards mastering digital literacy is taken. We have now used wiki as a learning tool for the first-semester and second-semester students.

In the first semester we mostly used it as a lab book, for feedback, and as a window for the students. In the first-semester course we did not discuss philosophical ideas of participatory media, digital literacy, and digital citizenship. The students used the media without any planned reflections about the media in the classroom. The wiki log constituted a transparent community of practice in the field of programming and game design. The students developed norms for sharing and using knowledge, e.g. it was acknowledged to get inspiration but socially unacceptable to plagiarise.

In the second semester we used the wiki as a collaborative learning platform. We got a stronger focus on co-creation and received more benefits from this digital participatory community of practice. The students developed norms for collaborative co-construction of knowledge.

All in all, wiki is an expression of complex and co-creative working methods that require social and ethical judgments based on standards. And these standards emerge through the interactive construction of the wiki site. The students did not develop these competences through abstract reflection alone, but through actual participation and use of basic wiki techniques.

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CO-OPERATION AND ETHICAL PROBLEMS IN SOFTWARE INDUSTRIES: THE CASES OF VIETNAM AND NEPAL

Michiko Matsushita

Abstract
Many businesses in developed nations outsource operations to foreign countries where labour costs are much lower. For Japanese information and communications technology (ICT) companies, Asian nations are logical places to outsource. Although China is Japan's largest current outsourcing partner, Vietnam offers a viable alternative. Nepal is another potential candidate. ICT innovations reduce the gap between developed and developing countries, but the rapid and significant societal changes they bring can be problematic for outsourcing businesses. In this paper, we compare ethical issues seen in ICT companies in Nepal to those in Vietnam. We analyse how ethical problems within organisations relate to the degrees of maturity of the organisations and examine how the level of organisation within an outsourcing partner can affect co-operative efforts.

Keywords
Nepal, Vietnam, information and communications technology (ICT), co-operation, ethical problems

1. Introduction

Developed nations are always looking for other countries with cheaper and better engineers; developing countries continually strive for economic growth. Consequently, many businesses in developed nations choose to outsource operations to foreign countries where labour costs are low. However, because societies are changing very quickly, manufacturing technology is soon obsolete; thus, the comparatively slow development route followed by Japan and South Korea after World War II is no longer a feasible option for developing nations. Today, people in the major cities of even the poorest countries can use the Internet, mobile phones, and smartphones. These information and communications technology (ICT) media provide an excellent opportunity for the economies of developing countries.

1.1 Impact of the Internet and mobile phones

The 'smart revolution' is taking place in many countries, both developed and developing. The International Telecommunication Union (ITU) (2012) has reported that the number of mobile subscriptions reached 6 billion by the end of 2011. The price of broadband service dropped 75% globally between 2008 and 2011. ITU (2013) estimates that over 2.7 billion people will use the Internet in 2013. According to the Japanese Ministry of Internal Affairs and Communications (2012), data distribution increased more than sixfold from 8,714 Gbps in 2007 to 54,926 Gbps in 2011. The Internet and mobiles phones are making the world flat and impartial, presenting opportunities for citizens of developing countries that approach those of people in developed countries.

1.2 Importance of studying Vietnam and Nepal

Because of their individual characteristics, Vietnam and Nepal are important business partners for Japanese ICT companies. Vietnam is a rising nation and many investors are tracking its economic growth. Vietnamese stock is a popular investment for Japanese investors, second only to Chinese stock. According to the Teikoku databank (2012), 1542 Japanese companies have investments within Vietnam. The Japan External Trade Organization (JETRO) (2013) reported that Japan was the biggest

investor in Vietnam in 2012, and seven of the 10 largest investment events were executed by Japanese companies.

Nepal remains one of the poorest countries in the world, but the ICT situation in the capital Kathmandu has developed rapidly. Some foreign ICT companies focus on Nepal's proximity to the technology giant of India as well as its lower cost of labour compared to its Indian neighbour. Despite these advantages, almost all companies from Europe and United States had withdrawn their business in Nepal by 2004. Only Japanese companies have continued their joint efforts with Nepalese companies.

1.3 On-site research

Because obtaining statistics and information about Nepalese ICT industries is difficult from abroad, we travelled to Nepal in February 2003 and March 2004 to study the actual situations of software companies in Kathmandu. We visited 13 ICT companies, the Computer Association of Nepal (CAN), one press, one library, one hospital, the Embassy of Japan, the Nepal office of the Japan International Cooperation Agency (JICA), and two universities.

Our research in Vietnam took place in February and March 2001 and August and September 2009 in Ho Chi Minh City. In 2001, we visited JETRO's office, one Japanese computer company, one university, and a national construction and building material company. During a follow-up visit in 2009, we visited eight ICT companies, one software park, one industrial area, one high technology building, and two Japanese firms.

2. ICT outsourcing

Outsourced ICT services range from manual data input to development of extensive information systems. Some companies use overseas firms to manage or control their network server in order to achieve 24-hour support service. The most important reason for ICT outsourcing is to cut personnel expenses and to secure additional human resources. Almost all ICT companies in developed nations seek large numbers of young labourers who will work for relatively low wages and therefore look abroad to find a workforce that will suit their needs, particularly to Asian contracting firms. More than 50% of the market for business process offshoring has moved to India, the Philippines, and China since 2006 (UNCTAD, 2010, 50, Figure III.5). Thailand and Sri Lanka joined the ranks of offshore locations in Asia in 2009, and outsourcing to Latin America (Argentina, Brazil, Costa Rica, and Mexico) and Africa (Egypt, Mauritius, Morocco, and South Africa) increased between 2004 and 2009. In 2009, the number of Japanese offshore jobs exceeded 10,000 [ibid., 49].

2.1 ICT outsourcing from Japan to other Asian countries

Research conducted by the Information-technology Promotion Agency (IPA) of Japan reveals that the amount of offshore software development by Japanese ICT companies rapidly increased until 2008 but dropped off 8% in 2009. The amount in 2010 was estimated at ¥95 billion, constituting about 105% of the previous year [IT HRDH, 2012, 121]. Based on the number of companies operating within them, China, Vietnam, India, and the Philippines are the four most significant partners of Japanese ICT companies [ibid., 124].

Outsourcing to China

China is the most important location for Japanese ICT outsourcing; about 80% of Japanese ICT companies outsource to China to make up for shortfalls in the availability of human resources in Japan [ibid., 124]. Figure 1 shows that 67.6% of outsourced Japanese ICT business in 2010 was to China. Figures 2 and 3 show trends in Japanese outsourcing from 2007 to 2010. However, the amount of business done by Japanese companies in China decreased from 2009 to 2010. The main business performed by Chinese workers for Japanese ICT companies are detail design, programming, program testing, and integration testing [ibid., 131].

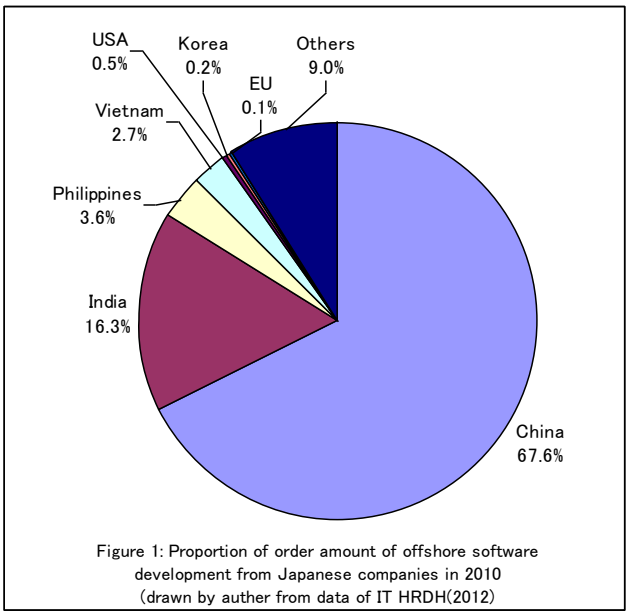

Figure 1: Proportion of order amount of offshore software development from Japanese companies in 2010 (drawn by auther from data of IT HRDH(2012)

Outsourcing to India

India is the second largest recipient of Japanese ICT offshoring based on money spent (Figure 1). Over 50% of Japanese ICT companies indicated that they outsource to Indian and Philippine companies to globalise their businesses. The types of business outsourced to Indian companies are similar to those sent to Chinese companies, but the rate of basic design is higher for Indian firms. The ratio of integration testing decreased about 25 points from 2010 and the rate of research and development increased slightly [ibid., 131].

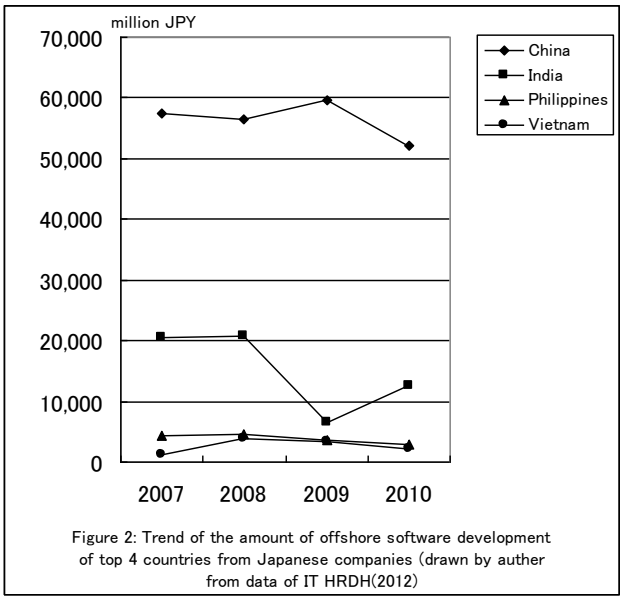

Figure 2: Trend of the amount of offshore software development of top 4 countries from Japanese companies (drawn by auther from data of IT HRDH(2012)

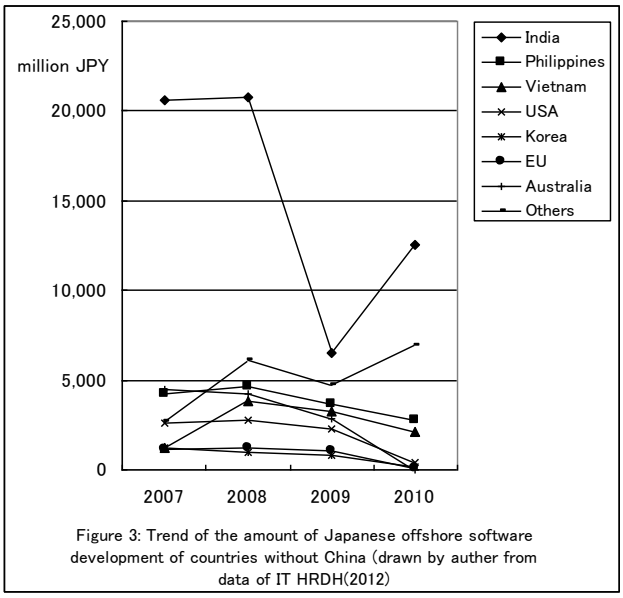

Figure 3: Trend of the amount of Japanese offshore software development of countries without China (drawn by auther from data of IT HRDH(2012)

Outsourcing to Vietnam

Vietnam had the fourth largest amount of offshore development in 2010 based on the number of Japanese ICT company responses (Figure 1). The main areas of business sent to Vietnamese companies were detail design, programming, and program testing [ibid., 131].

Outsourcing to the Philippines

As was the case with China, Japanese outsourcing to the Philippines is primarily driven by the lack of sufficient human resources in Japan. The main types of work sent to Philippine companies were detail design, programming, program testing, and integration testing [ibid., 131]. Despite the high rate of integration testing outsourced to the Philippines, satisfaction with the technical level of work performed in the country is much lower than the three nations discussed above [ibid., 132].

2.2 Problems between businesses from developed and developing countries

Although there is a large amount of business between developed and developing countries, there are also problems. Not all offshore development projects are proceeding successfully. Challenges stem from the fact that though developing countries may have well-functioning information technology environments, other aspects of the business environment, such as economic, political, legal, educational, and cultural factors as well as differing business styles, may present obstacles. For example, the empirical level of co-operation in the organisation influences the level of ethical skill.

In this study, we analyse and compare ethical problems experienced by Japanese ICT companies outsourcing to Nepal and Vietnam.

3. ICT in Vietnam and Nepal

The United Nations Conference on Trade and Development (UNCTAD) (2011) classifies nations into three levels based upon the extent to which ICT policies cover private sector development: high, medium, and low. In the regions of Asia and the Pacific Rim, high-level countries include Australia, China, India, Japan, Malaysia, New Zealand, the Republic of Korea, Singapore, and Taiwan. Vietnam is included in the medium category and Nepal is in the low category. On the technical front, the average download speed in Vietnam is at the world average of about 6 Mbps. The average download speed in Nepal is below 1 Mbps, among the worst in the world [ibid., 30]. The specific situations of Vietnam and Nepal are discussed in greater detail below.

3.1 Vietnam

Vietnam (Socialist Republic of Vietnam) is a socialist country governed by the Communist Party of Vietnam but using a capitalist economic system named 'Doi Moi'. Recently, Vietnam has been one of the rising nations in Asia. In 2011, GDP per capita was US$1374, and the GDP growth rate was more than 6% from 2010. However, average life expectancy remains low. In the business arena, organisational experience is lacking, and experienced middle management personnel are not abundant.

ICT development

ICT development within Vietnam can be traced from 1995, the year of the 'IT2000' project. This well-known effort promoted an information-oriented society with open and application-oriented systems that would be achieved by transferring suitable technology from developed nations until 2000. Despite the initial promise of the project and significant foreign investment resulting from it, the budget has decreased from year to year, yielding lesser results than were initially envisioned.

On the legal front, a High Technology Law was enacted in Vietnam in July 2009, but a Personal Information Protection Law has not yet been established.

According to the 2012 Vietnam ICT white paper (Ookata, 2012), the number of mobile subscribers and Internet users has consistently increased in the country (Figure 4), whereas the number of broadband Internet users skyrocketed between 2010 and 2011. (Figure 5) Ookata (2012) also reports an explosion of domain name registration within Vietnam between 2010 and 2011, with a 100-fold increase during that period.

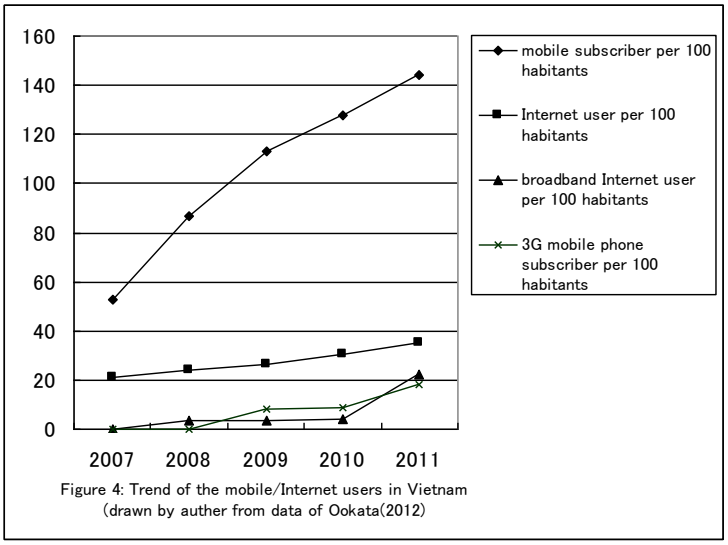

Figure 4: Trend of the mobile/Internet users in Vietnam (drawn by auther from data of Ookata(2012)

ICT industries

Vietnam's ICT industries form a significant amount of the country's economic activity, with the centre clearly located in the capital, Ho Chi Minh City. The total IT sales for Vietnam in 2011 were US$13.663 billion. Of this amount, sales in Ho Chi Minh City accounted for US$4.538 billion, representing 33.21% of the total and 18.37% of the GDP (US$24.709 billion) (Ookata 2012). Total software sales in 2011 were US$1.172 billion, with US$333 million (28.41%) of those sales taking place in Ho Chi Minh City. Digital content sales in Ho Chi Minh City total US$158 million, 13.56% of the total for the country (US$1.165 billion). Nineteen companies provide system integration services in Ho Chi Minh City, with total annual sales of US$243 million.

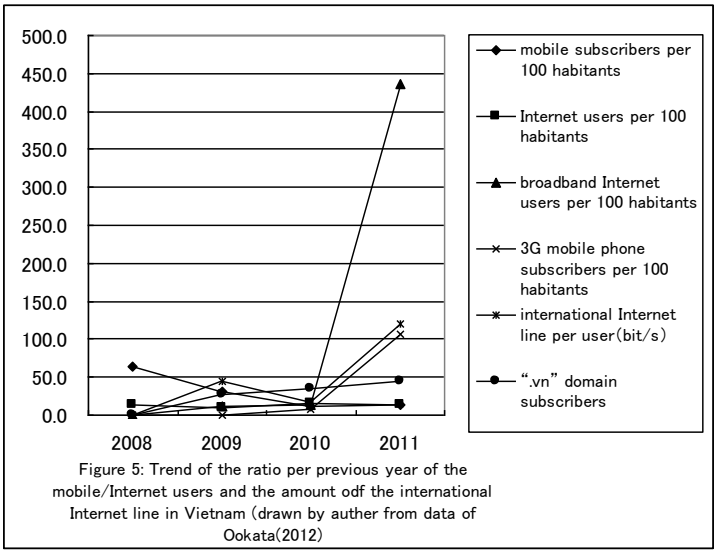

Figure 5: Trend of the ratio per previous year of the mobile/Internet users and the amount odf the international Internet line in Vietnam (drawn by auther from data of Ookata(2012)

3.2 Nepal

Nepal (Federal Democratic Republic of Nepal) is one of the world's least developed countries and has no valuable industry apart from Himalayan tourism, high land, and jungles. In 2005, 55% of its population lived on less than US$1.25 (Purchasing Power Parity scale) per day. However, in the capital Kathmandu, residents have some access to ICT as many industrial products, including personal computers (PCs), are imported from India and other Asian countries. In addition, Nepalese and Indian citizens can live and work in either country without restrictions. Because of Nepal's proximity to India, companies from Japan, the United States, and the European Union have shown interest in Nepal's potential for ICT outsourcing over the years.

Although Nepal's terrain makes fixed ICT lines difficult to install, mobile phones are popular in both the urban area of Kathmandu and more rural mountainous regions. Many Sherpas communicate with their customers (climbers) using mobile phones and e-mail. TeleGeography (2011) reported that the total number of fixed and mobile lines in service exceeded 13.513 million, a penetration rate of 47.27% of the Nepalese population as of the month ending 14 August 2011 (Shrawan 2068 of the Nepalese calendar).

Infotech and IT conference

Each year, CAN hosts a trade fair or products presentation for its membership called Infotech. From 2000 the IT (ICT) conference, organised jointly by the Internet Society (ISOC) Nepal Chapter and CAN, has been added to the Infotech event. The theme of the 2012 conference was 'The Internet is for everyone'. In 2013, the conference theme was 'Promoting e-Democracy in Nepal', and presentations focused on infrastructure for e-democracy and emerging technologies, security of e-democracy channels, changes in democratic practice resulting from e-participation, and freedom of expression in digital societies. The conference also featured a panel discussion on e-parliament and citizen journalism. The content of the conference, with its focus on e-democracy, appears to indicate Nepalese aspirations to participate more fully in the ICT area.

4. Ethical problems arising in co-operative efforts of Japanese ICT companies in Vietnam and Nepal

ICT outsourcing is not without risk. As Hanseth (2007) said, increased integration leads to increased complexity, and increased complexity leads to increased risks. Even without the added complexity of outsourcing, the ICT industry has risks. Outsourcing projects naturally add complexity and consequently increase risk.

Generally, organisations within developing countries are weaker than those in developed nations. We analyse how ethical problems within organisations relate to the degree of maturity of the organisations; the level of organisation within an outsourcing partner can also affect co-operative efforts. Rapid industrial and economic growth causes significant social strain in developing countries, as the speed and degree of education and legislation about management of information cannot keep pace with industrial and social change. Ethical shortcomings in business will affect outsourcing projects from developed nations as well as the success of economic growth. Adjustment of legal and education systems pertaining to information is necessary for developing countries that wish to provide widespread ICT outsourcing services.

4.1 Vietnam

As a result of the Vietnam War from 1960 to 1975, there are few elderly people in Vietnam, thus making the average national age quite low. As a country with a primarily young population, Vietnam has significant potential, but the lack of experienced persons in all organisations presents a challenge for Vietnamese businesses.

Lack of a management model

Vietnamese companies are young and unfortunately do not have many manager role models. This reality presents difficulty for Japanese CEOs of Japanese-Vietnamese joint companies. Some companies have attempted to address the situation by using a Japanese manager who can speak Vietnamese rather than a Vietnamese manager; however, these persons often do not have sufficient knowledge about ICT to manage the organisation properly. Others have educated young Vietnamese managers using a Japanese model of management. Hopefully, a cadre of Vietnamese managers will be produced in next 10 years, thus solving this problem.

Ethics

Vietnamese culture is similar to Japanese culture; importantly, ethics within the two cultures are almost identical. Japanese people working with Vietnamese counterparts rarely experience difficulty on this front.

Law and ICT

The legal landscape for ICT has not undergone significant development in Vietnam. However, an act governing intellectual property most recently revised in 2010 pertains to areas related to ICT, such as copyright, industrial ownership, and invention. A high-technology law passed in 2008 took effect in 2009 but has not yet been tested.

4.2 Nepal

The social, economic, and legal systems of Nepal are still nascent, presenting risks to ICT outsourcing projects.

Hardware and software issues

Reliable statistics on PC sales are difficult to obtain in Nepal. The main street of Kathmandu contains some PC shops, but few carry stock. Instead, product packaging is displayed, and PC sets are generally assembled after the customer places an order. Parts are imported from India or other Asian countries formally or informally. These assembled PCs are less expensive but of poorer quality than their counterparts in other countries.

In addition, Nepalese companies often have a short lifespan; company directors struggle with organisational development. Sometimes when a key person retires from one company and forms a competing company, the former sees a fall in business. When any company shuts down, its PCs are resold to anyone, exposing information or data stored on the hard disks to compromise.

Further, there are significant problems with information management and personal information protection in Nepal. Small companies and individuals often use illegal copies of software rather than pay for more costly legal products. They usually do not install anti-virus software, leading to a high

risk of virus infection via the Internet. Any ICT company seeking to gain outsourcing work from companies in the European Union, the United States, or Japan will need to use legitimate software products and anti-virus software.

Law and ICT

The Nepalese legal system is incomplete. The establishment of new constitution has caused a rocky legal path for the last several years, and copyright protection within the country is difficult.

Ethics of Nepalese ICT workers

Nepalese ICT employees are unlikely to appropriate business data, unlawfully or otherwise, as few have sufficient resources to purchase their own PCs. Many companies work in shifts, so PCs and desks are shared by several workers. Workers report empty-handed, and work desks are empty save for the office PC. Furthermore, Nepalese ICT workers employed in data input operations have no private means to utilize digital information. In fact, there are many excellent IT engineers and general managers in Nepalese companies, but the legal system and the unstable political situation present serious obstacles for foreign partners.

4.3 Comparison of Nepal and Vietnam

The characteristics of Vietnamese and Nepalese employees differ as a result of different customs and cultures within the two countries.

Organisational behaviour

Vietnamese employees are generally cooperative. They naturally share important information with their professional colleagues. By contrast, some Nepalese workers have been reported to prevent co-workers from accessing business information. A Japanese CEO engaged in a joint company in Nepal must strive to educate the Nepalese staff on the importance of communication and information sharing.

Management style

Many young Vietnamese employees have not had the opportunity to experience global business management. By contrast, Nepalese business persons have often worked with international volunteer organisations with strong leadership. Though Nepalese managers are typically adept at exercising their authority, employees at lower levels do not seem to display strong loyalty toward their employers. For these reasons, managing an organisation of more than 40 persons will be challenging in both countries.

5. Conclusion and future study

In this paper, we compare the ethical problems of Nepal's ICT companies to those in Vietnam. We analyze how the ethical problems in the organisations relate to the degrees of maturity of the organisations as well as the effect of the level of organisation on the ability to engage in co-operative projects. Rapid industrial and economical growth has caused strain in these countries. The speed and degree of education and legislation about management of information cannot keep pace with industrial and social change. Ethical weakness in business will affect outsourcing projects from developed nations as well as prospects for economic growth. Preparation of legal and education systems of information is necessary for developing countries. Further study is necessary to identify workable solutions in this important area of global business.

Acknowledgements

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PRIVACY, RISK AND PERSONAL HEALTH MONITORING

Brent Mittelstadt, N. Ben Fairweather, Neil McBride and Mark Shaw

Abstract

Personal health monitoring (PHM) systems capable of gathering pervasive physiological and behavioural data are currently in development to supplement existing medical resources. As a technology designed to operate in the private sphere, PHM can digitise, record and analyse the lives of patients, creating opportunities for data sharing, mining and social categorisation. Medical care and health outcomes may be improved through increasingly granular monitoring and personalised interventions, but these outcomes may come at the cost of user privacy and related ethical implications. As an emerging technology, the opportunity remains to proactively respond to the potential normative risks of a PHM-enabled future. In this paper, a critical overview of the treatment of privacy, risk and PHM in academic literature is offered. The current discourse is defined by a conceptually narrow definition of privacy among developers of PHM systems and security architecture, which suggests that emerging PHM systems may fail to meet the context-specific privacy expectations of users.

Keywords

ethics, privacy, risk, security, trust, personal health monitoring, PHM, pervasive health, wearable health, health surveillance, smart home, literature review

1. Introduction

Personal health monitoring (PHM) systems are being developed to supplement medical care with health monitoring outside traditional care environments such as hospitals. The primary factors spurring the development of PHM are the benefits for patients associated with health monitoring at home (c.f. Neild et al., 2004; Ure et al., 2012), and the need to supplement existing medical resources to address the needs of an aging population (Agree et al., 2005; Remmers, 2010; Sadri, 2011; Stuart et al., 2008). Systems are being developed for a range of demographics, with many targeting the elderly and chronically ill.

PHM refers to any electronic device or system that monitors and records data about a health-related aspect of a person's life outside a hospital setting. To qualify as PHM a device must be capable of transferring data to a third party, and be usable by a layperson outside a traditional medical environment such as a hospital. Examples include smart home systems (Demiris and Hensel, 2009) and physiology-sensing 'smart clothes' (Lymberis, 2005). Emerging PHM applications cover a range of tasks within healthcare and public health monitoring, including prevention, treatment, assistance and rehabilitation, as well as occupational and recreational health monitoring (PHM Ethics Consortium, 2012a). Within these areas PHM applications have a range of purposes including longitudinal data monitoring, pattern recognition and diagnosis, lifestyle feedback, and anomaly and emergency detection (PHM Ethics Consortium, 2012b).

PHM is designed to operate within the private sphere. Devices can be carried with the user or installed in private environments, such as the home, creating a public window into private life. The lives of users can be digitised, recorded and analysed by third parties, creating opportunities for data sharing, mining and social categorisation (c.f. Lyon, 2003). These basic functions may improve healthcare through increasingly granular monitoring and personalised interventions, yet they simultaneously create an opportunity for violating user expectations of privacy and related risks. As an emerging technology, the opportunity remains to proactively respond to the potential risks of a PHM-enabled future. However, anticipatory action requires understanding the normative potential of PHM (Kastenhofer, 2011) according to developers, regulators, academics and potential users. To this end, a critical assessment of current academic literature discussing privacy, risk and PHM was

conducted. Gaps in the discussion and conceptual deficiencies were identified, which revealed areas in need of acknowledgement in the development and governance of PHM.

2. Methods

Peer-reviewed articles, reviews and conference proceedings available in four databases (Scopus, IEEE, MEDLINE, and ISI Web of Knowledge) addressing privacy or risk and PHM were reviewed between May and September 2012. The search was without date restrictions, but limited to English language sources.

2.1 Procedure

Sources were located through systematic searching of the databases as well as hand searching and reference tracking. Multiple search techniques were used to ensure comprehensiveness. Recognising 'personal health monitoring' is an emerging term not yet widely used in the literature (Mittelstadt et al., 2011), synonymous and related search terms were used including 'somatic surveillance', 'wearable body sensors', 'pervasive health', 'assistive technologies', 'ambient intelligence', 'health surveillance', 'ambient assisted living', and 'smart home'. All sources were checked to ensure the technology under discussion matched the working definition of PHM, and that a discussion of privacy issues or risks was included.

2.2 Justification

PHM applications often share technological characteristics with ambient intelligence (AmI) and ubiquitous computing (ubicomp) (Bohn et al., 2005). The search technique was designed to limit the results to health applications. It is recognised that privacy issues and risks of non-medical applications of AmI and ubicomp may be relevant to PHM.[1]

The search method was chosen to identify articles explicitly addressing privacy issues and risks of PHM. The results expanded upon a prior literature review of ethical implications of PHM (Mittelstadt et al., 2011), in which privacy was identified as a major theme. Given the frequency with which privacy appears in discussions of ethics of PHM, it was deemed appropriate to conduct a separate review to develop a fuller understanding of its meaning and usage within discourse on PHM. 'Risk' was also added to the search terminology on the basis of criticisms at ETHICOMP 2011 of the prior review, which suggested normative dimensions of emerging technologies are often discussed in terms of 'risk', and evaluated through 'risk assessments', without any mention of ethics.

2.3 Data Analysis

All articles underwent content analysis to develop a narrative overview of treatments of privacy and risk. Key terms were identified, interpreted and combined into themes present across multiple articles in a process analogous to grounded theory (c.f. Strauss and Corbin, 1994). Words and passages were highlighted that appeared to refer to privacy, risk, or normative claims. Highlighted segments were coded. Similar codes were assigned to themes. The frequency with which codes appeared was used as a starting point for discussion of results.

3. Results

A total of 527 articles were identified for review, 81 of which met the inclusion criteria of explicitly discussing aspects of privacy or risk and PHM. Of the reviewed literature, 33 sources discussed designing a PHM system or underlying security or privacy architecture, 20 were empirical studies into

[1] For a discussion of ethical aspects of AmI and ubiquitous computing, See: (Bohn et al., 2005; Brey, 2005).

user, family or professional attitudes towards PHM, 12 reviewed literature about privacy, risk or security aspects, nine were theoretical analyses or conceptual discussions, five analysed normative dimensions of future scenarios of PHM usage and two were risk assessments. The following sections present a narrative overview of the literature, divided into conceptual themes which emerged. Two general types of privacy emerged: information privacy and personal privacy.

Before proceeding with the overview, definitions are required for terms used in presenting the results. The creators or subjects of data (e.g. who the data is 'about)' are denoted as 'users'. This title highlights the interaction between persons and PHM systems, which creates the data affecting privacy. Persons or organisations that handle the data once created are referred to as 'data custodians'. Other stakeholders include the rest of the parties who interact with or possess a claim to the data. For simplicity they are referred to as 'stakeholders'. A 'misuse' of data is any use (e.g. searching, analysis, comparison) to which the user has not consented.

3.1 Information Privacy

A majority of the reviewed literature focused on aspects of controlling and disseminating data about oneself. Information privacy was interpreted as the right to control data about oneself and limit third-party access (c.f. Chan et al., 2009; Demiris, 2009; Jea et al., 2008; Mitseva et al., 2008; Mittelstadt et al., 2011; Tentori et al., 2006; Tiwari et al., 2010; Van De Garde-Perik et al., 2006; van Hoof et al., 2007). At its narrowest, information privacy was equated with hiding personally identifiable information from unauthorised parties (Ahamed et al., 2007b; Garcia-Morchon et al., 2011), and was seen as quantifiable (Srinivasan et al., 2008). Concerns over data control were common among participants in empirical studies (Coughlin et al., 2007; Courtney, 2008; Little and Briggs, 2009; Melenhorst et al., 2004; Wilkowska et al., 2010). Unauthorised access or identification of the user may be prevented through anonymisation at data collection (c.f. Agrafioti et al., 2011), with access policies allowing chosen actors access to identifiable data (Bagüés et al., 2007b; Garcia-Morchon et al., 2011; Subramaniam et al., 2010) for acceptable purposes (Beaudin et al., 2006; Chakraborty et al., 2011; Massacci et al., 2009). Transparency of relationships between data collected and purposes of collection is central to protecting privacy of users (Giannotti and Saygin, 2010), who make decisions regarding acceptable uses.

Information privacy empowers users to control the information revealed to others about themselves, limiting opportunities for unwanted disturbances and exploitation, caused by an information imbalance. Information enables regulation, behavioural control and social sorting by those with greater access (Kosta et al., 2010), so controlling information flow enhances dignity, autonomy and privacy. Thus, information privacy acts as a check on the power of organisations and data custodians (Friedewald et al., 2007; Moncrieff et al., 2009). Risks associated with uses of personal data beyond those found acceptable (or consented to) by users require "strict guidelines of confidentiality" to prevent unwanted personalised marketing and personalised insurance premiums (Kosta et al., 2010; Percival and Hanson, 2006), or exclusion or discrimination against (non)users wishing to limit access to their personal data (Brey, 2005). To limit possibilities of data misuse and come closer to an ideal of informed consent, information about temporal limitations and purposes for data use need to be available to users before data gathering (Kosta et al., 2010).

Despite empowerment attached to information privacy, absolute control over personal data may not be a necessity for PHM to be accepted by users. Empirical studies into attitudes towards PHM revealed a preference to forego information privacy in emergency situations (Rashid et al., 2007; Steele et al., 2009), which highlights the need to find a balance between the desire to control data and enjoy the benefits of services which require that data. A similar balance is expressed in preferences towards PHM for data gathering over human intrusion into the home (c.f. Essén, 2008). User-end policies have been proposed as a solution which allows users to pre-define a customized level of privacy meeting their expectations (Friedewald et al., 2007; Garcia-Morchon et al., 2011; Massacci et al.,

2009).[2] Privacy tools such as these are said to enable users to freely move between and interact with a range of PHM systems without negotiating individual privacy agreements, while respecting the necessity of informed consent (c.f. Bagüés et al., 2007b).

Security

Although not explicitly searched for, security emerged as a theme in information privacy literature. Privacy and security were frequently conceptually interchangeable (c.f. Ahamed et al., 2007a; Armac et al., 2009; Busnel and Giroux, 2010; Chan et al., 2008; Dhukaram et al., 2011; Elkhodr et al., 2011; Garcia-Morchon et al., 2009; Mana et al., 2011; Stuart et al., 2008; Wang et al., 2008); ensuring system security through appropriate frameworks and encryption algorithms was taken to guarantee user privacy. The concepts can be differentiated by their ends: security is concerned with guaranteeing the *quality* of the data collected by and passing through a system in terms of "confidentiality, integrity and availability" (Giannotti and Saygin, 2010), enabling users to protect *privacy* by controlling dissemination of personal data. Under this distinction, security mechanisms may alert a user to unrecognised flows of information between systems and stakeholders (Moncrieff et al., 2009), which could be limited to respect the user's information privacy.

Security risks were defined in terms of interception, modification and falsification of sensor data (Acharya and Kumar, 2010; Lim et al., 2010), and authentication scheme (Giannetsos et al., 2011; Massacci et al., 2009; Subramaniam et al., 2010).[3] Security frameworks including key management schemes, encryption algorithms and (actor-based) authentication mechanisms were seen as protecting the confidentiality, integrity and flow of information passing through PHM systems (Acharya, 2010; Chan et al., 2009; Fragopoulos et al., 2010; Giannotti and Saygin, 2010).[4] In these terms, security features protect a user's ability to control and trust his data—the conceptual confusion seen in the reviewed literature is therefore unsurprising.

Trust

Trust, understood as a security concept, emerged in the reviewed literature as necessary component for PHM systems to be seen as 'privacy enhancing' (c.f. Bagüés et al., 2010; Chakraborty et al., 2011; Coughlin et al., 2009; Dhukaram et al., 2011; Rashid et al., 2007; Wang et al., 2008; Yuan et al., 2007), when privacy is interpreted as control over personal data. Trust is defined in the context of information privacy as an interaction between a system which collects and processes data, users which provide the data, and stakeholders who access it. A lack of trust in a system has been linked to reluctance among potential users to use systems (Brey, 2005; McLean, 2011). Users 'place trust' in systems and stakeholders to handle their data responsibly, which facilitates and secures data sharing (Bagüés et al., 2010; Kosta et al., 2010; Little and Briggs, 2009). Trust can be understood as a sum of the credibility, motivation, transparency and responsibility of a system. Credibility is linked to 'loyalty' or 'reputation' (Little and Briggs, 2009; Rashid et al., 2007); a stakeholder must be seen as responsible or credible enough to handle sensitive personal data. Motivation refers to the intentions of stakeholders, or how they intend to use the data of users. Monitoring of parameters or putting data to uses beyond those explicitly agreed upon by users was taken to undermine trust. These motivations, and intended uses of data, should be transparent to users, as should the sum of data collected and held about them. To achieve trust, systems must allow users to review and control their data.

[2] User ownership of personal data has also been suggested as a solution to data mining risks presented by PHM (Pentland, 2009); this solution would, however, present a significant barrier to the realisation of legitimate commercial and research interests, and would require sophisticated legislation detailing appropriate third party uses of personal data without the explicit consent of the data owners.

[3] An extensive review of technical security risks is provided by Armac et al (2009).

[4] Confidentiality refers to limiting access to data to stakeholders with authorisation (Giannetsos et al., 2011; Giannotti and Saygin, 2010).

3.2 Personal Privacy

Personal privacy describes aspects of privacy not directly related to control of data. Personal privacy was interpreted to mean the right to be left alone or not monitored by a third party (c.f. Demiris and Hensel, 2009; Dorsten et al., 2009; Mittelstadt et al., 2011; Pallapa et al., 2007; Wilkowska et al., 2010), which affects feelings of intimacy and control over 'private space' (Gaul and Ziefle, 2009; Ziefle et al., 2011).[5] Personal privacy can also be understood as a freedom, to "escape being observed or accessed when desired" (Essén, 2008), implying a social duty to respect the desire for isolation of others. The introduction of PHM may cause a gradual loss of personal privacy (Steele et al., 2009), particularly among smart home systems (Coughlin et al., 2007; Demiris, 2009; Dorsten et al., 2009). Monitoring technologies can create a psychological disturbance, sometimes called obtrusiveness (c.f. Hensel et al., 2006; Nefti et al., 2010), expressed in a feeling of 'being watched'; certain technologies, particularly cameras (Caine et al., 2006; Demiris et al., 2004; Leone et al., 2011; Stowe and Harding, 2010; Tiwari et al., 2010; Zwijsen et al., 2011), produce greater perceived violations of personal privacy in this regard.

Personal privacy is a multifaceted concept, defined by interactions between social individuals, ICT and the natural world. As seen in the reviewed literature, personal privacy includes:

- **Physical Privacy** – Physical accessibility of a person to others, defined by physical borders, such as doors and walls (Bowes et al., 2011; Brey, 2005; Essén, 2008; Little and Briggs, 2009). This can also be interpreted as a right to possess and protect personal space (Kosta et al., 2010), such as a home.
- **Social Privacy** – Control over social interaction through geographical distance, group membership and location. It is connected to physical privacy (Bagüés et al., 2007a; Coughlin et al., 2007; Little and Briggs, 2009), and can contribute to social isolation.
- **Decisional Privacy** – Absence of undesired interference from others in making decisions (Bowes et al., 2011; Essén, 2008). Decisional privacy enables the expression of autonomy.

Physical and social privacy are placed at risk by PHM capacities to transmit data to third parties (Brey, 2005; Friedewald et al., 2007), or move personal data past privacy protecting natural, social, spatial, temporal, ephemeral and transitory borders (c.f. Marx, 2001). PHM increases the interconnectness of users and stakeholders through data sharing which blurs the boundaries between 'public' and 'private' spaces and data.

Decisional privacy is placed at risk by monitoring when interpreted by users as a form of electronic surveillance; awareness of monitoring can affect behaviour (Essén, 2008), especially risk taking among seniors (Percival and Hanson, 2006; Remmers, 2010) which can represent a desire to retain independence at home, despite safety risks. Monitoring may also lead to 'labelling' of users as 'health impaired' or 'at-risk' (McLean, 2011; Percival and Hanson, 2006; Rigby, 2007), further limiting behavioural freedom (Kosta et al., 2010). Alternatively, the user's home may be increasingly freed from external interference by reducing the need for carer visits. Whether this outcome is desirable, particularly among the mentally impaired and physically frail, remains a question of appropriate balances between safety, autonomy and self-determination (c.f. Remmers, 2010). The need for 'self-care' among users can also be reduced by violations of decisional privacy, if for example PHM takes the decision to call for help out of the hands of the user (Bowes et al., 2011). In this case, user privacy is violated through automatic sharing of personal data, which causes intrusion of a third party into a user's private space.

3.3 Information and Personal Privacy Overlap

[5] The distinction between personal and information privacy was not always upheld in the reviewed literature, with control over dissemination of personal information occasionally understood as a form of personal privacy (c.f. Bagüés et al., 2010).

The conceptual distinction between information and personal privacy is not always clear. By controlling the dissemination of personal information, a person may be spared future physical, social and decisional disturbance from third parties, such as friends, family and service providers (c.f. Friedewald et al., 2007). Many privacy risks described in the literature cannot clearly be separated into information or personal privacy. For example, the visibility of a PHM system to others can cause the user to experience stigma (McLean, 2011), because the device's visibility transmits information to others without the user's consent, while also influencing behavioural and decisional freedom in public.

Technological 'Need' and Privacy

Monitoring is understood to inherently raise questions of privacy, but potential violations can be justified on the basis of 'need' for the technology, derived perhaps from safety concerns related to health (Steele et al., 2009; Zwijsen et al., 2011), or to delay a move to residential care (Essén, 2008; McLean, 2011; Remmers, 2010; Townsend et al., 2011). This type of 'tradeoff' demonstrates the potential for PHM to simultaneously violate and enhance privacy. A tradeoff was often presented between personal privacy and safety, particularly among the mentally impaired (Landau et al., 2010; Ojasalo et al., 2010; Stowe and Harding, 2010), as well as frail elderly (Courtney, 2008; Courtney et al., 2008; Melenhorst et al., 2004; Steele et al., 2009) and chronically ill persons (Neild et al., 2004; Salih et al., 2011). In this context, it was suggested that personal privacy could be simultaneously enhanced by reducing need for carer or family visits (Essén, 2008; Ojasalo et al., 2010), but reduced by the presence of a monitoring device invading the user's 'private' sphere. In community care situations, personal privacy is typically desired with regard to other patients, rather than carers. However, in the home the opposite is true (Essén, 2008); freedom from professional carers enabled by PHM can increase the tradeoffs, in terms of privacy, autonomy and other ethical values, that are seen as acceptable. These tradeoffs may be seen as a necessary part of aging, with increasing susceptability to health problems (Steele et al., 2009), though this view should not be applied generally to associate 'aging' with reduced expectations of privacy, or to justify increased privacy violating interventions.

3.4 The Absence of Risk

"Privacy" and "risk" were treated as independent concepts in the search terminology. Initial expectations were that 'risk' would prove to be a robust concept, revealing ethical and social dimensions of PHM beyond those identified in the previous literature review (Mittelstadt et al., 2011), given that risk is often used as a generic term to refer to the normative dimensions of (emerging) technological artefacts (c.f. Busnel and Giroux, 2010; Hilty et al., 2004; Kastenhofer, 2011; Morris, 2000). The discussion of risk in the reviewed literature is limited almost exclusively to privacy and security implications (Lim et al., 2010; Nefti et al., 2010; Pentland, 2009; Sadri, 2011) or risk taking behaviours of seniors (Percival and Hanson, 2006; Remmers, 2010). Risk was rarely conceptualised as a future-oriented concept, as seen in risk assessments of future scenarios (c.f. Friedewald et al., 2007; Kastenhofer, 2011). The inclusion of 'risk' as an independent concept did not contribute content beyond themes addressed. The exception was a risk assessment identifying normative aspects of pervasive computing including environmental and human effects of non-ionizing radiation, stress imposed on users, restriction of consumers' and patients' freedom of choice, threats to ecological sustainability, and dissipation of responsibility in computer-controlled environments (Hilty et al., 2004).

4. Discussion

PHM privacy discourse, represented in the reviewed literature, overwhelmingly addresses protection of information privacy through security measures, while dedicating far less attention to the importance of personal privacy and context-specific norms (c.f. Nissenbaum, 2004). This finding is especially true of sources discussing the development of PHM systems and underlying security architecture, of which only three mention aspects of personal privacy (Bagüés et al., 2007a; Neild et al., 2004; Pallapa et al., 2007). While other types of sources addressed personal privacy, few references were found to

background normative theory or theories of privacy. In many sources discussion of privacy, risk and related concepts was very brief, limited to few sentences or paragraphs, although longer discussions were not rare (c.f. (Brey, 2005; Friedewald et al., 2007; Gaul and Ziefle, 2009; Little and Briggs, 2009; Remmers, 2010; Ziefle et al., 2011). Privacy was often seen as a hurdle to be overcome to make systems acceptable to users by protecting their right to control their data (c.f. Zwijsen et al., 2011), rather than as a broad normative concept with context and user-specific norms.

These results reveal two significant gaps in the literature: (1) system and security developers fail to explain their understanding of privacy and related concepts (e.g. security, trust, confidentiality) from a theoretically informed position; and (2) aspects of personal privacy which cannot be addressed through system and security development receive comparatively little attention. This suggests a disconnect exists between theoretical and applied disciplines, in which theoretical development of privacy as a normative concept fails to inform development of PHM systems and underlying security architecture.

Explicit definitions and discussions acknowledging the conceptual complexity of privacy were scarce in security-oriented literature[6], suggesting that systems are being designed and secured under the impression that privacy protections function generically across a variety of contexts. This fails to acknowledge the context-sensitivity of (expectations of) privacy (Nissenbaum, 2004), and risks presenting systems as 'privacy-enhancing' (c.f. Subramaniam et al., 2010) which are merely technically secure: "The idea is tempting: once we solve security, that is, once we are able to achieve authenticity and trusted communications, privacy will be a by-product that follows inevitably from a secure environment…The important aspect to realize is that security might not be the panacea it appears to be, and it might not need to be that panacea either" (Langheinrich, 2001). When privacy is seen as a complex, multi-faceted normative concept inspiring a rich history of normative theory, the simplistic, 'one-size-fits-all' approach to security in PHM appears insufficient.

The narrow conception of privacy, by which privacy is reduced merely to control of data, risks simplifying future discourse, design and governance of PHM by ignoring personal, context-sensitive aspects of privacy. Current discourse risks devaluing experiences of users falling outside of the narrow scope of privacy defined in terms of data. Furthermore, it is problematic to claim that a PHM system or security mechanism is 'privacy-enhancing' (c.f. Garcia-Morchon et al., 2009; Pallapa et al., 2007) without demonstrating awareness of the conceptual complexity of privacy, and underlying theories of privacy. The need to expand the scope of the discourse has been recognised (Caine, 2009), but remains largely unrealised as evidenced by the relatively few sources which provide in-depth discussions of aspects of privacy beyond security or data control.

This feature of current discourse may be a result of application developers lacking expertise in security (Busnel and Giroux, 2010), privacy and ethical theory, while simultaneously failing to acknowledge research in these areas.[7] This is not to suggest that developers need to engage in theorising, especially in reporting on new systems, security measures and frameworks in conference proceedings and academic journals. Rather, what was lacking from 'applied' discussions in the reviewed literature was *awareness* of the complexity of privacy, security and risk, and the ethical and social scientific works which demonstrate the difficulties associated with 'universal', acontextual conceptions of privacy (c.f. Nissenbaum, 2004). The literature suggests developers understand privacy one-dimensionally: privacy is control over data about oneself, and is guaranteed through security mechanisms. If this simplified conception becomes embedded in system design, users face a future of 'privacy enhancing' health monitoring systems which may fail to meet their privacy expectations in practice. To mitigate this risk, developers and regulators need to better explicate their conception of privacy and its theoretical foundations, and identify how it is translated into system design. Furthermore, achieving a context-sensitive understanding of privacy requires understanding attitudes and expectations of stakeholders (McLean, 2011), as well as practice-internal norms

[6] Of the 81 sources reviewed, only 27 explicitly defined privacy or risk.

[7] The limitation of privacy to data control, dissemination and security aspects by developers matches Westin's influential conception of privacy as the right of individuals "to control, edit, manage, and delete information about them[selves] and decide when, how, and to what extent information is communicated to others" (1970).

(MacIntyre, 1984; Nissenbaum, 2004) of information dissemination and fair usage unique to the context(s) in which a particular PHM application will be used. Empirical research (c.f. Gaul and Ziefle, 2009; Little and Briggs, 2009; Ziefle et al., 2011) and participatory design methods (c.f. Genus and Coles, 2005; Joss and Bellucci, 2002) which address these needs are readily available, and need to be explicitly utilised by developers.

By failing to address personal privacy in the design of PHM systems and security, the design discourse is ignoring intrusions by third parties into the 'private' lives of users unrelated to data dissemination (see: Section 3.2). Data sharing is at the heart of such disturbances, yet describing the normative character of these violations in purely informational terms misses the disturbing aspect of the intrusion—it is the fact that data is being collected or shared, rather than the content of the data, which is seen as problematic. In other words, PHM systems disturb users through the introduction of third parties into their private spaces and decisions. This aspect of PHM, which can be described in terms of psychological obtrusiveness (c.f. Hensel et al., 2006), has not yet received the attention it deserves in the literature, perhaps because its solution does not lie (only) in 'designing for security'.

The importance of correcting this deficiency in the discourse also lies in the great potential for PHM to violate privacy expectations of users in collecting and handling extremely sensitive personal data. PHM gathers data about health, often within the confines of the home (Rashid et al., 2007). Systems are being implemented to monitor these sensitive domains, yet it is doubtful that users understand the systems' potential, in terms of violations of privacy and data mining (Beaudin et al., 2006). Data can be collected and presented in potentially distressing or revealing formats, connections can be identified between seemingly unrelated pieces of information, and a range of unforeseeable secondary uses of increasingly rich longitudinal data sets are possible. Users may assume that developers and data custodians have 'protected them' from unanticipated consequences through appropriate privacy policies (Rashid et al., 2007), creating a space in which privacy violations can occur beyond the awareness of the user.[8]

5. Conclusion

The results of this review reveal that the current discourse of privacy, risk and PHM is dominated by concerns related to controlling the dissemination of personal information. While in-depth discussions of non-information aspects of privacy do exist, they have failed to impact upon the discourse surrounding system development and security, which generally operate upon a narrow definition of privacy as 'information privacy'. It follows that systems designed to meet myopic interpretations of privacy may fail to meet the privacy expectations of future users of PHM. To improve the discourse, background normative theories of privacy, autonomy and self-determination (c.f. Hoven, 2008; Nissenbaum, 2004; Rossler, 2004), among others, need to applied to improve the development and governance of PHM.

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[8] This situation raises a philosophical question regarding whether a user must 'care about' their privacy for violations of privacy to occur. Unfortunately, addressing this complex topic goes beyond the scope of this review.

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ETHICAL CONCERNS IN USABILITY TESTING INVOLVING OLDER ADULTS

Margrethe H. Møller

Abstract
Based on experience from the research project "User Manuals for Older Adults", this paper discusses whether there are special ethical concerns with older adults as test persons in a usability test involving the think-aloud method. In this context, older adults are defined as individuals with normal cognitive and physical problems of ageing. The paper concludes that usability testing is necessary as a part of the design cycle, but that special care can be taken to ensure that test persons do not feel disempowered during the test.

Keywords
Older adults, user manuals, usability testing, think-aloud method, ethical concerns

1. Introduction

This paper discusses whether there are special ethical concerns with older adults as test persons in a usability test involving the think-aloud method. In this context, older adults are defined as individuals with normal cognitive and physical problems of ageing. The question was triggered by a test person aged 77 stating in a post-test interview that she was not satisfied with her performance: *"I feel like an illiterate. I know I used to be able to do better"*. Had we been putting her under undue pressure and damaging her self-esteem?

The discussion is based on experience from the research project "User manuals for older adults" [1]. Studies show that older adults find it difficult to read the user manuals supplied together with domestic technological products[2]. However, domestic technology and the accompanying manuals should be designed in a way that allows older adults to use them without depending on help from younger relatives. In our project, we investigated whether user manuals written according to "best practice" in technical writing and document design would fulfil the needs of older users, or whether for example additional explanations and feedback would be necessary. This investigation was based on literature studies and usability tests of user manuals with test persons from our target group.

The usability tests took place in 2010 and were designed by my colleague Ellen Christoffersen and myself. We asked 10 test persons aged 55 to 77[3] to participate in a think-aloud test of different versions of a manual for a digital photo frame. During the test, they solved a number of tasks on the digital photo frame with the manual as their only help.

The tests were carried out in a controlled setting at the university by a test moderator and an observer taking notes. The observer was either Ellen Christoffersen or myself. The test moderator in all 10 test sessions was a colleague, Annelise Grinsted, who was neutral, not being a member of the project team. Although she was not an experienced test moderator, her extensive experience from university teaching and management positions involving human relations made her well-suited for the task. To

[1] Danish: "Brugervejledninger for ældre". See e.g. Møller, M. H., Christoffersen, E. (2010) and Møller, M. H., Christoffersen, E., Toft, B. and , B. Norlyk (2012).

[2] One of the latest Danish studies by Wilke Markedsanalyse A/S was cited in Danish newspapers in November and December 2008 (Wilke 2008).

[3] Age-related changes are primarily genetic, but are also caused by external factors such as general living conditions and life style. Therefore, there will be large individual differences in the ageing processes experienced by older adults. The age group of 55+ was primarily chosen because it was used in other, similar projects – and not because specific age-related changes will necessarily occur at that time of life.

supplement the observation notes, sound recordings of the test sessions were carried out with the permission of the participants.

Figure 1: Test setup – the Test Moderator, the Test Person with the digital photo frame and the manual, and the Observer taking notes

Usability testing in the form of think-aloud tests has been applied in software and website development since the early 1980s. In descriptions of the method, ethical considerations are always stressed. For example, Dumas and Fox (2008: 1144 f.) point out the following main areas of concern:

1. Informed consent
2. Confidentiality of data
3. Balancing harm with purpose

When carrying out usability testing with healthy older adults, there are no special ethical concerns regarding 'informed consent' and 'confidentiality of data' – the same guidelines will apply as with younger adults. However, there may be special concerns regarding 'balancing harm with purpose'.

In the initial briefing before a usability test, the test moderator will normally reassure test persons that the product (in our case the manual) is being tested, and not the test person's skills. Nevertheless, it is not uncommon for tests persons to be anxious about the test situation. According to Dumas and Fox (ibid.), the justification for putting test persons under stress "comes from the balancing principle that future users are being saved stress by finding its causes in the test", and test moderators will use their judgement to decide how long to continue with the test if a test person shows signs of stress. Dumas and Fox also note that this ethical dilemma has not been adequately addressed by the usability community.

The present paper will address the following questions: Should older test persons with normal cognitive and physical problems of ageing be seen as more vulnerable than other test persons? Is thinking aloud more difficult for older test persons than for younger ones? If the answer to those questions is yes, will the "greater good" of improving the product (in our case the manual) justify putting older test persons under stress? Or are there alternative, less distressing methods of usability testing one could use to achieve similar results?

2. Previous research regarding usability testing and older adults

The literature on usability testing does not say much about using older adults as test persons. However, some experience has been reported.

In their book "Designing for older adults", Fisk et al. briefly discuss usability testing issues such as statement of goals, sampling and statistical analysis issues and pilot testing (2004: 37 ff.). According to them, most usability testing issues will apply equally to older and younger users, "although older users may in some instances demand a more careful consideration of these issues".

Dumas and Fox (2008: 1143) note that testers should leave plenty of time for each participant and that they should be prepared for their expectations regarding social interaction and courtesy.

Rubin and Chisnell (2008: 295-298) report their experience with older adults as test persons as regards recruitment, pre-test communications and interaction during the test in a way which indicates that the persons they worked with must have been more marked by age than the test persons in our project.

In their article "Methodologies for Involving Older Adults in the Design Process", Newell et al. write briefly about usability testing noting that older users may have very low confidence in their abilities and "thus it is important that experiments are conducted in a supportive environment, where the users are shielded from making major mistakes which could destroy their confidence altogether" (2007: 984).

3. Are healthy older test persons more vulnerable than younger ones?

3.1 Our data

All our 10 test persons were very open-minded and ready to try to understand the tasks and the purpose of the test, and we did our best to make them feel comfortable and to stress the fact that not they were being tested, but the manual, and that they were helping us to find design flaws. However, during the tests, most of them showed signs of frustration.

Our colleague Birgitte Norlyk carried out a thematic communication analysis of the transcribed think-aloud-tests (Norlyk 2012). She found evidence of three main themes:

I. Personal powerlessness
II. The power and authority of technology
III. Self-esteem and guilt

She exemplifies these themes by quotes from the transcriptions, while pointing out that the themes are expressed with varying intensity by the individual test persons.

Theme I: Personal powerlessness

Norlyk notes that this theme is expressed by test persons while interacting with the photo frame and the manual. Most of the test persons express very strong metaphors or expressions of powerlessness, for example victim metaphors, during the test:

- 'Jeg er på herrens mark nu' [I am completely lost now]
- 'I har fundet jer et godt offer' [You have found yourself a good victim]
- 'Jeg er blevet shanghajet… Jeg synes næsten, jeg er helt færdig' [I have been shanghaied… I feel almost worn-out]

Norlyk also notes, however, that some test persons who are more familiar with technology do not express the same degree of personal powerlessness – in fact, they seem irritated. These test persons accept having to proceed by the method of trial and error and do not feel their self-esteem threatened:

- *'Det er noget rod… Der sker ikke en dyt. Jeg HAR jo sagt 'split slide'.*[That is a mess … Nothing happens at all. I DID say 'split slide' already]

Theme II: The power and authority of technology

Norlyk points out that the most frustrated test persons also have great respect for the technology and the manual as absolute authorities. As she puts it, the willingness to submit oneself to the authority without making any demands or putting critical questions characterizes the weak user, who will also demean him- or herself and take the blame for the unsuccessful communication:

- *'Så lykkedes det endelig. Kan man være så dum?'* [Finally, it succeeded. How can one be so stupid?]
- *'Nu sker der ikke mere, vel? Nej, nej, nej!'* [Now nothing more will happen, will there? No, no, no!]
- 'Der står vent venligst… Så er jeg næsten nødt til at vente på et eller andet. Men hvad?' [It says please wait ... Then I am almost obliged to wait for something. But for what?]

As Norlyk puts it, stronger users are less easy to impress:

- *'Man er nødt til at prøve sig frem. Jeg er nysgerrig efter at vide, hvorfor billedet…'* [You have to use the method of trial and error. I am curious to find out why the picture ...]

Theme III: Self-esteem and guilt

As noted by Norlyk, several of the test persons express threatened self-esteem and personal dignity in the interaction with technology and manual, and they use different strategies to cope with this.

Female test persons typically try to create a frame for understanding the situation by assuming guilt and doubting their own value, while internalizing responsibility for not being able to solve the task:

- *'Det er ikke jeres skyld' (henvendt til testlederne)… 'Jeg har ødelagt den.'* [It is not your fault (addressing the test moderator and the observer)... I have ruined it]
- *'Føler mig som analfabet.'* [I feel like an illiterate]
- *'Jeg er ikke god til at tænke selv.'* [I am not good at independent thinking]

Male test persons often externalize responsibility – it is the others' fault:

- *'Manualen er dårligt skrevet.. Totalt volapyk'… 'Det kan jeg sgu ikke finde ud af… her ville jeg have smidt det fra mig.'* [The manual is badly written ... Total gibberish ... I can't make any sense of it at all ... normally I would have thrown it aside by now]
- *'Hvis jeg brugte apparatet regelmæssigt, ville jeg kunne lære det ret hurtigt.'* [If I would use this appliance on a regular basis, I would be able to learn it rather quickly]
- 'Hvis jeg havde det rigtige værktøj'. [If I had the right tool.]

3.2 Discussion

In general, older adults would probably resent being stigmatised as old and vulnerable (Göbel and Yoo 2005). But it is clear from Norlyk's communication analysis that during the tests, test persons experienced varying degrees of frustration, which did threaten their self-esteem and personal dignity.

In our project, we did not test the user manuals with younger test persons, so the following discussion will be based on comparisons of our observations with general experience from usability testing as reported in the literature.

Reactions of test persons in usability testing

As Dumas and Loring (2008) put it, "usability testing is meant to uncover design flaws – places where the product interface doesn't match users' abilities, experiences, or expectations." You want users to find any design flaws, and in that process, they will have to struggle.

Steve Krug notes that "it is not unusual for the [test] participant to experience a wide range of feelings while doing the task", and he mentions optimism, thought, puzzlement/confusion, frustration/anger, and resignation/blame (Krug 2010: 77).

Dumas and Loring (2008) note that test persons who are less experienced with the product tested, i.e. novice users, will assume that it is their lack of knowledge or expertise that is causing them to fail. They might make statements to defend themselves or to blame themselves. Expert users, on the other hand, will more often understand that the interface is poorly designed and are less likely to blame themselves.

These general descriptions tell us that the reactions we observed in our older test persons will be found in younger test persons as well.

The difficulty of thinking aloud

The usability tests in our project were rather demanding. The test persons had to divide their attention between:

1. following a step-by-step instruction in the manual, and

2. finding the right buttons at the back of the digital photo frame (by feeling their way or by turning the photo frame, and perhaps having to look up the names and positions of the buttons on a different page in the manual), and
3. observing the outcome on the screen at the front of the photo frame, and
4. thinking aloud, because this was a usability test

This was difficult for most of our older test persons, as it would probably have been also for younger test persons. Only a few were able to solve all the tasks, and they became silent as the tasks became more difficult, which is a well-known phenomenon in think-aloud testing. Those who managed all or almost all tasks successfully, were extremely disciplined in following the step-by-step instructions of the user manual, or they used the manual as little as possible, relying on their intuition and knowledge of technical products to operate the photo frame.

One test person, who had great difficulties, used the strategy of repeating the instructions of the user manuals to himself, probably in order to keep focus.

According to the literature on ageing, cognitive abilities decline with normal ageing. This decline is most marked in the working memory. The result is reduced speed and ability at problem solving, as the ability to disregard unimportant signals decreases. (Stuart-Hamilton 2006). Thus, thinking aloud while solving problems must be more difficult for older than for younger test persons.

Fisk et al. state that the "dual-task" situation of operating a product and thinking aloud simultaneously (in our tests of user manuals, it was a "trial-task" situation) may cause the older test person to perform less skilfully than if they had not had to think aloud. They suggest that the test person could be asked to perform each task twice, thinking aloud only the second time (2004: 38).

The role of the test moderator – types of interventions

When considering the ethics of the test situation, it is relevant to consider how it is handled by the test moderator.

According to the literature on think-aloud testing, test moderators should keep neutral and refrain from helping the test person, unless he or she is completely stuck, in order not to influence the test result (Dumas and Loring 2008, Rubin and Chisnell 2008: 209; Molich 2003).

The Danish sources on which we based our think-aloud tests (Molich 2003; Gregersen and Wisler-Poulsen 2009), do not in great detail treat ways to handle critical situations when test persons become frustrated. Other sources, however, are more explicit describing under which circumstances and how test moderators should intervene (e.g., Dumas and Loring 2008; Rubin and Chisnell 2008).

Dumas and Loring (2008) distinguish interventions which simply encourage users to proceed or to think aloud and interventions which may help the user complete a step (so-called assists). Providing assistance may compromise the validity of the test, but on the other hand may help move past one step so that later problems may be discovered.

According to them, the following interventions are not to be considered assists (the article gives examples of phrasings which can be used):

- Prompting test persons to think aloud, or probing, i.e. asking participants for additional information or clarification
- Providing encouragement
- Clarifying tasks, when test persons begin performing a different task than was intended
- Helping test persons to recover from a bug
- Redirecting test persons when they choose a correct but unanticipated path

The following types of interventions are considered assists. The levels move from general to specific, and reflect giving the test person an increasing amount of information:

- Level 1: Breaking a repeating sequence
- Level 2: Providing a general hint
- Level 3: Providing a specific hint

- Level 4: Telling participants how to do the next step

Our test moderator used all of the above types of inventions which are, according to Dumas and Loring, known from general user tests. In addition, she felt it necessary to do the following:

- Rephrasing a task before the participant began solving it, anticipating that the participant would otherwise not understand the task
- Skipping a task, assuming it would be too difficult or too distressing, and moving on to the next task

Dumas and Loring also specifically note which signs of frustration to look for in test persons and how to react to them. These are mainly nonverbal cues, such as the test person looking intensely at the product and nowhere else, showing obvious anger or tunnel vision – an inflexibility in exploring options and repeating the same things over and over. These cues may tell the test moderator that the test person's emotions have become too intense.

The recommendation in such situations is to tell test persons that they are providing valuable information and remind them that they are helping future users. (Dumas and Loring 2008; Rubin and Chisnell 2008: 212 f.). If that does not alleviate the situation, it may be advisable to ask the participant if he or she wants to stop the session, and proceed to the post-test interview (Dumas and Loring 2008).

Our test moderator stopped 5 of the 10 test before all tasks had been presented to the test person, either because one hour had elapsed or because the test person showed signs of fatigue.

Summing up, our test moderator's interaction with the older test persons was within the boundaries of what seems to be considered normal in the general usability testing literature.

4. Alternative methods?

User tests are evaluation activities which can be part of a design cycle involving the steps "establishing requirements", "designing alternatives", "prototyping" and "evaluating", see Figure 2 from Rogers et al. (2011) below.

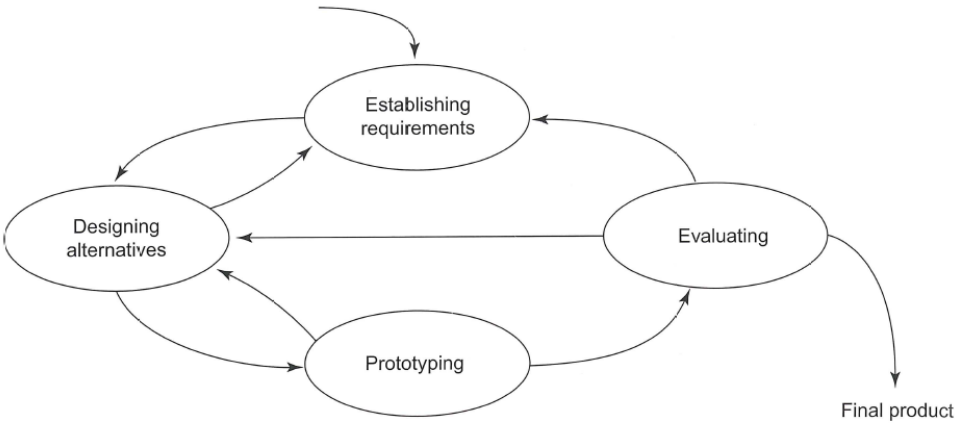

Figure 2: A simple interaction design lifecycle model Rogers et al. (2011: 332)

Usability tests can be formative or summative (Dumas and Fox 2008: 1134). In both cases, test persons should be users from the target group(s) of the product, as they will typically use the product in ways that designers did not foresee.

Similarly, in our case, we did expect that users would not be able to use the original user manual for the photo frame (in fact, the 77 year old test person mentioned at the beginning of this paper worked with the original manual). But we had hoped they would be able to use our test manuals, which we had attempted to design according to best practice in technical writing/document design/the ageing

literature, based on checklists and guidelines, and edited over and over again. Nevertheless, usability tests did reveal design flaws in the manuals, and showed us that users did not use them as we expected (Møller 2013).

There are other methods of involving users in the design process or design cycle – particularly in the creative parts of the design cycle, i.e. the "establishing requirements" and "designing alternatives" activities in Fig. 2. Newell et al. (2007) give a good overview of User Centred Design (UCD) methods in relation to older users.

However, regardless of the methods used in the creative parts of the design cycle, there will inevitably be design flaws, which will only be revealed in practical use, where they will affect many people, or in usability tests, where they will affect only a few.

5. Conclusion and recommendations

Usability tests are necessary as a part of the design cycle, and when older adults belong to the target group, they should be included as test persons.

Healthy older adults are not generally to be considered vulnerable, but participating in a usability test is potentially harder for them than for younger ones. This is due to reduced short-time memory which makes it harder to solve problems while thinking aloud, and in some cases also due to lack of knowledge of the type of product being tested.

User tests should be planned so that they do not harm the test persons. Although the purpose of the test is to find design flaws, test persons, young and old, tend to blame themselves for any problems. Especially in the case of older adults, user tests may highlight any age-related deficits, as experienced by the 77 year-old test person mentioned in the introduction to this paper.

Therefore, in planning tests with older test persons, the following recommendations should be considered:

- Letting experienced users test the product (or in our case the user manual) first in order to remove obvious design flaws. As Fisk et al. note in connection with usability testing of products: "if people very familiar with the basic product are having difficulty, it is unreasonable to expect novice older users to have much success" (2004: 41).
- Making sure that test persons understand the purpose of the test – finding design flaws – from the beginning, and reminding them of it during the test.
- Planning the types of interventions carefully, including possible phrasings to be used in different situations. Dumas and Loring (2008) have good suggestions.
- Letting older test persons solve every usability task twice, only thinking aloud the second time, cf. Fisk et al. (op. cit.), although to my knowledge, there are no reports of this approach having been tested in practice.

The overall aim would be to create an atmosphere where the test person, although she may have to struggle, feels empowered as a representative of a large group of future users who will be saved a lot of frustration.

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FUTURE TECHNOLOGIES: AN ETHICAL PERSPECTIVE ON THE DRIVE FOR INNOVATION AND THE INTERNET OF THINGS

Denise Oram

Extended Abstract

The Internet of Things (IoT) is a new paradigm where connected devices create new global service opportunities based on real time physical world data. It has capabilities to facilitate communication and collaboration with everything to anything, anywhere; however, the impact and consequences of these new devices and services are not being considered from an ethical perspective to any great depth, if at all. The paper focuses on the Internet of Things (IoT); the next major revolution in technology since the World Wide Web.

The continual growth and development of new technologies without direct knowledge of future implications they might have on people, society, and the environment, is of increasing concern. Consideration should be given to creating awareness if we are to ensure the possibilities of ethical ICT especially in a society where we are dependent upon a technological infrastructure. Standards of professional competence, conduct and ethical practice should be maintained with regard to the development of these technologies to ensure the future well being for society.

We have, over the past two decades seen the exciting, rapid and exponential growth of the Internet and World Wide Web (www) that has created major changes to our lives and society as a whole. The impact of these new technologies has been astronomical, we have experienced major changes in the infrastructures in society; they have improved our lives in many ways, in forms of speed and geographical space in communication. We have already experienced the many benefits of this new world environment, however, we have also been faced with its many challenges and unpredicted outcomes that were not previously anticipated by its creator. With the development of new technologies, such as the IoT, we will undoubtedly be faced with many new ethical dilemmas.

The IoT has been identified as one of the "Six Technologies with Potential Impacts on US Interests Out to 2025, in a report by the Intelligence Council in the US on Disruptive Civil Technologies. The report states that Nations will be challenged by the IoT as a result of changing demographic structures and new psychologies "to the extent that everyday objects become information security risks, the IoT could distribute those risks far more widely than the Internet has to date". The report also highlights the fact that it could be manufacturers who could be vectors for delivering malicious software in everyday objects. We are already faced with cyber attacks and security issues and we might be faced with further problems in the future with the development of the IoT, and should therefore create awareness of any potential negative outcomes. (National Intelligence Council, 2008).

The central problem we face is the lack of ethical consideration at the conception of these technologies and the issues tend to emerge after their implementation. Lugenbiehl states that "An important aspect of the study of ethics is being able to recognize ethical issues in the first place … Political , historical, and cultural factors, among others, need to be taken into account in developing a judgment about complex ethical situations …. responsibility for public safety, health, and welfare is not only an aspect of engineering codes of ethics, it is the core ethical responsibility of engineers … safety and reliability were put at risk, they were traded for economic efficiencies". (Luegenbiehl, 2007). Early recognition of ethical and related issues can save time and money, support user acceptance and promote beneficial aspects of the technology.

Legitimate developers may be well-meaning in their attempts to adhere to ethical guidelines during the process of creating IoT products and services, but it is not always clear where that guidance is available, and how to interpret it. Professional IT organisations can, and do try to adopt a common ethical stance through the definition of Codes of Conduct. We may reasonably assume that the adoption of these professional codes provides the computing professionals with the necessary skills

and ability to resolve ethical conflicts, but are unsure as to what extent they are sufficiently effective mechanisms.

As technologies are being deployed without a deep understanding of the social repercussions of their deployment, it is becoming increasingly important to develop new standards and to educate the practitioners in their responsibilities with regard to the ethical and social considerations of their work. With the development of the IoT, there will undoubtedly be new security and safety issues as well as issues with management, provisioning resources and scalability of limitless numbers of objects present in any scenario. With object-object, object-human and object-Internet, there will be vast amounts of data generated in real time services and distributed over the networks with no deep understanding of the possible detrimental outcomes.

Evaluating the performance of these networks is a major challenge, with issues of routing metrics, end to end delay and reliability, energy consumption, and router congestions. Many new issues and concerns will also arise with protecting the privacy of personal information and possible lack of control with human-machine symbiosis.

The paper is a discussion of the social implications, examples, issues and considerations that the IoT presents for the global society and makes recommendations for how developers might prepare for the ethical challenges of IoT. It is fundamentally of a conceptual nature and meant to provide the grounding necessary to develop empirical work.

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E-GOVERNANCE RISK IN JAPAN: EXACERBATION OF DISCRIMINATIVE STRUCTURE BUILT IN THE FAMILY REGISTRATION SYSTEM

Yohko Orito, Kiyoshi Murata and Chung Ah Young

Abstract
This study attempts to examine social risks caused by the introduction of a new e-governance system in Japan centred on a national code-number resident identification system called the My Number System, focusing on architectural characteristics and discriminatory structures embedded in it. The operation of the e-governance system could bring the unignorable social risks, even though the architecture of the My Number System is designed in consideration of personal data and privacy protection. In addition, this study analyses the social risks from the perspectives of non-Japanese residents in Japan as well.

Keywords
e-governance, the My Number System, family and resident registration, discrimination

1. Introduction

The development of e-governance has been a critical issue for many advanced nations. It is expected to contribute to make government activities more efficient and raise the level of government services provided to citizens. In a recent 2-year period, Japan's development of e-governance has reached a crossroads. The Democratic Party of Japan (DPJ) administration decided to deliberate a bill to create an integrated national code-number resident identification system across the office and ministries called the My Number System, which assigned a unique personal ID to each of Japanese citizens, special permanent residents including resident Koreans and long-term foreign residents, and introduced the bill (the My Number Bill) to the Diet in February 2012. Such a resident numbering system allows the government to integrate wide range of personal information of residents in Japan.

Nevertheless, Japanese legal schemes for protecting personal information are less effective (Orito and Murata, 2005; 2007). Although the My Number Bill contains the first significant change to the Japan's information privacy law in a decade, it is unlikely to cause any significant improvement to the overall protection of information privacy in Japan (Greenleaf et al., 2012). A lot of issues concerning personal information protection will remain unsettled, even if the My Number System and related laws are implemented. Moreover, whereas an incomplete data double of a person which is constructed based on personal information of him/her as a set of "dividuals" (Deleuze, 1992) stored in government databases can lead to insufficient governmental services to him/her, governments' having a capacity to create (nearly) complete data double of their residents through thoroughgoing data matching may cause non-negligible social risks.

In Japan, different kinds of family registration systems have been developed and operated for, for example, taxation and public service provision by central and/or local governments since the end of the 7th century. In most cases, personal data of citizens including names, addresses, family lineage and blood relationships were/are recorded in their family registers. The governmental bodies have utilised the systems as a tool to govern citizens' lives, and, consequently, the family registration systems have had a considerable influence over Japanese and non-Japanese residents' personal as well as social lives. The problem is that even the current family registration system still has discriminatory characteristics derived from the Japanese traditional *Yi-e* (family) system where each family was required to carry out a specific duty allotted to them (Bitoh, 2006) and these characteristics would be embedded into the My Number System in an invisible fashion.

This study attempts to analyse social risks which would be caused by the introduction of a new e-governance system centred on the My Number System in Japan with a focus on a discriminatory structure incorporated in the architecture of the resident numbering system. Whereas a personal information protection scheme to be built in the My Number System has been well discussed among policy makers, the discriminatory nature it would have has scarcely been mentioned. This study examines the social risks from the perspectives not only of Japanese citizens but also of non-Japanese residents in Japan.

The structure of the remainder of this paper is as follows. The next section examines Japanese legal schemes for personal information and privacy protection and its less effectiveness, followed by the section where the short history of the citizen numbering system in Japan is described and characteristics of the My Number System and its architectural risks are examined. In Section 4, the discriminatory structure built in the traditional Japanese family registration systems is explained and their inheritance to the e-governance system is discussed. In the final section, social risks to foreign residents in Japan caused by the introduction of the e-governance system are analysed.

2. Japanese legal schemes for protecting personal information and privacy

The Japanese legislation for protecting personal information doesn't have a long history. Until 1988, there were no legal regulations for personal information protection in Japan. The first law, the Act on the Protection of Personal Information Held by Administrative Organs and Processed on Electronic Computers (Act No. 95 of 1988), was put into force in 1989. This act covered just the public sector, and personal information protection in the private sector was addressed on a self-regulatory basis. However, the publication of OECD's (1980) eight principles and the Directive 95/46/EC (European Parliament and the Council of the European Union, 1995) made the Japanese government recognise the necessity to enact comprehensive legislation for personal information protection in response to the external pressures. Consequently, the Act on Protection of Personal Information (APPI; Act No. 57 of 2003) was enforced in April 2005. APPI is the first law for protection of personal information held by both the public and private sectors in Japan. The enforcement of APPI was also considered to be a prerequisite for developing and operating the Juki Net System, which was the Japanese online national resident registry network implemented in 2003.

However, it is repeatedly pointed out that the Japanese legal schemes for protecting personal information and information privacy is less effective compared to other countries' legal regulations. APPI was created so that personally identifiable information (PII) collected, stored and used by public and private organisations was protected, and the makers of the law deliberately precluded the elements of privacy protection beyond PII protection on the ground that the concept of privacy was elusive. Any law for setting up independent panel to monitor and control personal information handling in public and private organisations and for creating the position of a privacy commissioner have not been enacted, although the necessity of these have widely been recognised. APPI contains penal provisions (Articles 56 and 57), but these provisions have not yet been applied to any entity handling personal information since the Act took legal effect. The procedure for applying the provisions is quite cautious and it seems that the law makers as well as the Japanese government hesitate to impose a punishment on the public or private organisations that violate APPI. In fact, the provisions are applied to an entity handling personal information which violates APPI only after it disobey competent minister's recommendation that the entity should cease the violation and/or take necessary measures to correct the violation.

Additionally, APPI has no provision authorizing compensation to victims of personal information misuse or leakage or improper rejection of right-to-know request for damages they suffer. In order to receive compensation for the damages, the victims have to file civil lawsuits. However, when the time and costs of a lawsuit is considered relative to the amount of compensation typically awarded, they may have little incentive to litigate (Orito and Murata, 2008). Itakura (2012) insists that it is vague whether APPI can serve as the basis for filing a damage suit against those organisations which misuse personal information, because the statements of APPI do not provide any clear description about

rights and interests an information subject possesses, and APPI cannot play a constructive role to provide normative guideline for proper handling of personal information.

Over seven years have passed since the enforcement of APPI, and although the revision of the law has been argued among lawmakers and professionals many times, it has not yet been realised. Rather, it seems that there are no clear understanding of the contents of APPI and its related laws and no strong request for revision of APPI among Japanese ordinary citizens. As a result, the Japanese personal information and privacy protection schemes centred on APPI respond not to recent arguments about personal information and privacy protection but to the Directive 95/46/EC and are way behind the present situation where personal information is often collected and shared in underhanded way and people have lost their capacity for determining the location of as well as for controlling the circulation of their personal information. Despite that fact, a new national code-number resident identification system, the My Number System, is close to be introduced.

3. The My Number System

3.1 Unsuccessful attempts to develop citizen numbering systems in Japan

In Japan, the first governmental attempt at developing a citizen numbering system was made in the late 1960s. The Sato cabinet sought the introduction of a national identification number system in 1968, but this attempt faltered in the face of a strong social concern about the resultant controlled society. In 1979, the development of a taxpayer identification number system was proposed by the Government Tax Commission in order to realise a fair tax system through specifying the exact amount of income of each individual taxpayer. However, the introduction of that citizen numbering system was shelved due to a strong backlash against the operation of the system and the resultant controlled society (Iwata, 2005).

In the next year, the commission recommended the introduction of the tax-free small-sum savings system along with the development and operation of the Green Card System which issued an individually numbered card (a Green Card) to those who were eligible to have small-sum, non-taxable savings (e.g. the disabled and survivor pension recipients). Despite the Green Card System was legislated in that year, this legislation raised a social concern that this system would drive up a tax burden on the rich and, thus, lead to the continued drain of cash from Japan to foreign countries. Consequently, the introduction of Green Card System was suspended and finally abolished in 1985 (Yagi, 2012, pp. 21-22.).

Another controversial citizen numbering system, the Juki Net System, went into full-scale operation in August 2003. The system allows the central and local governments to share personal identification information including an 11-digit resident register code number uniquely assigned to each citizen. Whereas the Juki Net System is expected to raise the level of governmental services provided to the Japanese public, the full operation of this system caused anxiety about personal data leakage and/or misuse and also a vague sense of fear of governmental surveillance in Japanese society. However, based on growing public concern about the unfair burdens of taxes among residents in Japan referred to as the *Ku-Ro-Yon* problem and the reformation the social security system in recent years, the importance of developing a more comprehensive citizen numbering system has been emphasised by the government and bureaucracy officers more than ever before.

3.2 Features of the My Number System

In Japan, the integrated reformation of social security and taxation system is recognised as an urgent political and social issue to address the coming aging society with fewer children and to secure adequate financial resources in Japan. What is considered the most necessary thing to successfully perform the reformation is the development and operation of the My Number System, an integrated national code-number citizen identification system across the office and ministries, which assigns a unique "My Number" to each citizen. The Ministry of Internal Affairs and Communications (MIC)

explains that the operation of the My Number System would be useful for realising a fair tax system, stable and efficient social security programmes, improved administrative services, and efficient and customer-friendly e-governance.

In February 2012, the DPJ and government led by Prime Minister Noda introduced the My Number Bill to the Diet. After the political power shift from the DPJ to the Liberal Democratic Party (LDP) in the Lower House elections in December 2012, the bill was approved as an important matter to discuss at the cabinet meeting held in March 2013. The current Abe administration keeps working to enact the bill aiming for starting to operate the system in January 2016 at the current moment (it remains possible that the name of the Act and system will be changed). The My Number System would be used to enhance governmental service quality in the fields of social security (including pension, unemployment insurance, labour accident, social welfare and health care), taxation and disaster countermeasures.

Figure 1 shows the overview of the My Number System. In this system, a unique personal ID number called My Number is assigned to each eligible resident. He/she is able to access governmental systems and utilise governmental services in the three fields mentioned above using his/her unique My Number. An information system controlled by a competent administrative body has a specific code assigned to him/her which is connected to his/her My Number, and necessary information of him/her stored in the system is retrieved and used to conduct administrative work. The Information Provision Network System has a function to integrate information across governmental bodies using the codes. The My Number System is expected to realise the systematic integration of public administration.

On the other hand, some express doubts about the desired effects of the My Number System and concern over matters including cost-performance of the system, residents' capacity to control access to their personal information, effectiveness for achieving fairness in taxation, and so on (Tokyo kai, 2012; Nakazato and Uenishi, 2012; Tajima et al., 2012). Among others, the potential risks for information leakage and/or an invasion of privacy are emphasised, because the My Number System is basically for integrating resident's personal information using his/her My Number and the system unsurprisingly deals with sensitive information of him/her such as health-care record.

Therefore, the My Number System is designed in consideration of personal information protection. In fact, individuals can access customised portal websites named "My Portal", on which they can confirm their basic information and access logs to the system automatically created and stored by the Information Provision Network System. According to Governmental officers, the My Portal websites permit residents to control the circulation of their personal information. Moreover, the Commission for Protecting a Personal ID Number will be organised, which has a function to monitor the security status of the system as an independent panel. Penalties for law violation in the My Number Act will be more severe than in APPI, although some express their doubt about this (Tajima et al., 2012) .

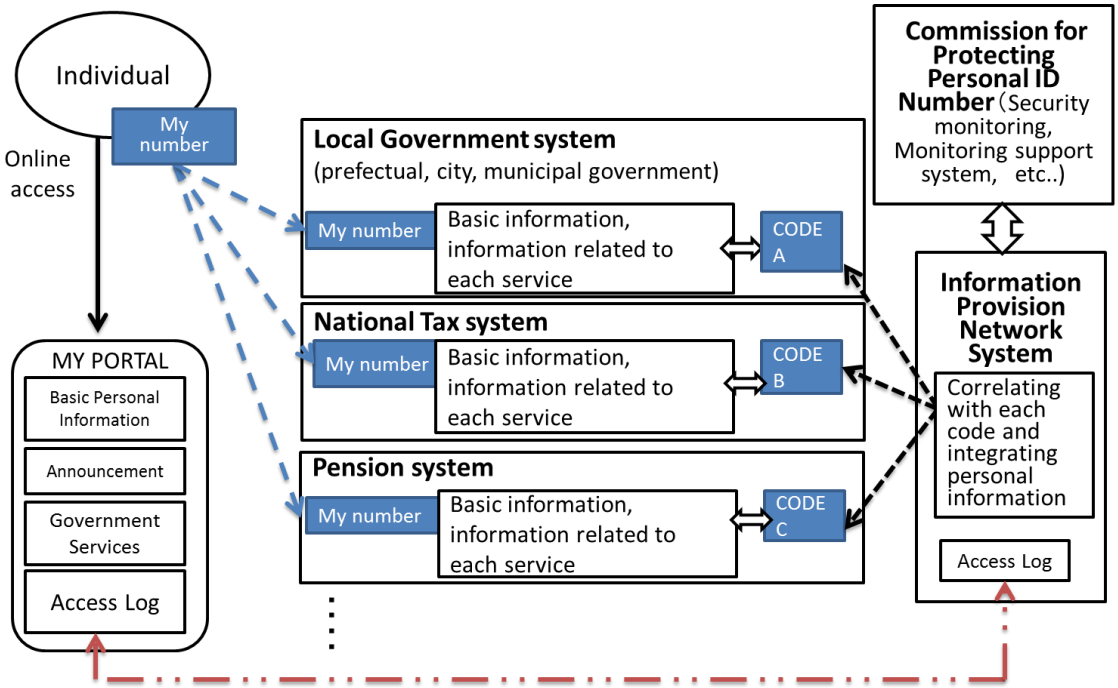

Figure 1. Overview of the My Number System (This figure is created by authors based on Nikkei Computer, 2012, p. 67.)

3.3 Risks caused by dividualisation

As shown in Figure 1, while the Information Provision Network System is designed to integrate residents' personal information stored in different governmental databases, My Number is used at each administrative body for its respective purposes so that My Number and related information are used just to the extent necessary to carry out the purposes of use except when absolutely necessary. This may cause increased developing and operating costs, but the government explains that such system architecture makes it possible to reduce risks of data leakage and inappropriate data matching. For example, when a resident utilise the services of the national taxation system, his/her My Number is used only for the relevant tax procedures without being connected to his/her personal information irrelevant to them. Needless to say, when providing their services, administrative bodies are usually not necessary to use every piece of personal information of residents stored in different government databases. The basic architecture of the My Number System seems not to permit any administrative body to use My Number for personal identification in a comprehensive manner at least on the surface.

The architectural characteristics of the My Number System presume that a resident who receives an administrative service is certain bits of data; supply of administrative services requires service recipients' provision of relevant data, not every piece of their personal information. This situation evokes Deleuze's (1992) notion of the society of control. In this society, he says, codes or passwords regulate the society; individuals become "dividuals", and masses, samples, data, markets, or "banks"; computers play a central role in operation of the society. In fact, the architecture of the My Number System would make a resident a certain collection of fragments of personal information. A context the resident is in and computerised administrative procedures used there determine which fragments represent him/her.

The dividualising feature of the My Number System is seemingly advantageous to protect residents' right to privacy. However, an incomplete data double of a resident created by the dividualisation can lead to insufficient governmental services to him/her and his/her dissatisfaction with the services. This might bring about a situation where residents require administrative authorities to use their personal information in a more complete way. On the other hand, however, governments' having a capacity to create (nearly) complete data double of their residents through thoroughgoing data matching may cause non-negligible social risks. It is very hard for anyone to correctly determine to what extent

resident's data double, which is used for governmental service provision, should be incomplete. However, considering potential function creep or addition made to the My Number System, this should carefully be considered and deliberated. Actually, quite a few people claim that it is meaningless if the system is not utilised in the private sector, and the current Abe administration supports this claim.

4. Japanese family and resident registration systems and their discriminatory characteristics

4.1 My Number System and resident register system

The My Number System has another risk factor which relates to the discriminative nature of the systems of family and resident registration. This entails potential to seriously affect certain residents' social lives. Figure 2 shows the data flow of the My Number System. The Number Creation System operated by the Organisation of Local Government Information System convert the resident register code of a resident into his/her My Number in a certain way. The My Number generated is transferred to the government of the local city/town he/she lives in and they advise him/her of the number. As depicted in Figure 2, My Number is used with resident register information databases operated by local government. Under such situations, the discriminatory characteristics embedded in the resident and family registration systems could be exacerbated with the operation of the My Number System.

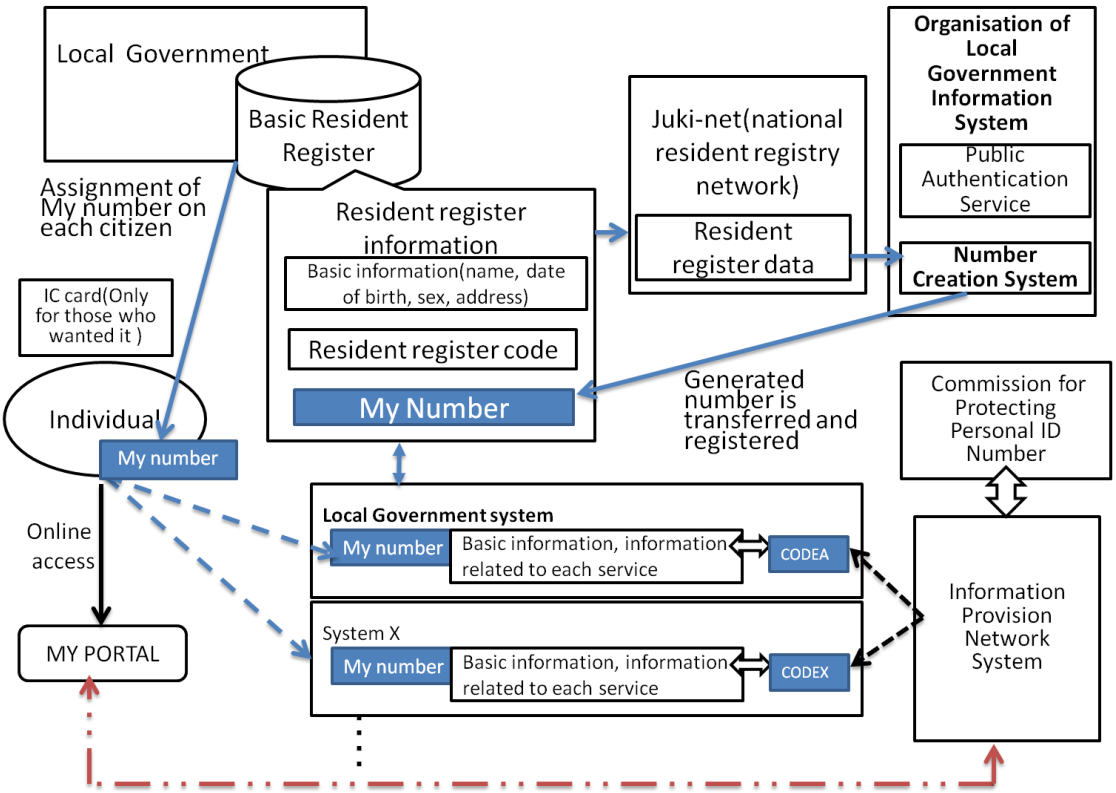

Figure 2. Data flow of My Number System (This figure is created by authors based on Nikkei Computer, 2012, p. 67.)

4.2 Discriminatory characteristics embedded in the family registration system

Since the end of the 7th century, different kinds of family registration systems (*Koseki* in Japanese) have been developed and operated for, for example, taxation and public service provision by central and/or local governments in Japan. In most cases, personal data of citizens including names,

addresses, family lineage and blood relationships were/are recorded in their family registers. However, the social class of each family (imperial, noble, warrior, commoner and so on) was described in the *Jinshin Koseki*, the first family registration system in the modern age, as one of the official registered data fields. The description of this field of some of those families from tribes that had been discriminated against in the Edo era being called *Hinin* (non-human) or *Eta* (much stained people) was ex-*Hinin*, ex-*Eta* or new commoner. This shows that the *Jinshin Koseki* functioned to maintain the people's discriminative mentality towards lower class families/people based on the feudalistic class systems.

After World War II, in conformity to the new Japanese constitution which declared the sovereignty of the people, the social class field was eliminated from the new family register which was drawn up based on the New *Koseki* Act (Act No. 224 of 1947). However, Sato (1991) points out that the true substance of the *Koseki* system is discrimination and exclusion of aliens including foreign residents, naturalised citizens and illegitimates. Based on the belief that citizens cannot be alive without state care, the state declares, through the operation of the *Koseki* system, they are willing to protect Japanese citizens, whose family information is registered in *Koseki*. Those whose data are not stored in the *Koseki* databases are not Japanese citizens, and thus their lives and social opportunities inside Japan are considerably constrained in various ways. The system also promotes unconscious mutual monitoring among family members and relatives. However, these characteristics of the *Koseki* system have not been known well to ordinary Japanese.

In 1952, in order to authenticate citizens' residency and promote the convenience of their everyday lives, each municipal commenced the operation and management of the *Jumin-hyo* (resident card) system. In 1967, the revised resident registration act, the Act of the Basic Resident Registers (Act No. 81 of 1967), went into force. Based on this, family information registered in *Koseki* was connected with residential information in *Jumin-hyo* and the basic resident register databases were built (for more details, see Sato, 1991; Orito and Murata, 2012). Enami (2003) explains the nature of the basic resident register system as follows.

"Basic resident registers are officially a basis for municipals' providing their inhabitants with good administrative services, but some fields of the records of their basic resident register databases are connected with the corresponding fields of Koseki records including date of birth, date of death, marital status and so on. Therefore, the central and local governments can administer Japanese citizens through using the Koseki system, which is used to grasp citizens' nationality and blood relationships as the basis of inheritance, and the basic resident register system, which is used to grasp the state of family units as a subject of administrative services." (p. 6; translated by the authors).

As he suggests, the discriminatory characteristics of the family registration system has been transferred to the Japanese resident registration system. On the other hand, family and residential information stored in the *Koseki* and resident registration systems is considered to be necessary for conducting administrative work on taxation, social security and disaster countermeasures: the intended purposes of the My Number System. Hence, the operation of the system contains the potential risk that the discriminative characteristics built into the family registration system are exacerbated. Furthermore, the advancement of computerisation may obscure the discriminative characteristics and promote their taking root in society. Resident information should be recognised as sensitive one, although Japanese people are not well aware of this due to the myth that Japan is a homogeneous state spread among Japanese people (Oguma, 1995).

It is technologically possible that almost all public services are provided through the operation of a totally integrated system which is constructed centred on the family and resident registration systems. Actually, the My Number System possesses potential for being upgraded towards this kind of system. However, the discriminative characteristics of the family and resident registration systems would be crept in the integrated system, and, therefore, the widespread use of this would cause harmful effects on a wide range of residents in Japan. In particular, the harm should be serious for naturalised citizens, those who marry a foreigner, illegitimate children and adopted children. Those who are not recorded in the family register for some reason (for example, some people eschew the family registration of their children to protect them from domestic violence) are not recognised as a Japanese citizen in a practical sense and, as a result, their social lives and opportunities are considerably constrained as if

they were foreigners. Because of these aspects, some point out that the Japanese *Koseki* or family registration systems function as a tool for social discrimination against and exclusion of aliens (Sato, 1991).

5. My Number System's social risks to foreigners living in Japan

Since the mid-2000s, Japanese immigration control policies and the features of information systems to support them have significantly changed. In 2006, the Ministry of Justice announced their plans to "optimise" the emigration and immigration control system (Information-technology Promotion Committee of Ministry of Justice, 2006). The optimisation plans aimed at enhancing domestic security measures and promoting the efficiency of their implementation, and included the issue of "resident cards" to eligible foreigners living in Japan. An IC chip attached to the card holds information about a card holder including his/her name, address, date of birth and nationality. A unique number is assigned to each card and is printed on the surface of it. The government officer made clear the number would not be used for data matching; the head of the Immigration Bureau explained that a unique number printed on and personal information stored in the card would never be connected with other information (Lower House Judicial Affairs Committee, 2009).

In July 2009, the bills to revise the Immigration Control and Refugee Recognition Act (Cabinet Order No. 319 of 1951) and the Special Act on Immigration Control (Act No. 71 of 1991), which include the proposal of the issue of a resident card in place of the existing alien registration card, were enacted, and the revised acts were put in force in July 2012. Owing to the revisions, in conjunction with the abolishment of the Alien Registration Act (Act No. 125 of 1952) and the revision of the Act on Basic Resident Registers (Act No. 81 of 1967), non-Japanese residents became to appear on the Residents Master Register.

Whereas some governmental officers told that non-Japanese residents would be provided quality governmental services thanks to these revised acts, some critics said that the revisions were a ploy to establish a new non-Japanese resident control system through integrating non-Japanese residents into the My Number System. In fact, resident registers and their code numbers are now issued to non-Japanese residents and the code numbers would be converted into corresponding My Number.

Responding to the revisions, the integrated data management system was set up as a data centre of the optimised emigration and immigration control system. This data centre was developed through the integration of information systems for immigration control, residence investigation, forced displacement and issue of resident cards, for which respective servers had been operated. Moreover, the knowledge management system for immigration officers and their support staff implemented in 2009 was connected to the integrated system, which allowed immigration officers having access authority to access almost all kinds of data about each non-Japanese resident beyond their job duties.

The emigration and immigration control system is now being operated in conjunction with the Residents Master Register for foreigners in such a manner that the Basic Resident Register System bends the knee to the entrance administration. This conjunction allows immigration officers to surveil foreigners' everyday lives and examine their eligibility for living in Japan.

6. Conclusions

In the current ICT society, people are hard to be removed from the effects of technical decisions. Technology use is usually a double-edged sword. The development of e-governance system centred on the My Number System in Japan is no exception. The discriminative characteristics of the family and resident registration systems would be crept in the Japanese e-governance system, and, therefore, the widespread use of it would cause harmful effects on a wide range of residents in Japan. In particular, the harm should be serious for naturalised citizens, those who marry a foreigner, illegitimate children, adopted children and non-Japanese residents.

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SURVEILLANCE-BASED MIGRATION CONTROL AND A SUBSTANTIAL FREEDOM OF MOVEMENT

Elin Palm

Abstract

This paper deals with an increasing securitization and criminalization of migration in Europe. It is shown that EU member states employ surveillance regimes to control movements across borders and to restrict migrants´ access to their territories. The ethical acceptability of such practices are questioned with a particular focus on the "freedom of movement". A more extensive right to freedom of movement is advocated based on the existing right to domestic mobility in Articles 13 and 14 of the UN Declaration of Human Rights (UNHDR). Ideally, individuals should enjoy a right to immigrate as well as to emigrate.

Keywords

Ethics, Freedom of Movement, Migration, Mobility, Human Rights, Surveillance-based migration control, Right to Mobility.

1. Introduction

Migration is a typical adaptive response to altered political unrest and/or absolute or relative deprivation and large number of individuals from the underpriveliged parts of the world seek to enter the stable and affluent European Union in order to improve their job chances. Would they move domestically for the same reasons, their attempts would be supported by the 1948 United Nations´ Declaration of Human Rights (UNDHR). Following UNDHR, all individuals are entitled to "*free choice of employment, to just and favourable conditions of work"* (Article, 23). This right become individuals as citizens within their home countries. In addition, individuals enjoy a legally codified right to leave heir home country in order to seek asylum in another country. The protection of these rights however, is significantly weakened under the current EU migration regime.

Members of countries where authorities fail to protect their right to just and favourable conditions of work, are generally not granted entry to other countries for this reason. North Africans´ chances of improving their work conditions by, in a regular fashion, moving to Europe are rather low. As a general trend, in Europe, migration is increasingly treated as a security issue (Huysmans, 2006) and a criminal offense (Bigo, 2003, Aas Franko, 2007, Pinyol-Jiménez, 2012). During the past decade, the European Union has reinforced external border protection and initiated an externalization of immigration control, strengthening the border control between Africa and Europe in particular (Withol de Wenden, 2006, 2012). Sophisticated surveillance systems are employed to continuously monitor the borders (Broeders, 2006, Dijstelbloem, 2009, Palm, 2009, Dijstelbloem and Meijer, 2012). Protective measures are not only adopted to prevent irregular migrants from entering countries at the external borders of the Schengen region but to hinder those who have arrived irregularly from filing asylum claims e.g. by placing them in detention centres until expulsion (Andrijasevic, 2010). Even the number of refugees admitted by EU member countries is declining.

Intensified surveillance-based EU border-control and a restrictive migration-management, necessitates a discussion of the meaning and value of the fundamental human *right to mobility.* In this paper, the relevance of admitting a right to move domestically but not internationally is questioned. The case is made that a right to immigrate ought to be developed and recognized on par with the existing right to domestic mobility. In section (2), surveillance regimes governing migration flow are presented. In section (3) such measures are critically discussed and the case is made that the human right to mobility should contain a right to immigrate as well as to emigrate. Section (4) concludes.

2. Surveillance-based migration management within the European Union

In recent years, novel agencies governing EU migration control have been established such as the pan-European border surveillance system - Eurosur - operated by FRONTEX[1] concerting (border) protection strategies and activities. Ambitions behind Eurosur are to: (1) combat cross-border crime such as drug- and human trafficking, (2) reduce the number of undocumented migrants entering the region undetected and (3) minimize the number of casualties among migrants trying to enter Europe in an irregular fashion. The Eurosur system is designed to improve the "monitoring, detection, identification, tracking, prevention and interception of illegal border crossings". Sophisticated surveillance regimes have been employed to police external and internal borders (Dijstelbloem, 2009, Dijstelbloem and Meijer, 2011). Automated surveillance and authentication systems (Palm, 2011) and networking of large-scale databases (SIS, EURODAC, VISA) (Broeders, 2007) serve to restrict entrance to Schengen territory. Recently - "Sea Horse" - a satellite system was implemented to track the movements of migrant vessels along the West African Coast and at the Mediterranean sea in order to curtail irregular migration (Ceriani Cernadas, 2009). Parallell with a reinforcement of border-control mechanisms, EU has initiated an externalization of asylum processes as well as of such control. The externalization process includes, among other things, readmission agreements with African countries and Regional Protection Programmes aiming to involve third countries in the processing of asylum applications. Such programmes suggest that asylum seekers should file their applications in so called Regional Protection Areas outside the EU before proceeding to Europe (Noll, 2003, Gammeltoft-Hansen, 2006). A key ambition behind such attempts has been to "avert mass influx of migrants to European territory" (Peral, 2005).

Concerted protection strategies and an externalization of the asylum process raise several legal and ethical problems. Unless root problems are properly addressed, individuals will continue to flee war, persecution and poverty in order to obtain better living conditions. Certainly, systems like the "Sea Horse" may serve to protect – even save lives – if effectively detecting migrants in distress at sea. However, the Eurosur ambition to minimize the number of lives lost at sea can also backfire. Whereas strict border controls may deter some individuals from trying to enter the Schengen area irregularly (possibly including persons with valid asylum claims), others will embark on yet more ardenous and risky journeys in order to reach Europe without being detected by drones, satellite- and radar systems. Surveillance-based border control may for instance force migrants facing an unbearable situation in their home countries to undertake yet more extensive sea journeys on open water (Hernandes-Carretero, 2009). How then do the invasive measures employed by the European Union to control regular- and avert irregular migration affect fundamental human rights?

Following the Dublin Convention, the country in which an asylum seeker first appears (regularly or irregularly) is responsible for processing her asylum claim (Noll, 2003). Although this law was intended to strengthen the fundamental human right to seek asylum, the ambition has backfired. EU member states bordering the Mediterranean are subject to a larger influx of migrants than, for instance, the Nordic member states. In order to reduce the number of potential asylum seekers for whom the countries will be legally responsible, member states like Greece and Italy have intensified their border control activities. Currently, Greece is reinforcing its border towards Turkey by building walls, by radar systems and by FRONTEX patrols. In Italy, irregular migrants who have managed to enter the country are routinely detained until retrieved – often before they have had the chance to file asylum applications (Andrijasevic, 2010).

Obviously, such measures infringe on the human right to seek asylum. More precisely put, the fundamental human right to *leave* one´s country in order to seek asylum in another country is circumvented by (1) EU´s control mechanisms such as FRONTEX´ third-country water patrols and (2) Regional Protection Areas as planned by EU (Noll, 2003, Gammeltoft Hansen, 2006, Ceriani Cernadas, 2009). Once vessels carrying migrants are detected, these are typically diverted by

[1] The European Agency for the Management of Operational Cooperation at the External Borders of the Member States of the European Union. http://www.frontex.europa.eu/eurosur

FRONTEX agents to their (assumed) country of origin. That is, migrants on board are escorted back without an individualized procedure allowing them to apply for asylum. In effect, many irregular migrants are diverted and prevented from seeking asylum in Europe (Hernandes-Carretero, 2009). Denying asylum-seekers access to an asylum process may constitute a breach of the *non-refoulement* principle (Hernandez-Carretero, 2009, Ceriani Cernadas, 2009). Such procedures also obstruct individuals´ chances of *leaving* a country where their fundamental rights and liberties are disrespected in order to seek asylum or admission elsewhere. Similar to pre-border patrols, ambitions to externalize the asylum-seeking process may prevent individuals from exercising the right to leave – at least in a substantial meaning of leaving. Asylum seekers may be required to file their applications in a designated area (e.g. neighbor country) and will only be allowed to travel further to Europe after an approval.

In short, the increasingly restrictive European migration-regime systems imply that non-members chances of entering the region in a regular fashion are restricted. Surveillance-based border and pre-border controls circumvent migrants´ chances of entering the region in a non-authorized way. While capital, goods and skilled workers circulate rather freely within and across the European Union, unskilled migrants do not, at least not in a legal fashion. Thus, *"mobility is a privilege that is unevenly distributed among human beings"* (Pécoud and de Guchteneire, 2006). In light of tis development, what role does the "leaving component" of a freedom of movement play? In the next section, a more extensive freedom of movement is suggested.

3. The case for a substantial human right to freedom of movement

Codified in the UN declaration of universal Human Rights is a right to mobility. Under this right, two types of mobility sort. Article 13 of UNHDR admits individuals to move freely within their own country e.g. settling where ever they wish. Conversely, citizens should not be subject to forced movement or settlement within their country. Article 13 also states that individuals are free to leave their country. Thus, citizens cannot be forced to stay in their country against their interest. Moreover, they are entitled to return after having been abroad. Authorities cannot refuse their own citizens access upon return. "*Everyone has the right to freedom of movement and residence within the borders of each State. Everyone has the right to leave any country, including his own, and to return to his country".* Article 14 (1) demonstrates that *"everyone has the right to seek and to enjoy in other countries asylum from persecution."*[2] They are also entitled to fair and effective asylum procedures.

However, even if all human beings are entitled to emigrate, there is no corresponding right to immigrate. Nation states must, as we have seen, grant individuals the right to seek asylum i.e. to file their asylum applications and having their claims processed in a fair manner but they are not obligated to admit entry unless those seeking access can demonstrate to the authorities in the country where they seek asylum, that they are subject to (political) persecution in their home countries and under life threat would they be retrieved. Importantly, they should be persecuted for political reasons (rather than for reasons of e.g. their sexual orientation) in order to qualify as refugees. Currently, few asylum seekers are granted protection as "refugees", rather, the majority is awarded asylum for reasons of more general protection needs. In short, even if all individuals enjoy the right to move within, leave and retun to their own country, there is no corresponding right to access to and to settle within another country. Rather, the right to migrate is asymmetric (Withol de Wenden, 2000, Cole, 2000).

Absent a corresponding right to immigrate, scholars have deemed the right to migrate pointless (cf. Withol de Wenden, 2000, Pécoud and de Guchteneire, 2006). If no country must accommodate an indivdual´s request to immigrate, where can she go? (Withol de Wenden, 2000). In order to be meaningful, the right to migrate must be accompanied with a right to immigrate (Pécoud and de Guchteneire, 2006). It has also been stressed that individuals´ interests in mobility transgress national

[2] Article 14(2) of the Universal Declaration of Human Rights provides that the right to seek and to enjoy asylum, as guaranteed in article 14(1), "may not be invoked in the case of prosecution genuinely arising from non-political crimes or from acts contrary to the purposes and principles of the United Nations".

borders. ”*Every reason why one might want to move within a state may also be a reason for moving between states. One might want a job; one might fall in love with someone from another country; one might belong to a religion that has few adherents in one's native state and many in another; one might wish to pursue cultural opportunities that are only available in another land. If our freedom to access the full range of life options is to be fully protected then we must be awarded a human right to immigrate”* (Carens, 1992).

And, ”the connection between mobility and the enjoyment of basic human rights is empirically illustrated by undocumented migrants who contest this uneven distribution of mobility rights by claiming their right to migrate to wealthier countries in order to have access to decent living conditions” (Pécoud and de Guchteneire, 2006).

Accepting an encompassing right to mobility, including a right to immigrate, would not be the same as adding yet another right to an already rich plethora of human rights but to better respect and protect existing human rights (Pécoud and de Guchteneire, 2006, Oberman, 2010). It would be a natural extension of what existing rights codified in UNHDR already protects. Articles 13-23 serve to protect individual´ interests in making important personal decisions and engaging in politics ”*without state restriction on the range of options accessible to them”* (Oberman, 2010). In addition to the freedom of movement specified in articles 13 and 14, citizens enjoy (legal) protection to: *”marry and to found a family (Article 16)”,”freedom of thought, conscience and religion”,* ”*freedom of opinion and expression*” (Article, 19) and ”*free choice of employment, to just and favourable conditions of work*” (Article, 23). The protection of these rights is taken to be necessary to safeguard that individuals enjoy ”a full range of life options” i.e. essential interests of personal- and political character that all human beings share and that they should be in control of (Oberman, 2010). Access to these goods enable individuals to decide in matters like where to go, whom to visit and to lead an autonomous and independent life.

Today, these rights only become human beings as *citizens* and only in so far as their authorities manage to secure them. Even if nation states are bound to protect the rights of their members their capacity to do so is dependent on resources. Article 22 mentions that these rights should be realized through “national effort and international co-operation”. At the same time, it underlines that the realization of rights only can be done “in accordance with the organization and resources of each state” (Article, 22). More to the point, nation states´ responsibilities towards non-members are unclear. No other country is obliged to ensure the rights of non-members, neither by allowing entry nor by offering aid.

However, some have argued that even if nation states cannot be morally obligated to open up their borders, affluent, democratic societies should, under critical circumstances, assist members of underprivileged countries by monetary support to redress poverty and unequal opportunities (e.g. Walzer, 1983). However, the idea that inequality and immigration restrictions can be compensated by e.g. development aid, has been criticized. Material support does not further *equal* opportunities. At its best, it fosters “separate but equal opportunities” (Dumitru, 2011). In order to fully protect all individuals´ and not only citizens´*”access the full range of life options”,* a right to immigrate as well as to emigrate is necessary. Closed borders constrain individuals´ life options significantly and a less extensive set of rights (than specified in the UNHDR articles) would not suffice to protect individuals´ autonomy and independence. Given that the international community (UN) already is committed to these rights, a right to immigrate would be a natural prolongation of- and consistent with the reasoning regarding domestic movement.

Against the need for a symmetric right to migrate (emigrate – immigrate), it has been argued that even if an individual cannot expect a specific country to allow her access, there will most likely be at least one door open to her (Heath Wellman, 2011). Just like on the ”love market”, a person cannot expect to marry a specific partner, he or she may still be able to marry *someone,* a migrant will in most cases find at least one country that allows him or her to enter (Heat Wellman, 2011). The relevance of the analogy migration – marriage may be questioned, but more importantly, there is no *absolute* protection against the possibility that she may be left ”in between countries”. Underlying this position however, is the view that legitimate nation states should, for reasons of state sovereignity, be in their right to control and restrict others´ access to their territories and choose immigration policies as they

see fit. The idea that migration management should be considered a matter of state sovereignity has been rather influential (cf. Miller, 2005, 2007) as has the idea that immigration is a factor that in a substantial way shapes a state's character, and hence, that immigration control is necessary for a country to be able to exercize self-determination (Walzer, 1983).

Rather than questioning the validity of these arguments, the case has been made that there is good reasons to adopt a more encompassing right to mobility and that these arguments should be balanced against a fundamental human right to immigrate as well as to emigrate. Basic liberties like moving, associating, speaking, worshipping, working and marrying are "*awarded the same level of protection when people seek to exercise them across borders as when people seek to exercise them within borders"* (Oberman, 2010).

4. Conclusion

Mobility is one of the aspects that the European Union promotes for it´s members. In parallel with the deconstruction of internal borders in Europe and free internal mobility for citizens of EU member-states, the external borders of the European Union have been reinforced and immigration significantly restricted (Huysmans, 2006) – this concerns regular as well as irregular migration. Although all individuals enjoy the freedom of movement within their home countries and a right to seek asylum in another country, no corresponding right to immigrate exist as of yet. Legitimate sovereign nation states are typically considered to be in their right to be self-governing with respect to migration management and to adopt migration regimes without the interference of others. Drawing on the reasoning of among others, Kieran Oberman (2010), it is argued that if we are interested in safeguarding one of the corner stones in the UN Declaration of Human Rights – all individuals right to life, liberty and security of person - individuals should be granted the right to mobility within and across borders. Firstly, the reasons for protecting a right to mobility domestically apply internationally as well. Secondly, if restricted from cross-national movement, individuals are prevented from access to a wide range of options that may not necessarily be available to them domestically. A right to immigrate would be a natural prolongation of and consistent with prevailing support for a freedom of domestic mobility. It should not be understood as an absolute right. Nation states may have valid reasons to restrict immigration and exclude certain immigrants e.g. in cases where immigration most likely would imply *severe* (monetary and societal) costs. However, before circumventing a fundamental human right to freedom of movement, states should demonstrate the necessity of exclusionary practices and surveillance-based border control. Briefly put, nation states´ rights to self-determination should be balanced against individuals´ need for freedom of movement to be able to enjoy the "full set of life options" that rightfully become them.

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THE BRAVE NEW WORLD OF SOCIO-TECHNICAL SYSTEMS: CLOUD COMPUTING

Norberto Patrignani and Iordanis Kavathatzopoulos

Abstract
In this paper we propose an analysis of Cloud Computing as a new kind of socio-technical system. For many organizations, moving ICT from the capital expenditure line to the operational expenditure line, by using "ICT services on-demand" and paying them by consumption, is an opportunity. From another perspective Cloud Computing represents a big shift back towards centralized architectures where end-users and organizations will use on-demand resources provided by very large datacentres. Are we moving from the "autonomy" of the 1980's introduced by Personal Computing to the "heteronomy" of Cloud Computing of the XXI century? For analysing the main social and ethical issues related to Cloud Computing we propose a simple model based on the Socio-Technical Systems concept. The co-shaping between society and technology is clean-cut and can be a useful tool for users and organisations that are considering to enter into the world of ICT *as-a-service*. We finally investigate possible connections between our reflections about Cloud Computing and more deep ethical, philosophical, and psychological ways of addressing these issues.

Keywords
Cloud Computing, Heteronomy, Autonomy, Co-Shaping, Ethics, Decision Making, Methods, Tools, Philosophizing.

1. The Brave New World of Cloud Computing

The promise of the last step in ICT history, known as Cloud Computing, is to have a global infrastructure with the following characteristics:

- network-based, with broadband networks available in most of the countries
- computing servers as shared-platforms, with resource pooling and multi-tenancy
- rapid scalability and elasticity
- measured / metered services (for "billing" purposes)
- on-demand, self-service.

These main characteristics of Cloud Computing, of course, could be implemented *inside* an organization with a large network infrastructure for a more efficient use of ICT resources. In this case often the term "Private" Cloud is used. In this case the data traffic is inside the controlled borders of the organizations, the "*intranet*", and does not cross any public network, all the routers that control the data traffic are internal and under the strict control of the organization. The main issues raise when the user organization use all the services that are provided from "outside", by a Cloud Provider. In this case all the traffic of the organization crosses the public Internet, and only the router (and firewall) that interfaces the organization to the Internet is under its control. After that the data crosses a (undefined) number of routers controlled by other organizations, usually a collection of telcos: it is the "Public" Cloud (NIST, 2013). We will concentrate our attention to the Public Cloud since it is the more interesting from our point of view.

From many small and medium business and organizations, this new scenario is a real opportunity. They are enabled to access any kind of software application from remote (Software as a Service, SaaS), any kind of development environment (Platform as a Service, PaaS) and any kind of ICT resources online (Infrastructure as a Service, IaaS). They can forget about the computer room, the servers' procurement and maintenance, the ICT organization, etc. and concentrate on their core business, they need just a broadband network access and a collection of user-devices (personal

computers, smart-phones, tablets). They can use the devices as a simple surface over the "clouds" (just a browser) for accessing cloud's resources. From the business point of view, the opportunity of moving ICT from the capital expenditure (CapEx) line, necessary for installing and managing a company's ICT *infrastructure*, to a *service* paid based on consumption, that is, into the operational expenditure (OpEx) line, is very attractive. For example, for a small company, like a start-up into a university's incubator, (Public) "Cloud Computing" offers the opportunity of buying very big computing power and data storage capability only when needed, on demand, and quickly.

1.1 Issues of Cloud Computing

From another perspective, this last evolution of ICT drives a big shift towards centralized architectures where end-users and organizations (Cloud Users) will use resources on-demand provided by very large data centers (Cloud Providers). ICT, like a pendulum, in the '70s moved from mainframe towards personal computers, enabling an "autonomy" of human beings (in terms of independence, de-centralized computing, storage and communication resources), now ICT is moving back to a re-centralized architecture where the "heteronomy" and dependency of users will be strongly evident. The new scenario is more and more moving from a peer-to-peer architecture of the historical Internet (Hafner, 1998), towards a new centralized "broadcasting", one-to-many architecture, where end users will just "browse" on the surface of a non-transparent infrastructure. The last step in the evolution of mobile devices is also moving even the "browsing" software execution into the cloud, the user is just using the surface of the touch-screen. The "center of the cloud" could even "shutdown" the machines and operating systems in the hands of the users ("the kill switch") (Robertson, 2012). The risk of losing the status of "digital citizen" and becoming just "digital consumer" is growing.

We can see that we are witnessing a complex dilemma: from one side, this scenario is very attractive, but on the other side, it is introducing a new kind of delegation on ICT infrastructure.

For medium-large companies the question can become even more complicated: usually they want to keep the control of the "border" of the company and access services "outside" their network firewall only for carefully selected, usually non-mission critical, applications. For this kind of organizations there are some risks and issues that need to be addressed like:

- governance: with IaaS and PaaS services models, the Cloud User organization is still controlling the Application and related Services whilst the Servers, Storage and Network layers are controlled by the Cloud Provider; with IaaS service model, the entire ICT "*stack*" of ICT layers, Application, Services, Server, Storage, and Network, is delegated to the Cloud Provider;
- de-perimeterisation: for most organization there will be a loss of "perimeterisation", the traditional boundaries between systems and organisations will disappear, the concept of the security "gate" of the ICT infrastructure identified with the "firewall", considered like a "drawbridge" will lose its status; storage and processing are *outside* the border, inside remain just input, output, and network;
- contractual obligations: if everybody can buy any amount of ICT resources, there will be powerful organizations that will buy them just for re-selling: ICT "*brokers*" are coming, so the Cloud Provider is not the real owner of the resources but just an intermediary; in this chain of domains, who is responsible for what?
- problem of many-hands: the problem of many hands means that too many *administrators* control the critical resources: for example what will happen if a "cloud" administrator decides, for maintenance purposes, to shutdown a service? Will the user-administrator be forewarned? Maybe we will need to setup a kind of "*four-hands authorization*" (the administrators on both sides must *jointly* agree on the execution of some operations);
- risk management: if something goes wrong, will they need to trace the events (Cloud *traceability*)? Will they need to store events in some secure areas accessible only to the implied user (encrypted secure *logs*, *time-stamped* and *digitally signed*)? What kind of

harmonization will be needed between the *risk management plan* of the Cloud User and the one of the Cloud Provider? Shall they need a new kind of "cyber-risk insurances"?

- compliance: Cloud Users will need to know the data location, for example for compliance purposes, some users (e.g. financial organizations, public authorities, etc.) need to know which law applies, in which country are their data;
- open market: if a Cloud User organization will want to move to another Cloud Provider, what kind of freedom to change provider will be available? How will be avoided the risk of monopolies and "lock-ins"? What about the data formats? Will there be some kind of standards that guarantee portability?

Addressing this kind issue is very important and may require special attention when organizations define the service contracts. For example some organizations, for compliance requirements, may require to the Cloud Provider, the *disclosure* of the data location, or that data should be stored only in specific countries, etc.

2. Cloud Computing as a Socio-Technical System

The Sociotechnical Systems perspective suggested by the "Science, Technology and Society" (STS) studies is very important for understanding the evolutionary path of ICT. These are the main STS findings: the belief that technology develops independently from society is wrong; social factors steer engineers in certain directions and influence the design of technological devices and systems; on the other direction, technology shapes society, society and technology shape each other (*co-shaping*); adoption of a particular technology means adoption of a particular social order; systems are infused with social and moral values (Johnson, 2009).

If we apply this perspective to Cloud Computing, we can see it more deeply: what kind of *co-shaping* are we witnessing between Cloud Computing and Society? Why the society of the beginning of XXI century led ICT towards Cloud Computing? What kind of society will be shaped by this new direction of ICT? Will this new "cloudy" scenario introduce us into a very *centralized* society? These difficult questions are still open in front of us. In this paper, more humbly, we would like to provide some decision support tools for the people that have to make choices about (Public) Cloud services adoption, mainly Chief Information Officers (CIOs). We propose to see this kind of decisions as typical *ethical* decisions (Kavathatzopoulos, 2011).

2.1 Cloud Computing: what is right, what is wrong?

We will now develop this analysis of centralized-vs-decentralized socio-technical systems applied to Cloud Computing. We are witnessing a curious shift in opposite directions: the power-grid is becoming a "smart grid", whilst the Internet is evolving towards a (re)centralized topology.

The power grid, the first "critical infrastructure" of our societies that since 1840's is distributing electricity from power stations to our homes (one-way only) is interestingly evolving towards a "smart-grid", enabling consumer to produce electricity (prosumers), with renewable energies, and to sell this energy to the utilities; electricity is no more just distributed from the centre to the periphery but also from the periphery to the network, it is flowing in both directions. It is becoming a "smart-grid", a complex, distributed, flexible, reliable and redundant system (Massoud Amin and Wollenberg, 2005).

On the other side, the Internet, the new "critical infrastructure" of our society is evolving from the *peer-to-peer* original design architecture of the 1970's to a new (re)centralized, rigid (unreliable?) system. Web services, on top of the Internet, are enabling the new Cloud Computing architecture where users risk to lose their autonomy in particular in terms of processing and storage capability (Andrejevic, 2007).

This new centralized architecture of the Web, according to Winner, has some implications also for organizations. The well-known debate about "politeia vs techne", the consequences for the society and

for human organizations related to some technology developments, is opened again in a new scenario (Winner, 1989).

If we analyse different technology choices we can very easily see the different social organizations that they enforce (see fig.1 - Politeia vs Techne). For example we can produce electricity with *photovoltaic systems* on our roofs that convert sunlight into electricity, or with a *nuclear plant*; we can manage a *shop* for selling things or we can have a huge *e-commerce* site; we can fly with an *hang-glider* or with a *Boeing 747*; we can navigate the sea with a *rowing boat* or with an *aircraft carrier*; we can traverse the city with a *bicycle* or with a *car*, or with an *underground*; we can connect our personal computer to a peer-to-peer *open network* like the Internet or we can connect our computer to a *centralized network* architecture (like the IBM System Network Architecture, SNA) (Friend et al. 1988); we can use our *personal computer* for storing and processing data or we can connect it to *Cloud Computing* provider.

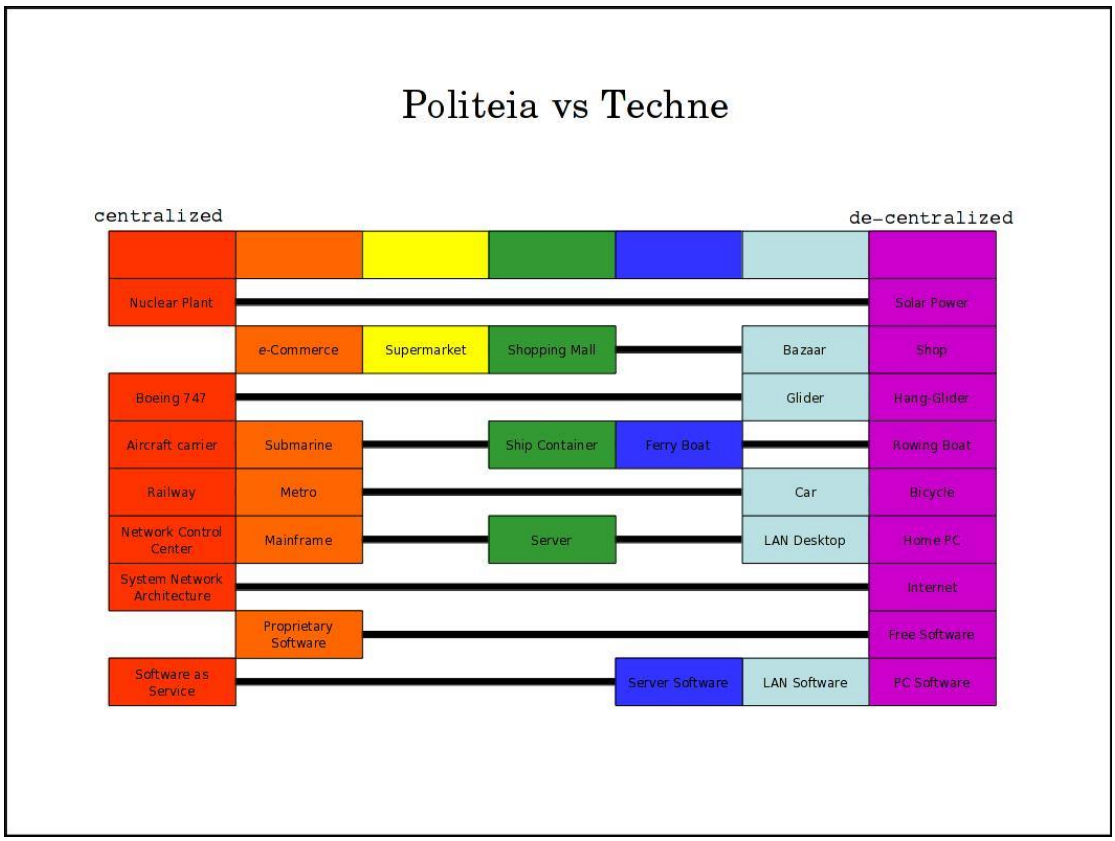

Figure 1: Politeia vs Techne

In this picture it is clear the two opposite poles of a distributed or *decentralized* architecture that supports a kind of "*autonomy*" and a *centralized* architecture that enforce a delegation, a kind of "*heteronomy*".

2.2 Cloud Computing: how to make a decision?

All the above issues related to Cloud Computing poses the decision makers in front of difficult choices. Indeed the simplest decision is sometimes to delegate to the Cloud Computing provider the ICT services (the "heteronomy" way) instead of starting a complicated analysis and research for maintaining locally the ICT services (the "autonomy" way). The pressure of the market offers to Chief Information Officers (CIOs), for moving everything into the "cloud", is very strong.

For example, one of the arguments for moving all datacentres to the "cloud" is that this will save, collectively, a lot of energy. But this is still an open question, since data centres consume vast amounts of energy, and Cloud Providers typically have to run their facilities at maximum capacity, around the clock, whatever the demand. So the real computation use only about 10% of the electricity

consumed, the majority amount of energy is used for keeping servers in idle (Glanz, 2012). In a way, moving to the cloud just changes where the energy is consumed (or wasted).

For a decision maker it is also very important to verify the "portability" of the data and applications, just to avoid to be locked-in with a vendor. According to Sterling, 2013 will be the year of *tactical-broken-bridges*: "*... the stacks ... the 'big silos' (Apple, Google, Amazon, Facebook, Microsoft) are re-making the world in their image... They never compete head-to-head, but they're all fascinated by 'disruption.' What will the world that they create look like? ... Your technology will work perfectly within the 'silo' and with an individual stacks's (temporary) allies. But it will be perfectly broken at the interfaces between itself and its competitors. That moment where you are trying to do something that has no reason not to work, but it just doesn't and there is no way around it without changing some piece of your software to fit more neatly within the 'silo' ... 2013 ... the year of tactically broken bridges*" (Sterling, 2012).

About reliability, all the issues related to software engineering, to the limits of software reliability, to the responsibility of software designers are still there, they just moved into the centre of the "cloud". Indeed the responsibility of computer professionals in designing complex systems (Gotterbarn, 1992; Rogerson and Gotterbarn, 1998) becomes even more important in a Cloud Computing scenario.

When making a decision about *what is right* and *what is wrong* we are going towards a kind of philosophical or, more precisely, an ethical choice. Unfortunately philosophy cannot in itself find solutions for us, or give the right answer automatically. Philosophers, of course, can help us in providing some guidelines for finding the answers to difficult questions like the ethical ones. Philosophy points to the importance of the way we think. Still the dominating interpretation of what philosophers said is to categorize them in a system of normative principles expecting to provide answers to moral problems.

For example Baruch Spinoza suggested a "*relativism*" approach to complex ethical questions and that there are *no universal norms*, merely points to variety of behaviours in different cultures. So the issue of right or wrong is all *relative*. The best approach is to be descriptive about the scenario, not normative (Spinoza, 1677).

Or we can give attention to the lessons from Immanuel Kant, that suggested a "*deontologism*" approach, where an action is right or wrong *in itself*. He stressed the intrinsic character of an act and disregard motives or consequences, focussing on individuals and their rights ("*people should be treated as ends and never merely as means*" (Kant, 1781).

Or we can look into the studies of John Stuart Mills, that identified a "*utilitarianism*" (or *consequentialism*) approach as a guideline for ethical questions: an action is right or wrong depending upon its *consequences* and *effects on society*. Everyone should behave in such a way as to bring about the *greatest happiness to the greatest number of people*. For him, happiness is the ultimate goal of humans and, accordingly, all actions must be evaluated on the basis of whether they increase or decrease human happiness. His focus is on the overall impact of our choices on society (Mills, 1863).

On the other hand we cannot ask to them to give us the correct answers! We can just inherit some useful advises like the needed skills for taking wise decision: the Socratic dialog, the "*aporia*" (a state of no-knowledge), "*throwing aside false ideas, opens one up to the right solution*" (Kavathatzopoulos, 2011).

We can continue with many other philosophers, but at the end, we still have no answers; but we need them. Therefore we have to focus on what philosophy is about: the way we think and how to succeed thinking in the right way, i.e. philosophizing. Recalling Plato, leaders (in this case CIOs) are, by definition, not the persons that *have the right answers*, but the persons that *are able to find the right answers* (Plato, 1992; Kavathatzopoulos, 2011).

If the previous named normative categorization cannot provide answers, we can then look for some answers into the psychology arena. In ethical decision making, we now know that human beings use a way of thinking that can be positioned on one-dimensional landscape where at one extreme there is the "*heteronomy*" way of thinking (not only dependent but mainly automatic, emotional, and uncontrolled) and at the other extreme there is the "*autonomy*" way of thinking (not only independent but mainly systematic, holistic, and self-critical). Many research efforts have now demonstrated this,

surprising simple, one-dimensional law (Piaget, 1932; Kohlberg, 1985). Curiously this is very close to the model of the centralized or decentralized technology architectures described above.

If we cannot ask for solutions to our ethical dilemmas at least we can ask for some useful tools, some decision support tools that can help us in this Cloud Computing scenario. We suggest to introduce the *stakeholders network* as a powerful tool for reasoning and dialoguing about the difficult choices (see fig.2 - Cloud Computing Stakeholders' Network).

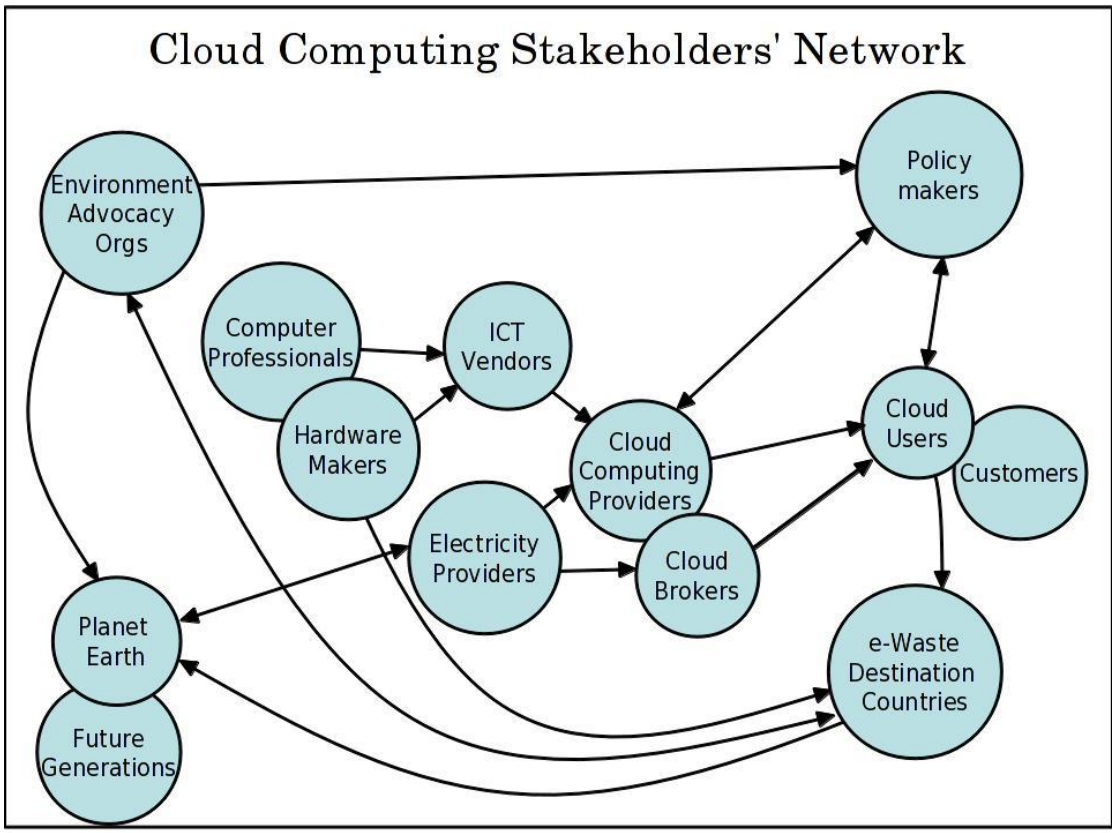

Figure 2: Cloud Computing Stakeholders' Network

In this simple network, we can identify all the stakeholders and their connections and relationships. For example, a Cloud User can access online a Cloud Provider (maybe a broker), then the provider can get power from an electricity provider that have an impact on the Planet, etc.); policy makers can setup some norms about the data location for compliance purposes, or about data portability standards, etc. (see for example the computerized ethical decision making tool ColLab (Laaksoharju, 2010).

3. Conclusions

What we have discussed is not a solution, it is a process, or, more precisely, a tool enabling a process: ethical reasoning. It can be used to easily identify conflict areas and to support decisions that take into account the interest of several stakeholders. In a way these kind of decisions should support the long-term interests of the organizations. This can be considered as an ethical decision support tool (Kavathatzopoulos et al., 2009).

This can contribute to open a dialogue in the ICT community, involving all main stakeholders: computer professionals, users, policy makers, etc. This process can also maintain and support a fruitful dialog leading to applicable principles, norms, laws, rules, and practices. In order to take ethical decisions in a complex scenario, like the Cloud Computing one, we need suitable methods, tools and skills.

This dialog can also contribute to understand the social and ethical issues of "clouds" and to keep the evolution process of the ICT toward this "brave new world" of Cloud Computing as transparent as possible.

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SLOW TECH: TOWARDS GOOD, CLEAN AND FAIR ICT

Norberto Patrignani and Diane Whitehouse

Abstract
Slow tech is a new way of looking at technology. It means designing and developing technologies that are 'slow', with the aim of being good, clean, and fair. It has, as an aspiration, the design and use of a new kind of information and communication technologies (ICT): ICT that is human-centred, and that takes into account both the limits of the planet and those of human beings. The focus of this reflection paper is on ICT that speaks to the needs of the environment and society, and is thus implicitly ethical. It contributes towards promoting slow tech to an audience of computer professionals and computer end-users.

Keywords
clean, environmentally sustainable, ethically acceptable, fair, good, information and communication technologies (ICT), slow tech, socially desirable

1. Introduction

Until recently, the concept of limits has been completely peripheral to the information and communication technologies (ICT) world. The free pass that was previously reserved for ICT – and the many aspects of the technology lifecycle – is now beginning to be seriously questioned. ICT is losing its immune status. The long-term sustainability of society, and the widely disparate elements of ICT embedded in today's societal settings, are now being assessed from both their environmental and social viewpoints (Whitehouse et al, 2011).

Human beings have always challenged their own limits. Nevertheless, it is sobering to challenge the concept of planetary limits, as did the Club of Rome (Meadows et al., 1979). It is also vital to consider the limits that may apply in an increasingly technological world to data transfer and conservation; environmental sustainability; human sensory and intellectual 'bandwidth'; and in terms of institutions, organisations and politics (Patrignani & Whitehouse, forthcoming).

This paper examines two areas in which exploring limits is particularly important: the environment and society. It shows in what ways contemporary technologies pose both challenges and opportunities in these two domains. Most concretely, it introduces an approach which it calls slow tech – a parallel with the concept of slow food – that indicates how to position ICT in terms of three important criteria: good, clean, and fair. The paper then explores three case study examples of technology approaches that can be taken to illustrate the slow tech idea. The first describes a sustainable technology that does not damage the environment; the second examines an organisation-wide approach to ICT; and the third introduces a desirable technology that enhances well-being (Green@Hospital, undated; Olivetti, 1959; WSJ, 1965; Loccioni-Humancare, 2012). The paper goes on to discuss the issue of slow tech in a more analytical way, and to reach a number of conclusions. This final discussion suggests how slow tech as an initiative could be taken further: for example, how it could be applied and implemented in domains populated by computing decision-makers, professionals, and end-users.

2. Slow Tech: An Overview

In 1989, an international grassroots organisation called slow food was founded. Its goal is to "counter the rise of fast food and fast life" (Slow Food International, undated). It concentrates on the concept of food that must be good, clean and fair (in the sense of just or equitable). The slow food movement introduced a process of reflection on the entire food-chain.

Carlo Petrini, founder and main inspirer of the movement, describes slow food as food that must be good (or taste good), and must be a pleasure to eat. Good food is prepared by rediscovering local

histories and traditions (such as ancient recipes based on wisdom, that are usually transmitted orally from one generation to another). He suggests that, while people eat, they should reflect on where the food come from. Good food must be selected according to properties of quality. It must be produced following criteria that respect the environment – it must be 'clean' – and it should promote biodiversity and sustainability. Last but not least, the cultivation and production of food must also respect the rights of farmers (it must be fair) (Petrini, 2007; 2011).

Similarly, therefore, we propose a slow tech approach that begins with a reflection on the whole of the ICT value-chain. We suggest applying the same concepts developed in the slow food movement – of good, clean, and fair – to ICT. We call this collection of socially aware and ethical characteristics, slow tech.

We explore, in three sections, the character of good ICT, clean ICT, and fair ICT, starting – in each case – from the meaning of good food, clean food, and fair food.

2.1 Good ICT

Good food is delicious and pleasant. It stimulates the sense of taste and involves all the other senses in a complex and enjoyable experience, extending to the entire body and mind. Can we imagine a similar experience with ICT? Can we transform our interaction with computers into an enjoyable experience?

ICT can be good for human beings when the systems are designed using a human-centred approach. In this case, good means good for us as human beings, and good for our being. Slow tech can enhance the human experience and, at the same time, reduce the human effort to do certain necessary, but sometimes less pleasant, tasks. Human beings have certain characteristics: they forget, they become distracted, and they become old. So, it is important to concentrate more on the complex interaction of the human and the technology. This sophisticated interchange can be an enjoyable experience only if the system and the human-computer interfaces are designed to take human limits into account.

Thus, slow tech implies a search for a new balance between rational thinking and more aesthetic thinking, in which beauty plays a fundamental role. Good ICT means taking into account all the senses of the body, for example, so that it supports people in dealing with diseases or it specifically helps elderly people or people with disabilities.

Good ICT can also help people to find an appropriate balance between working time and free time or leisure, between the time needed for work and obligations, and the time needed for themselves as human beings. Nowadays, there is a risk that ICT is transforming and accelerating people's daily lives, and transforming successive states of 'doing' and 'being' into a single state of only 'doing'. The 'always on' capability provided by ICT involves the danger of having a major impact on people's lives. A 2012 research study on this subject showed that only a small number of organisations has a formal work/life balance policy in place. For example, only 1% of the organisations studied had "days or time when email is not used" such as "e-mail-free Fridays" or "mail-free week ends" (SHRM, 2012).

Good ICT cannot just be the result of a technology push, it must involve users and society in the design stage itself. It needs to be the result of a participatory design[1] approach (CPSR, 1996), and a technology assessment that minimises the risks related to complex software systems (Rogerson and Gotterbarn, 1998; Gotterbarn, 1992).

Good ICT, in summary, means human-centred ICT: technologies that improve human well-being and well-living.

[1] Participatory design is an approach to the assessment, design, and development of technological and organisational systems that places a premium on the active involvement of workplace practitioners (who are usually the potential or current users of the system) in design and decision-making processes.

2.2 Clean ICT

Clean food means that neither its production nor its consumption harms the environment, animal welfare, or human health. By extension, clean ICT focuses on avoiding harm to the environment and human health.

Clean ICT means computer systems and networks that are respectful of the planet, and that are designed and produced while taking into account their impact on the environment. In the past, ICT was always accepted since it was perceived as being 'good' by definition.

However, high tech generates toxic hazards throughout its lifecycle (from design, production, consumption to disposal). People are now therefore starting to take into account the entire ICT life-cycle and its environmental impact: from the raw materials involved, to ICT and ICT applications' use, to e-waste management and recycling (Patrignani et al., 2011).

A major environmental impact arises due to the need to power ICT: particularly in the cloud computing era, the energy necessary to power gigantic data centres doubles every five years. The consequent demand for electricity, and a related increase in CO_2 emissions, has a climate change effect around the same level as that of the airline industry (Fettweis and Zimmermann, 2008; European Commission, 2012).

Clean ICT also means a serious consideration of the destination of the hardware at the end of its life. Despite some advances made due to recent European legislation, at a global level the vast majority of e-waste goes to unknown locations. At its destination, its precise treatment is also unknown. This lack of regulation implies a high risk of eventual environmental pollution, due to the undefined treatment of the hazardous substances such as lead, cadmium, chromium and mercury that the ICT products contain.

For these reasons, since 2006, Greenpeace has been monitoring the ICT industry strictly. However, even the cleanest ICT industry and the most efficient recycling mechanism cannot cope with the growing speed of ICT consumption. This fact explains Greenpeace's final recommendations about extending more generally the lifetime of existing ICT devices, and for consumers to purchase only what they really need (Greenpeace, 2012).

In a way, this is a quest to slow down the ICT life cycle. Clean ICT aims to extend the ICT life cycle by reducing the replacement rate of ICT devices.

2.3 Fair ICT

Fair food implies affordable prices for consumers, and both fair conditions and equitable pay for small-scale food producers. Similarly, fair ICT can be defined as respectful of the human rights, self esteem, and health and safety, of workers in ICT manufacturing and, of course, ICT users.

Fair ICT must take into account the interests of all stakeholders involved throughout the value-chain. From manufacturing, data centre design and recycling, to the creation and execution of software applications, the entire ICT lifecycle needs profound investigation by all the stakeholders involved along the line or throughout the network.

Among the many issues involved in creating fair ICT, to the fore is securing a good quality of working life for all, wherever the workers are located around the globe and whatever their age. Towards the end of 2012, it is now being acknowledged that small improvements may be taking place in, for example, Chinese ICT manufacturing companies. Nevertheless, it is still recognised that profound positive organisational changes may be required for many more decades (Bradsher and Duhigg, 2012).

Fair ICT means open ICT, an ICT that contributes positively to the economy and society through the enabling of its innovation potential. If a product is completely closed (so that no other user else can develop it or program it), then its innovation potential is restricted. Only the corporate owner of the product (or, in many situations, the patent's owner) can take advantage of this closed situation if and when consumers like the product and buy it.

In contrast, innovation in ICT is strongly based on the availability of openly defined layers, through which others can use, adapt and improve the systems and technologies. For example, the openness of the basic protocol of the Internet, TCP/IP,[2] enables anyone to define new applications on top of it (and to develop new physical channels for transporting bits under it). This is one of the most well recognised proofs that an open definition of standards is the main trigger for innovation and for the generation of social and economic benefits.

One of the most famous examples of open source hardware[3] is the Arduino platform (Arduino, undated). If we seek to apply the same concepts to open software[4], it is then possible to imagine the immense innovation potential of ICT. For example, the current contribution of the open source software to the economy of the European Union has been estimated at €456 billion a year (the direct cost savings of €114 billion in licences, and the indirect cost savings of €342 billion in terms of reduced project failures due to the better quality of open software, lower costs for code maintenance, and increases in productivity and efficiency) (Daffara, 2012; Hillenius, 2012).

Fair ICT can provide a significant contribution to community value by stimulating the creation of local high-tech companies, and organisations that support clients' companies through the development of new business models. These initiatives provide consultancy, and they personalise, customise, and maintain both hardware and software applications.

3. Slow tech: Three case study examples

What, then, does slow tech mean in practice or when applied to the real world?

Three case studies relevant to slow tech can be explored to illustrate this. All three of the case studies aim for good ICT. However, some focus more on the notion of clean, and others on an approach to fair. Generally, the cases use technology to reduce damage to the environment; they concentrate on goodness and fairness; and they develop technology in a way which takes the notion of smartness further. Two of the three cases are associated with health, well-being, and health systems in different parts of Europe.

Other examples from around Europe or the globe could have been proposed instead: indeed, the number of exemplar cases is growing steadily. However, the three examples selected have all been chosen specifically as coming from Italy for two reasons. First, it is the country of origin of slow food, despite the movement's expansion into an international programme over the past 25 years. Second, it is the home of one of the authors, and the examples cited are very familiar to him.

The Green@Hospital case is a version of sustainable technology that does not damage the environment; the Olivetti case refers to an ICT company which – although now an entity within a much larger corporation – had a reputation for its focus on the goodness and fairness of its approach to innovation, and design of products and processes; and the third case, Loccioni-Humancare shows how desirable technology can enhance well-being.

3.1 Green@Hospital

Among several new large-scale pilots are three that focus on environmental and sustainability concerns – they investigate hospital energy reduction: Green@Hospital (Green@Hospital, undated), Hospilot, and RES Hospitals.

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[2] Transmission control protocol/Internet protocol (TCP/IP) form a set of communication protocols that the Internet uses. it provides end-to-end connectivity.

[3] Open source hardware is a recent phenomenon related to hardware design that is open to everyone. It includes the bill of materials, printed and integrated circuits layouts, schematics, and of course the software needed.

[4] "Free and open software" was defined by the Free Software Foundation in 1985 as being related to users' freedom to run, copy, distribute, study, change and improve software (Free Software Foundation, undated).

Hospitals are large energy consumers (Ibid, undated). In most European countries, there is a high proportion of ageing building stock (a status that affects the majority of public and private buildings). Hospitals are among the least energy-efficient of the Union's type of public buildings. There is thus an important need to achieve real energy savings from existing hospital building stock. At the same time, when new hospitals are built (as many are), they need to be more sustainable (Ibid, undated).

The Green@Hospital pilot is a particularly interesting initiative that started in spring 2012. It aims to integrate the latest ICT solutions into hospitals for environmental purposes. Its goal is to obtain a significant energy saving in existing hospital buildings through two mechanisms: first, a more effective management of energy resources and, second, a reduction in energy loss. Its challenging overall objective is to achieve a 20% reduction in hospitals' consumption of energy. A Web-based Energy Management and Control Systems (called Web-EMCS) is to be developed:

"It will integrate, monitor and control multiple buildings systems at the component level. Moreover models to assess the energy savings will be developed and algorithms for consumption optimisation implemented." (Ibid, undated).

The developments are being trialled in four case study hospitals in different European countries. Two are located in the Spanish region of Andalucía, in the cities of Barcelona and Granada; another is based in Chania, Crete; and the fourth is the university hospital of Ancona, Italy. They are to demonstrate the validity of the solution that has been proposed under real-life operating conditions. Each hospital will trial different aspects of the overall plan.

The study acts as a basis for replication of the solutions developed. The potential savings and return on investment identified can, it is anticipated, be taken on board elsewhere. As with all the other large-scale pilots being undertaken, it is hoped that the findings can be repeated eventually on a much wider scale and more comprehensive outcomes.

The study's focus is on the development of ICT, used in place, that can develop a cleaner environment.

3.2 Olivetti

A second, historical, case study is the thinking and work of one of the 20th century's most important Italian industrialists and visionaries: Adriano Olivetti (Ivrea, 1901-1960). Olivetti was able to develop high-tech, innovation, production, profit, solidarity, social responsibility and beauty in a joint enterprise. Some examples of his company's developments include: in 1959, the first mainframe computer based on transistors, the Olivetti ELEA 9003, designed by Ettore Sottsass, one of the most famous designers of last century; in 1965, the first personal computer, the Olivetti P101, designed by the architect Mario Bellini (WSJ, 1965); and, in 1962, the building of the Olivetti Electronic Center, located between Torino and Milano, in Italy, designed by Le Corbusier (Olivetti, 1959).

Many of Olivetti's ideas were leading forerunners of the notions of good and fair ICT, in buildings and environments that were also good, fair, and beautiful.

3.3 APOTECAchemo by Loccioni

A third, more recent, case-study is called APOTECAchemo.[5]

APOTECAchemo is a robotic application for hospitals developed in 2010 by the Italian company, Loccioni. Developed with the contribution and participation of nurses and clinicians who come from a combination of local hospitals and who gather together in a dedicated forum, it is now used in many hospitals around the world. The robotic arm system prepares very precise pharmaceutical dosages needed for cancer treatment. It produces careful and exact weightings of all the chemical ingredients

[5] The word APOTECA is extracted from the Latin or Ancient Greek for a storehouse, which is now used with the meaning of a pharmacy.

necessary to treat severely ill patients, and it manipulates the substances in a way that ensures a high level of safety for all the people involved in the process:

"... The manual preparation of cytotoxic drugs has a high possibility of dosage errors with serious consequences for the patient and high professional risks for those who remain exposed to carcinogens of cytotoxic drugs. Patients are protected by humancare high-tech solutions that recognize the active ingredients ... The tracking system of all phases, based on a barcode, allows a perfect integration between the department and the oncological pharmacy service ..." (Loccioni-Humancare, 2012).

APOTECAchemo is an ICT solution, based on an integrated approach, that places the patient right in the centre of the hospital workflow. Thus, it reduces the costs of customised therapies, validates them, and makes health systems more efficient, sustainable, and human (Ibid, 2012). Such well-being is a concept that is likely to come to the fore in the next phase of the information society.

APOTECAchemo is very close to the concept of slow tech. It is good, clean, and fair. It is good because it has been designed with the goal of ensuring the safety of patients and nurses. Participatory design was fundamental to its development: a community of patients, nurses and hospital professionals is continuously collaborating to monitor and improve the solution. It is clean: the Loccioni company is a famous example of a joint approach to innovation and environmental care. In 2010, the company received the National Innovation Award from the President of Italian Republic and the National Enterprise-Environment Award from the environmental association, Legambiente. It is also fair, since Loccioni has defined and demonstrated a strong sense of corporate social responsibility that puts people always at the centre of its strategies and activities.

4. Discussion and conclusions

Human beings, and the planet itself, are finding it difficult to cope with the accelerating speed of ICT, and the tempo of its accompanying, fast-moving, clock. Thus, this paper focuses on a need for slow tech, that is, on ICT that is good, clean, and fair. It integrates the justification, background, analysis, analogies, and examples needed for this new approach to technology.

Slow tech is put forward as a means of re-thinking the pace of development of ICT that, until now, has been celebrated because it has been getting faster and more powerful (stronger) every year. The future could mean an environment in which it would be possible to work with pleasure and a more profound sense of life; where ICT could support individuals and society through many ways of working, and acting collectively and collaboratively; and yet in which ICT can remain as a companion throughout people's lives.

Slow tech certainly implies a critique of much of the status quo in which many of the current challenges described, conditions and directions taken, are seen as unavoidable. It is proposed, not so much as a single solution, but as an invitation to initiate a reflection around current ICT values and uses. It is a call to work together on combining the environmental, with the social and the ethical, in a more considered and reflective way. These three dimensions of good, clean and fair can be worn like a new pair of glasses, as a new way of seeing.

Slow tech could eventually permit a kind of return to a more leisurely pace. It is a humble proposal for a new direction to take. It provides a form of compass or tool or instrument that can help to identify new or alternative futures.

While slow tech could be used to develop a standard or a brand to be adopted in the future, it should certainly not be seen as a pure, formal checklist of items to be ticked off a list of achievements.

This journey or quest could also, ultimately, be expanded intellectually to include a further six dimensions, adopted from two separate authors (Langer, 1996; Von Schomberg, 2012). Attention needs certainly to be paid to the concepts of slower, deeper, and sweeter (Ibid, 1996) and socially desirable, environmentally sustainable, and ethically acceptable ICT (Ibid, 2012).

Purely as examples of how the slow tech idea could be adapted more precisely, two proposals follow. For educational policy-makers, including universities, slow tech could be used to expand the curricula to encourage computer science and engineering students to focus on these three dimensions of good,

clean, and fair. Similarly, professional computing organisations or associations could enhance their general codes of conduct and professional guidelines to include the same three dimensions, with the dual intention of affecting their own members' behaviour as well as promoting a message to be sent out to a wider community of computing professionals and computer end-users.

These insights into the slow tech approach are, ultimately, offered as a possible opening of a dialogue which – to paraphrase a commentator in this field – can be seen as being around a route to general awareness and acceptance of "the brakes required in the technological Indianapolis"[6].

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HOW TO DESIGN SOFTWARE TAILORED TO THE STAKEHOLDERS' NEEDS?

Małgorzata A. Płotka, Donald. Gotterbarn, N. Ben Fairweather and Sara H. Wilford

Abstract

It would be absurd to design a pen without asking people who write a lot about how best to finish it. Good design might also involve asking people who want to write but who have difficulty with existing pens: potential end-users. Similarly, if we wanted to build a racing car, who better than a racing driver to seek information from? We could arguably say mechanics, electronic, engineers etc. If we were software developers we would also be correct, because it is important to see software in context to not miss its important impact on numerous other stakeholders. Unless we are privileged enough to have been domain experts we have to evaluate, cross-reference, question and/or seek people who truly understand what and how the product needs to be developed. The answers are seemingly obvious to most of us. Yet somehow, more often than not, this simple criterion of marrying up design and end-users and other stakeholders is not met. Even when techniques are used to identify all those impacted by the system needs there are still difficulties with the software.

Keywords

Work support, positivist case study, risk analysis, requirements engineering, requirement identification, stakeholder identification

1. Introduction

What makes IT undertakings so difficult that still many projects are not completed, or even if the product is successfully deployed, it is not widely accepted (Kawalek, 2008)? A specific problem of IT products is that most of the time we work on something that has no shape and is instead virtual, and abstract (OGC, 2009). Of course, there are some standardised analyses, approaches, methods (e.g. BPMN, UML) (OMG, 1989-2013) and CASE tools that come to developers' assistance (Pressman, 2009). They enable us to describe hard to imagine topics to project team members and, of key importance, the client. But it still seems to be not enough to reflect clients' needs in software requirements to let us prepare good software. Inviting all stakeholders that can be affected by IT products would resolve the problem, but is it really so easy (Gotterbarn, 2001)? Although standard software tools focus on the logical/virtual structure of the software they do not help the developers anticipate problems that arise in a variety of different contexts (Humphrey, 2005).

So, there is a methodology needed to help proper identification of key stakeholders which takes into consideration, their competence and knowledge about the project and its context. It is also important to involve them in the IT project itself in order to gather information (stakeholders' needs/requirements). This can be useful when considering the ethical impact of that software in the development process. This paper describes attempts to bring a problem to light and plans/ideas about how to resolve that problem. We use case study design (Fernández, 2004), collected in research and professional work within IT, in order to develop a theory from the conceptual framework to analyse the problem, develop a methodology to enhance software requirement engineering and show the results. For this purpose modification of stakeholder and task identification in SoDIS Analysis is the focus to fill the gaps in requirement engineering and make a substantial contribution to knowledge.

The structure of the work is as follows. After this short introduction, Section two briefly describes the problem being examined. The third section discusses the way of building a methodology. The work ends with some brief conclusions to acceptance in the further work.

2. Analysis of the problem: what is it with these requirements and stakeholder identifications?

Numerous surveys, and the experiences of software engineers, provide lists of the main reasons why so many IT projects fail describing problems in a quantitative way (e.g. coming behind the budget or schedule) (Gula, 2012; PMI, 2012; The Standish Group,1994-2009) and just a few in a qualitative way (Kawalek, 2008; Humphrey, 2005). Many of these issues concern human–computer interaction (via user interface) such as failing to offer provision for any disability. Specification and verification of these non-functional requirements may be difficult to identify because some of them are not easy to describe in a way that can help to avoid misunderstandings by different stakeholders (Leffingwell and Widrig, 2003). What does it mean to say that software will have a user-friendly interface if there are no provided characteristic details of its use and applications? Requirements formulated without sufficient detail may cause problems with verification – someone else could understand it in a different way. That may result in the challenges surrounding requirements i.e. not matching/tailoring stakeholders' needs.

2.1 From requirements to the technical characteristics of software

If you want to find out the interface between subjective customer perception and objective technical requirements you need to complete and specify a list of requirements independent of individual client perception. For this purpose methods such as QFD (Felice & Petrillo, 2010), RDQC (Szejko, 2005), A-Kano (Xu et al, 2009) may be used. Although such techniques primarily address functional requirements there is no obstacle to using them to "translate" any stakeholder requirements (including non-functional ones) into technical characteristics. Both QFD and RDQC have already been used to arrange a complete list of requirements and identify significant factors/characteristics (Płotka, 2007). The set of technical characteristics (the "voice of organisation") depends on the choice of quality model (e.g. ISO 9126) and may be freely extended with new characteristics.

Quality function deployment (QFD)

QFD is a method (Akao, 1972, 1990, 2004) used to translate the "voice of customer" into technical characteristics, the "voice of organisation". Figure 3 shows the "House of Quality" (Figure 3), matrix used by QFD method (Felice & Petrillo, 2010):

1. Customer needs can be thought of as the "voice of customer"
2. Engineering characteristics can be thought of as the "voice of organization" provided by quality model
3. Relationships can be thought of as the extent to which the characteristic of quality assurance ("voice of organization") will affect compliance with the specific requirement ("voice of customer")?
4. Technical Matrix can be thought of as the prioritisation of technical requirements
5. Technical Correlations can be thought of as the correlation of technical characteristics
6. Planning Matrix can be thought of as the specification of the importance of customer needs, competitive products and the degree of completion of a product

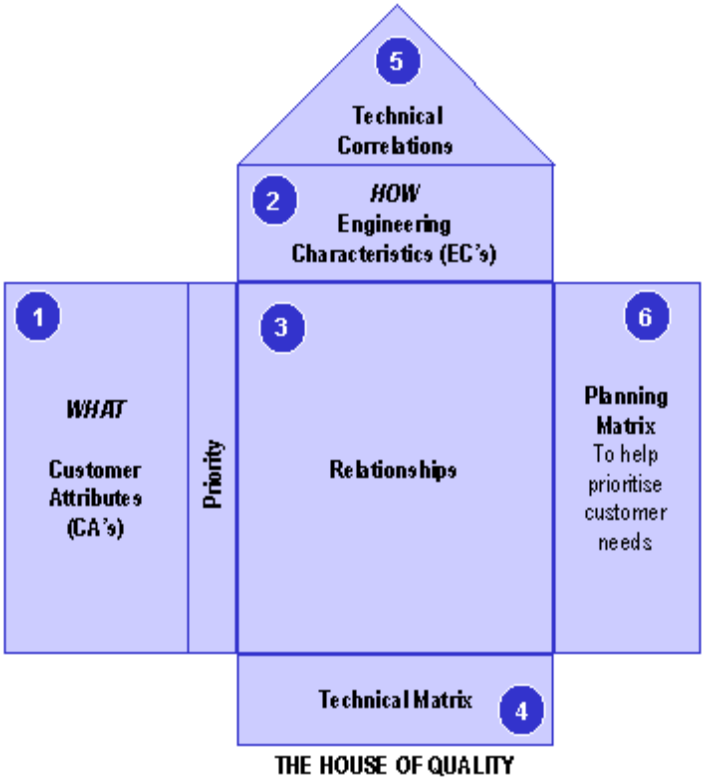

Figure 3: House of Quality (source: (IfM, 2003))

Requirements driven quality control (RDQC)

RDQC (Płotka, 2007) is a modification of the QFD method proposed by Szejko (2005). The main change is an application created by Kawakita (Kasai, 2008) the KJ Method (affinity diagram, 1960s) to group requirements and the admission of setting negative correlation between customers' and technical requirements. In QFD correlations are determinate. Without a defining relationship they are either positive or negative.

An analytical Kano (A-Kano) model

An analytical Kano (A-Kano) (Xu et al, 2009) model is an extension of the Kano model (Li et al, 2009) aimed at analysing customers' needs proposed in 1980 by Kano (1984). A traditional Kano diagram enables the "capture of non linear relationships between product performance and customer satisfaction" (Yu & Ko 2012), uncover, classify and integrate product attributes based on subjective information collected from customers, and distinguishing three categories of attributes:

- threshold, basic (expected) – "must be" requirements
- performance (expressed) – improvement of product
- excitement (unspoken) – unexpected features

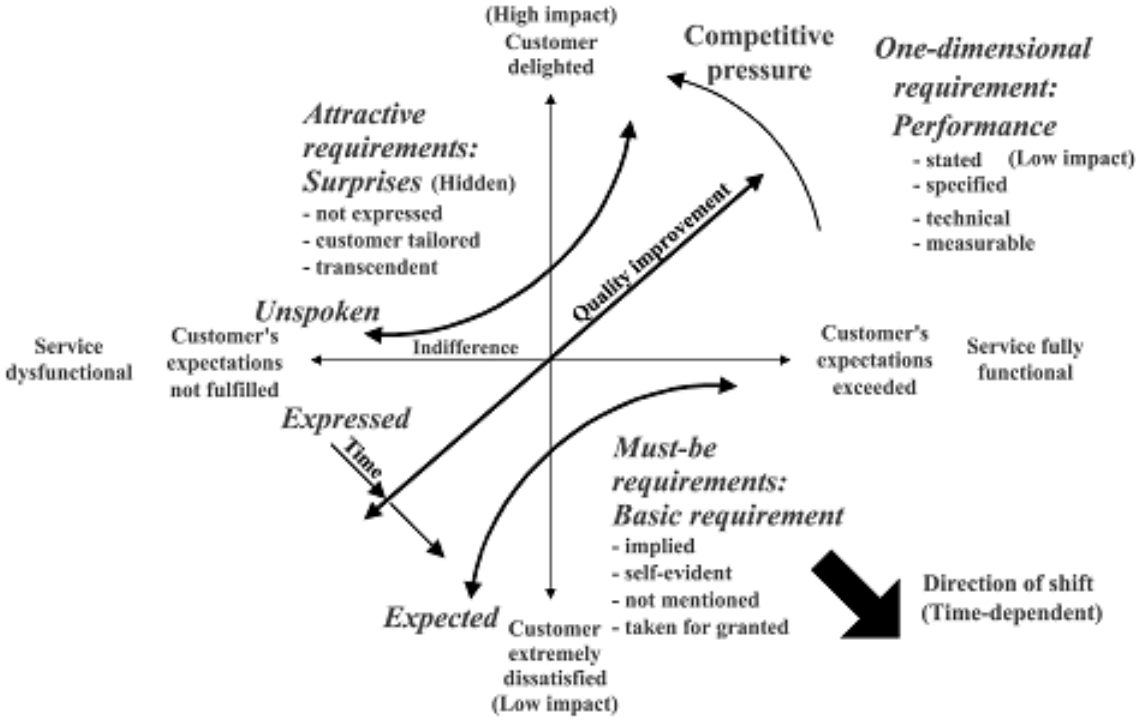

Figure 2: Kano model (Kano et al, 1984)

A-Kano models' (Xu et al, 2009) extends an original model with:

(1) Kano indices – quantitative measurements of customer satisfaction

(2) Kano classifiers – set of criteria to classify customer needs

(3) Configuration index – factors supporting selection of the functional requirements

(4) Kano evaluator – indicators of customer's satisfaction and producer's capacity.

Use of Kano and A-Kano modeling helps to transform subjective customer perception of software into verifiable product attributes and requirements (Xu et al, 2009). However, in this research, the groups of interest cannot be restricted, as it is in an original Kano approach to customers, and this may lead to missing important pieces of information.

Application of the methods described above enables us to translate stakeholders' functional requirements into technical characteristics of software in order to avoid problems arising from different, subjective understanding of stakeholder needs. Subsequently for the prioritisation of requirements (and establishment of criticality), decisions should be made about which of the requirements have to be implemented, which may increase the quality of the product, and which ones are just unexpected features and so their implementation may be postponed. The establishment of criticality of requirements helps to determinate the order of implementation of particular functions, with consideration of necessary/significant quality characteristics. It should be noted at this point that according to Arrows' impossibility theorem (Tang & Lin, 2009) consideration of a group of three or more people with distinct concerns (viewpoints of application) such as customers and developers may not lead to a consensus about the shape (list of requirements) of software to be developed. To reduce the chances of this causing a problem it may be that at least two meetings (business and technical) are needed to identify a complete list of requirements. This approach was applied in Inspection, extension of SoDIS Analysis developed as an answer to the problems that appeared during applying the SoDIS process to the e-voting – project conducted with the UK government (see (Gotterbarn et al, 2009, Fairweather & Rogerson, 2002)).

2.2 Stakeholder identification

Even if there is a stakeholder identification process it probably would not include all the needs of the people "whose behaviour, daily routine, work process, (...) circumstances, job, livelihood, community (...) or experiences will be affected by the development and delivery of the project" (Gotterbarn, 2001) and who properly would be considered as key stakeholders. Thus, developers of software supporting administrative work in a big state enterprise did not take into consideration the context of end-users' (even when the end-user was known), and have prepared software that does not sufficiently support their work (Płotka, 'in preparation'). Lack of careful social-ethical analysis led to ineffective stakeholder engagement. Users and service recipients suffer the consequence of this process.

Just involving stakeholders in different project life cycles does not resolve the problem of contextualising the software. Some methods, such as agile software development, assume implementation of so-called user stories (Moreno & Yagüe, 2012), but they are 'user' stories and do not address issues about how the software will impact on society and others. Other, traditional approaches (such as the waterfall model) hardly involve the user in the project at all. Even if they did involve the end-user they would still miss many critical stakeholders. Whatever methods are used, there are always consequences. We need to be aware that the precise nature of the consequences depends on the choices made.

Stakeholders' role in project life cycle

The division into technical and non-technical stakeholders could be one of the simplest distinctions due to their role in development. The non-technical, analytical group (an ordering party, a business analyst, an end-user, a community etc) could look from a business perspective. By contrast, the technical group (developers, project team, etc) could concern itself with development activities. It is of paramount importance in doing so for them to not omit the needs of the non-functional group of stakeholders. We could say that the first one is obligated to specify a piece of software to be implemented and deployed by the second one. Not taking into consideration the voice of non-technical parties probably will result in preparing software that will not meet their needs. This can be avoided by good management procedures. The task may be hindered by the fact that both groups have different concerns and a different understanding of what should be done to rectify them. In the end, the completed task must be accepted by the ordering party. It seems to be logical that avoiding misunderstandings about the context and the shape of the application design increases chances of implementing software that fulfils actual stakeholder needs. A list of stakeholder roles can vary according to the type of project (Gotterbarn et al, 2009) as well as the chosen software development method (even if the substantive list of stakeholders does not vary, the way they are grouped into roles can vary) (Płotka, 'in preparation').

Stakeholders' viewpoints

Stakeholders may have different viewpoints and interests (concerns) in the system. They have different roles, knowledge, experience, age, capabilities, methods and tasks they may wish to put the future system to (Rozanski & Woods, 2005). It may happen that people with different/opposing views specify one or more of the requirements. This may cause 'overlaps' in specification that are difficult to resolve later. How do software designers decide whose opinion is more important: the boss who orders and pays or the person who will use the product and has the best knowledge about the specifics of the work that this tool will support? Sometimes a lack of information or client knowledge also leads to 'gaps' in the requirements list.

IEEE Std.1471 (2001), Recommended Practice for Architectural Description of Software – Intensive Systems defines a stakeholders' viewpoint as "a set of conventions for constructing, interpreting and analyzing a view in terms of viewpoint languages and notations, modeling methods and analytic techniques to be used to address a set of concerns held by stakeholders. A viewpoint covers one or more concerns and stakeholders." By contrast, a view is "a representation of the whole system from the perspective of a related set of concerns. A view conforms to exactly one viewpoint". Figure 3: 3 shows relationships between stakeholders' concern, viewpoint and view of the system.

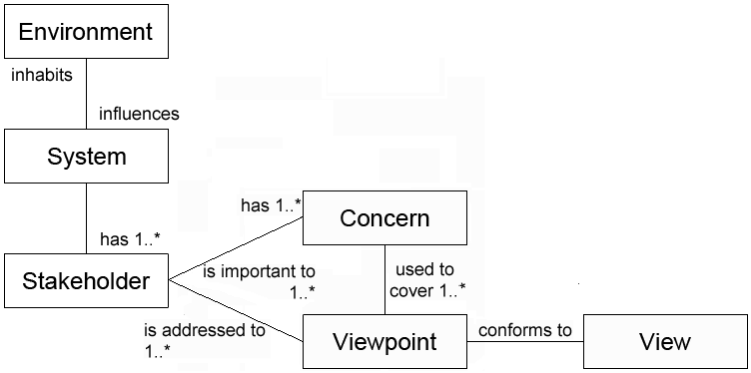

Figure 3: A conceptual diagram of the stakeholder's viewpoints and concerns of system basis of the IEEE Std.1471 (2001)

SoDIS in the service of requirement engineering

Although SoDIS is well known as a *software development* risk analysis method taking into account interests of a broad range of stakeholders' representation together with analysis of impact that the software may have, there are justified reasons for using it in the requirement engineering process too. Firstly, many surveys indicate that working on unclear objectives and requirements is one of the main reasons for IT project failure. Secondly, SoDIS, similarly to any correctly conducted requirement engineering process, starts with stakeholder and task identification, and involves analysis in order to mitigate and/or avoid qualitative, social-ethical risks. Thirdly, SoDIS Inspection Context Scoping (Gotterbarn et al, 2009) is a substantial contribution to stakeholder identification. To summarise, a similar approach applied into the requirement engineering process might come in useful in detecting gaps (e.g. those caused by lack of information or client knowledge) and/or overlaps (e.g. those caused by the different points of view of stakeholders).

3. Building up methodology

In order to conduct on-going research it was necessary to establish the methodology that was the most suitable for resolving the problem, as well as answering the questions set out above. The most appropriate way to carry out this study is a qualitative approach that enables an in-depth exploration of the research problem while being compatible with seeing the world in a positivist way, in that it can be objectively studied – assuming the theories and hypotheses as testable and independent of interpretation and explanation. On the positivist view there is just one logical reality that exists "out there" (Merriam, 2009) and a researcher looks for parts of phenomena, the world under examination, to build theory and understand it. For this purpose case study and a grounded theory approach are adopted as methods complementing each other. For this study a position is taken that selection of measurable variables/factors and characteristics lead to understanding of parts of phenomena where the nature of the studied topic cannot be changed by the research process. Thus for this study the nature of physical and social "reality" in describing research (ontology) is objective. The nature of knowledge and how it can be obtained (epistemology) is inductive-deductive (see 0. 3.2 'Glaserian' and 'Straussian' point of view).

An interpretivist stance which assumes an intuitive and individual perception in the world has also been considered. Arguments supporting that choice might be the conviction that if a system fails to meet requirements, this failure is understood as a failure to meet requirements from the personal perspectives of the stakeholders. However, despite the involvement of individual perceptions, requirements collected according to specification should be formulated in ways that increase their equal understanding, and verification by different people, beginning with both the technical and non-technical groups (see section 2.2).

3.1 Positivist case study research

In the literature, the opinion is presented that the case study is the most commonly used among qualitative methods in information systems and computing research (Verner et al, 2009, Runeson & Höst, 2009). This is especially the case where there is a need to answer questions such as "why" or "how". However, examples of successfully constructed positivist case studies (Shanks, 2002) are also provided. In the larger research project (Płotka, 'in preparation'), of which this paper is an early output, analysis of case studies collected during observations, interviews and conducting a literature review enables the researcher to build theory, first recognising the problem that should be resolved, secondly finding out ways to improve the current situation, and lastly confirming that the suggested methodology is the key to success and will truly resolve the research problem. The positivist case study research assumes studying the cases as units of analysis with use of "the criteria for interpreting the findings" in a way that enables "logic linking the data to the propositions" and is what helps to match the collected pieces of information (Yin, 2009) and to develop/build theory.

Building theory from the case studies

The combined grounded theory and case study process is consistent with investigations consisting of systematic data collection gathered by using semi-structured, in-depth interviews and participant observation together with analysis of unpublished documents, reports, memos, letters, e-mail messages and so forth, which are approaches and sources associated with methodology chosen. Conceptual construction and finding mutual connections and interdependence leads to building a conceptual framework, and a set of categories (constituted by the concepts) that enable coding of collected data (Bryant & Charmaz, 2010). The defined concepts should be definitive as they are more appropriate for a study that fits into the framework of positivism epistemology (Åge, 2011). Preliminary concepts can be considered such as the number of successfully finished projects, customer satisfaction and consideration of quality (Płotka, 'in preparation'). Finally, through the integration of conceptual categories built from concepts, and on a framework around the core category, (Bryant & Charmaz, 2010) will result in the development of theory. These elements form the basis to formulate the methodology needed to achieve the aims of the investigation.

3.2 'Glaserian' and 'Straussian' point of view

Although, based on theory building, a grounded theory enquiry originally proposed by Glaser and Strauss (1967) is a kind of theory-testing (inductive orientation) research which recommends beginning the study without any theory, hypotheses, or preconceived ideas (Hallberg, 2006) Strauss in his later works permits the researcher to start work "having general idea of where to begin" (Halaweh, 2008; Onions, 2006) thus he came closer to inductive-deductive methods. However, Glaser's perception of survey conduction remains rigorously positivistic. As there were some pre-ideas based on experience from professional work within IT, only the Straussian approach was available. However, a positivist Glaserian stance gives the chance for preserving the objective character of the research. The above discussion shows that the decision about which is the most appropriate approach is a difficult one to make. Therefore conducting a study taking into account elements of both of them is strongly considered.

4. Conclusion

To sum up, one of the primary aims of the proposed research is in-depth analysis of problems with inadequately addressing stakeholders' interests in work on IT projects. Once the problem is described it will be necessary to find out a way to solve it. For this purpose we will modify stakeholders' and task identification in SoDIS analysis taking into account methods that interface between subjective clients' needs and the demand for 'objectivity' to fit with software development models. The extension of existing quality models (such as ISO 9126) providing these characteristics are strongly considered. All proposed changes should lead to an enhanced software requirements engineering

process in order to solve problems such as ‘gaps’ and ‘overlaps’ as described in the course of this paper. A methodology to achieve the research aims will be built from the positivist case study design.

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WORKING ETHICALLY IN PARTICIPATORY RESEARCH WITH CHILDREN

Janet C. Read, Peggy Gregory, Gavin Sim and Matthew Horton

Abstract
In this paper we present the ABCD framework for working ethically with children and young people in participatory design studies. This framework covers A – Agreement and consent made between all participants and interested parties; B – Behaviour of the research team towards the activities, requiring them to examine their motivations and to be honest in their interactions with children; C – Classroom experience in participatory sessions during which children are encouraged to discuss the nature of their participation, and D – Dissemination of the work and planning appropriate follow on activities to ensure that children are informed about the outputs from their contributions. We discuss the process by which we developed the framework, the challenges raised by working in this way with children and the role of values in participatory research.

Keywords
Ethics, Children, Participatory Design.

1. Introduction

The ChiCi group has been designing and evaluating technologies with children for about ten years, and our work has gradually evolved over time. In this paper we discuss our approach to establishing ethical ways of working with children when we use them as participants in our research, and we highlight some of the problems that emerge when we work with children in this way.

In the early days our work mainly involved collecting data from children as they tested technology (Read 2005). In these early studies our ethical concerns focused on the gathering and storing of personal data, the use of photographs, the use of logging equipment and the way in which we managed inclusion and informed consent. At the time most of these challenges were perceived to be covered by University ethical guidelines, although with hindsight this supposition seems naïve.

More recently we have started to work more collaboratively with children, doing design work with children and teenagers and longitudinal studies where the team repeatedly goes back to one group for information and confirmation of ideas (Mazzone, Read et al. 2008; Read, Fitton et al. 2011). This work has led us to question how children are 'used' in these studies, and resulted in us challenging some of our practices. Emerging from a funded project in which the group took the lead on design events across several countries, and during which the team started to challenge some of its own practices, an effort was made to clarify and formalise appropriate approaches and methods for ethical working with children. Our aim was to develop an ethos of being honest with the children with whom we were working in order to better ensure that at all times we were doing ethically sound work. Procedures that we developed have not been driven solely by a desire to get 'university ethical clearance' but specifically by a desire to do what is right.

2. The ABCD Framework

Our approach to working ethically with children has evolved, and several iterations of method improvement have taken place (Read and Fredrikson 2011); culminating in the development of the ABCD framework. This framework covers A – Agreement and consent; B – Behaviour of the research team towards the activities; C – Classroom experience in participatory sessions, and D – Dissemination of the work.

Agreement and consent is a fundamental part of any ethical framework for working with human participants, and is generally covered by standard University ethical procedures. Many of the studies undertaken by the ChiCi group are run in schools or during MESS Days (Read 2011), and in both cases we work with whole classes of children (Mazzone, Tikkanen et al. 2012). MESS Days are events held in our labs at the university to which a class of school children are invited, accompanied by their teachers, to do a series of fun research activities. MESS days typically involve a series of evaluation and participatory design sessions running simultaneously in different labs. Classes are split into smallish groups and each group gets an opportunity to try out a number of activities. We have found this is a useful way for us to provide children with a fun and varied experience, and at the same time for us to be able to gather research data for a number of studies. When preparing for our research events we provide information about our studies and gain consent from class teachers and parents. However, we have also developed a practice whereby we explain our research objectives and obtain consent from children while we are working with them in the classroom. This involves ensuring that we set time aside to briefly explain to children what a University is, what research is, and how the work they are doing will feed into our research outputs. As we work with children from a range of age groups from the ages of 6 to 16 we have to adapt our explanations considerably depending on the age of the group we are working with.

Behaviour of the research team during research activities covers preparing for research days. We have developed a series of materials to guide and help researchers when they are working with children (www.chici.org/index.php/resources). These materials are useful as every year new postgraduate students and members of staff join the team so there is an ongoing need for training. Some of this material covers basic rules for interacting with children, such as not taking photos without parental permission, and not to be alone in a room with a child. It also includes tips about how to plan activities that are fun and inclusive for all the children in the group, such as always being encouraging towards the children, making sure they know it is the technology that is being tested and not the child, and that they cannot 'fail' at an activity. These guidelines help researchers to improve the planning of their activities, even if they do not yet have much experience of doing research with children. Additionally, this stage requires the research team to examine their own motivations before carrying out the work, and to commit to explain the project and their motivations to the children in an appropriate way, to be honest when questioned and honest when writing up research.

Classroom behaviour is about the atmosphere created for participating children when we work with them in the classroom or lab. This follows on from the previous preparation activities that the researchers have undertaken. This stage is about ensuring that we create a positive and enjoyable environment when we work with children. We firmly believe that when we ask children to take part in our research activities, even if we are using experimental methods, that their experience should be fun and that all members of a class should be able to take part. As part of this remit we ensure that we explain ourselves clearly, that we make time to have a dialogue with children before and after activities, that we listen to the views expressed by the children, and that children's ideas are equally considered. We also ensure that all children are facilitated to participate and understand that we value their participation in the events that we have planned, but that they may choose not to take part in activities if they so wish.

Dissemination is about ensuring that we plan appropriate follow-on activities with groups of children to keep them informed about the outputs we have produced from their contributions. Feedback is often given to adults who participate in research projects, but is rarely given to children. We believe that when children's participation in a research project is at a high level, we should use 'ethical symmetry' and treat children in the same way as we would adults (Christensen and Prout 2002). For example we are committed to showing children software that has been developed as a result of their participation, as well posters and journal papers and summarising to them, in appropriate language, the main findings of our studies and providing news letters to schools detailing the outputs of our research.

3. Values in Participatory Design with Children

Our concerns can be positioned alongside those of others working with technology-related value sensitive design and participatory design (Iversen, Halskov et al. 2010; Yarosh, Radu et al. 2011). These approaches treat ICT as constitutive technology which shapes human life and hence consider IT design to be a value-laden activity (van den Hoven 2006).

Participatory design was developed in Scandinavia in the 1970's and 1980's and embeds democratic values by working directly with stakeholder groups (Bodker, Ehn et al. 2000). From these emancipatory theoretical foundations it advocates that stakeholders should explicitly influence values, norms and ethical considerations that are embedded into designed artefacts. At root participatory design is a form of collaborative working by which groups of users can influence design decisions. However these days much ICT development produces generic software with wide user bases, so it is more practical to work with user representatives than with whole user groups. Another feature of software development is that there is a need for both technical and end-user design, and these are inter-related. Hence when planning design processes we need to consider how these designers may best work together. With this is mind, in the ChiCI group we have explored different models of participatory design sessions in which design experts (software designers and researchers) work with domain experts (the end-users, children) to produce designs. We have envisaged the amount of input end-users contribute to a design as a continuum along which there are identifiable, but not discrete, modes. These range from low level contributions (informant design), to a partnership approach (balanced design) to high level contribution (facilitated design) in which the domain expert takes the lead. (Read, Gregory et al. 2002). Although in our early projects we often worked with children as informants, we are now often working with a balanced or facilitated approach. When participants contribute directly to a design, it is important that they understand the nature of the artefact they are contributing to, and are aware why and how they are contributing. Participatory work with children is a way of giving them a voice in the way their technology is designed. We believe that given an appropriate framework, children can become very involved in design projects. This approach not only ensures 'usability' and enhanced 'user experience' but also is a way of ensuring the focus of the design is on what is appropriate for children of that age, and is understandable by them.

Value sensitive design is a way of making values part of technical design, research and development, and provides a useful perspective on our work. Value sensitive design emerged in the early 1990s from the work of Batya Friedman and Peter Kahn (Friedman and Kahn 1992; Friedman 1996), and it attempts to deliberately incorporate principled values into design processes. The basis of the approach is that values are inevitably incorporated into design and as a result technical artefacts that are designed without a consideration of values often exhibit pre-existing biases. These biases reflect the culture or sub-cultures of the designers and the organisations in which they work. A key technique used by value sensitive design is stakeholder analysis, which is used to build a thorough understanding of both direct and indirect stakeholders. Participatory design is also a technique that can be used to achieve this. This is particularly pertinent when designing with children, as their world is far removed from the work of technical software production. Our work in ensuring we have a dialogue with children during participatory design sessions is a starting point for considering values in design.

4. Discussion

Central to our approach is the need to identify and critically examine the values we enact in our research. In our early work many of the ethical conversations we had were somewhat ad hoc. In our recent work we have attempted to formalise some procedures, so that we can more easily reproduce good practice. However, within these boundaries, the nature of the ethical discourse and decisions that are made are not a foregone conclusion, but are dependent on team members engaging in ethical discussions about the project in hand. For each project the ethical decisions that are made will depend on the project context, the participants and the technology being developed.

This work has uncovered some particular difficulties and contradictions that arise when doing participatory design with children. These include finding effective ways of explaining our work in

language that young people will understand, unpicking different aspects of our intentions, finding effective ways of enabling children to make real choices about what happens to their ideas, being transparent about the process of eliciting design ideas, being fair when choosing which designs to implement, finding understandable ways of explaining research outcomes to children.

Sometimes we have found that compromises are necessary. For example, one of our aims has been to ensure that we explain the nature of our research before we start a design activity. However, when working with children, particularly younger groups, we find that our sessions are time-limited by a number of factors including the children's attention span. Whereas a group of adults may need only a few sentences of introduction to a research project, most young children need a lot more explanation in order to understand what a University-led research project is. With limited time slots we need to make sure that we leave enough time for the children to do the design activities, so the amount of time available to explain our work can be restricted.

In terms of communicating the purpose and practicalities of research to children and allowing them to consent in 'as informed a manner as possible' we feel that we have made some advances. For a recent study we developed checklists (Read, Horton et al. 2013) to assist us to ensure we have the relevant information at hand when we talk to children and we have produced a set of work booklets for children, designed for three age groups, that better explain the terms 'research' and 'university'. In the same study we found that teachers and teaching assistants were pleased that we explained 'scientific ideas' to the children, and they suggested that for the younger children in particular 'seeing' the tangible outputs from their participation would help to make sense of the process, as the concept of consent and idea release are possibly a bit difficult for them to understand.

We acknowledge the many drivers that motivate our work. We therefore need to honestly question the purpose and appropriateness of what we do both from a research perspective and from an ethical perspective. As well as considering how we explain projects to children, we also ask a range of other questions when we commence a study such as: whether the technology we are building is appropriate, what range of motivations we have for the project, to what extent children can sensibly inform the design of such technology, how can we devise a fair method to use and include children's ideas, how do we honestly explain projects to children and help them to understand their role in the process. When we ask these questions we acknowledge that as well as being interested in design engaging, fun and educational technology with children, other factors come into play. For instance we often use certain technologies because they are readily available, we may run a study because we want to publish a paper in a particular journal, and we choose certain activities because they showcase the work of our group. These are the realities of research constraints for all researchers, but we believe that it is important to acknowledge them.

One aspect that has not yet been clarified is transparency in the process of eliciting design ideas from children. This remains an area where more needs to be done. Our group believes it would be beneficial to be able to tag idea development and are working methods for doing this. The aim would be to be able to identify key significant contributors to a final product. Whilst it is true that ideas developed using participatory design procedures cannot be copyrighted they can at least be attributed.

5. Conclusions

We have presented the ABCD framework for working ethically with children in participatory research, and explained how and why it has been developed over time in our work with children. Also, we have discussed how our approach links to the traditions of participatory design and value sensitive design, and explored some of the tensions and difficulties we experienced as we tried to develop our approach. Our work continues, and future work aims to improve the clarity of our dialogue with children.

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DIGITAL DISABILITY DIVIDE IN INFORMATION SOCIETY: THE CASE OF IMPAIRMENTS

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Abstract
In this paper, we study one part of digital divide which is digital disability divide. Digital disability divide exists between people with impairments and those without impairments, because multiple studies have shown that people with impairments less often own a computer or an internet connection than people without impairments. However, digital disability divide is not only about access but also about accessibility and use. For people with impairments, new technological innovations offer a solution for every day challenges such as finding information, communicating with other people and using electronic services. Our goal for this paper is to create a conceptual framework for analysing digital disability divide and for helping to find solutions for it.

Keywords
Disability Divide, Digital Divide, People with Impairments, Assistive Technology, Functional Blindness, Physical impairment, Cognitive impairment

1. Introduction

Digital divide is a multidimensional and complex phenomenon which exists within and between countries (Bertot, 2003). Early research on digital divide concentrated on the technological dimensions (DiMaggio & Hargittai, 2006). In particular, studies have been conducted to track user access to internet and computers; either in private homes or in community access points such as work places, schools and libraries (Kaye, 2000; Dobransky & Hargittai, 2006). Over time, the criticism toward technically biased research on digital divide has generated multiple streams of research in this field. These streams include studies on economic, information accessibility and information literacy dimensions of the digital divide (Bertot, 2003; Hawkins, 2005).

Within national context, the digital divide is noticeable between people with different financial (Wei & Hindman, 2011), educational (Lengsfeld, 2011) or racial status (Hoffman & Novak, 1998; Fairlie, 2004). This gap also exists between people with impairments and those without impairments. Although, some researchers (Dobransky & Hargittai, 2006) refer to this gap as disability divide, we decided to use the term digital disability divide for this paper because it clarifies that the gap is studied in the context of information and communication technologies. Similar to digital divide, digital disability divide can be studied in both in national and international contexts (Borg; Lindström; & Larsson, 2011) and it has multiple dimensions, such as access, accessibility, and use (Dobransky & Hargittai, 2006).

Multiple studies on the access to ICT (e.g. Kaye, 2000; Dobransky & Hargittai, 2006; Hollier, 2007) have revealed that people with impairments are less likely to own a computer or an internet access at home than people without impairments, which can be associated with their socio-economic status. Accordingly, people with impairments use internet less often than people without impairments, even if the comparison is made between people who have a computer and an internet access at home (Kaye, 2000; Dobransky & Hargittai, 2006). The gap is even greater when comparison is drawn between people who do not have a computer or an internet access at home, and thus have to access it in community access points.

According to Dobransky & Hargittai (2006), there are multiple online activities that people with impairments are less likely to engage in, when compared to people without impairments. For example, impaired citizens are less likely to use internet for communicating with others, making purchases, looking for particular service, using bank online or searching for jobs. On the other hand, they are

more likely to play games, and as can be expected they are more likely to look for health related information and search for information on Government organizations online.

People with impairments are not a homogeneous group and they face different kind of barriers according to their type of impairment, economic situation and social background. Impairment is independently related to the lack of using Internet in the case of people, who are visually impaired or who have difficulties in typing (Dobransky & Hargittai, 2006). Functionally blind people have trouble reading scanned documents and graphics on the computer, even with state-of-the-art screen readers (Lazar et al. 2007). Difficulty in typing can be related to different kind of disabilities such as cognitive impairments or motoric impairments. For example, cognitive impairment can affect person's ability to acknowledge letters and thus, prevent writing with a keyboard (Friedman & Bryen, 2007).

In the case of functional blindness or cognitive impairment, a person might need specific tools to use computers and other technological devices, these tools that are referred to as assistive technology. Assistive technology can also include computers, as long as the computers aid a person with impairment to accomplish a task or acquire information that could not have been accomplished without the help of another person or a tool. The possibility to access assistive technology is related to person's financial standing point; thus, there is gap in-between person with impairment depending on their economic situation. However, the importance of financial barriers is sometimes reduced by certain states, which offer offering financial support for their citizens who need assistive technology.

Technology adoption in the case of impaired citizens is the first step towards bridging the disability divide. Continued usage can be promoted once a clear understanding of factors governing continued usage of assistive technologies has been established. People with disabilities rely on assistive technologies to carry out daily tasks, so even minor modifications in the form of technology re-construction or delivery can make continued usage difficult (Philips & Zhao, 1993). In recent times, especially through the use of social networks, technology has evolved to become more interactive (Birchmeier, Dietz-Uhler, & Stasser, 2001), yet impaired citizens have struggled with this change, which for them is a hindering instead of an aiding factor (Johnson & Moxon, 1998).

The purpose of this paper is to define digital disability divide and present a concept for studying its importance to people with impairments. This paper focuses on the digital disability divide among physically impaired as well as cognitively impaired people in the context of information societies, such as Finland, although the preliminary empirical study is conducted only among the physically impaired. Our research question is: How do people with physical or cognitive impairment perceive the existence and the consequences of the digital disability divide in their life? To answer this question, we analyse relevant academic literature concerning digital divide. In addition, we have conducted preliminary empirical study related to the topic which concentrates on the problems that people with functional blindness face when using ICT. According to Sachdeva (2012) people with functional blindness often face problems in using ICT. Our preliminary empirical study includes interviews of of functionally blind Finnish people and interviews of Finnish professionals who provide services to the people with functional blindness. In future, the research will be expanded by conducting interviews among people with cognitive impairment such as autism spectrum disorder.

2. Preliminary Empirical Study

This paper is premised on the interviews that were conducted by both authors. In the context of digital disability divide – as discussed in this paper – 9 people have been interviewed. A total of 13 interviews were conducted, each lasting between 30 and 90 minutes. The primary purpose of these interviews was to gain an understanding of digital disability divide in the context of blind. The interviews were semi-structured and the authors prepared a list of questions which focused on the core issues surrounding digital disability divide.

The interview participants included 7 people with impairments, as well as 2 people who are responsible for social rehabilitation of these people. The authors felt necessary to understand the impact of public policies and social incentives in the lives of these people (people with disabilities), thus it became important to speak with caregivers and those that can affect policies and decisions.

In these interviews, the following issues were addressed: attitude towards assistive technology use, actual assistive technology use, differences between dependence on assistive technology and personal assistance, need for better technology accessibility. In the interviews with caregivers and policymakers the addressed issues included their role and impact in affecting rehabilitation programs for people with disabilities.

3. Concept for Digital Disability Divide

Digital divide can have a negative effect on people who suffer from the consequences of lack of technology availability, accessibility and usability. While it is not originally intended to make technology unusable for some segments of the population; unintentionally, technology developers and manufacturers create mass-produced technology with only the able users in mind. This flawed designing process alienates smaller segment of users – including people with disabilities. It has often been suggested that disabled users should be part of the technology designing process, which would allow these technologies to be usable by everyone. With respect to technology, lack of these measures, amongst others, results in a large divide between able and disabled people – a divide which has been referred to as digital disability divide. It is important to understand the framework within which digital disability divide impacts impaired citizens. As shown in Figure 1, the digital disability divide framework centres on four pillars, which are social, technical, financial and motivational.

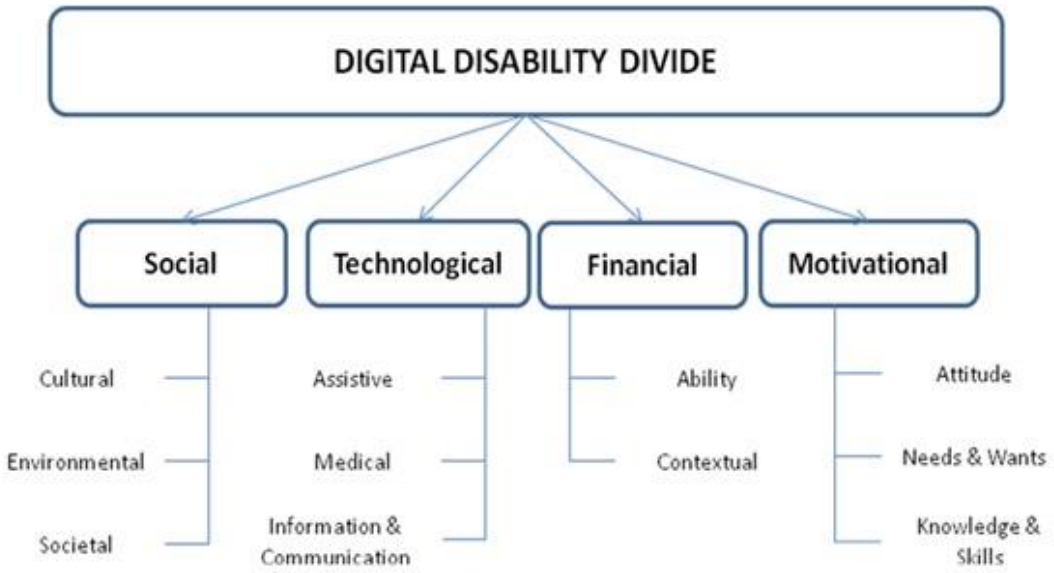

Figure 1. Our framework for Digital Disability Divide

3.1 Social

Impaired people are affected by everyday social mechanisms in a variety of ways (Abberley, 1987; Goodley, 2001; Shakespeare, 2002). Rapid growth in population results in imbalance of opportunities (Holdren & Ehrlich, 1971). This is reflected in all walks of society, including schools, workplaces, and playgrounds. This imbalance leads to inequalities in technology availability – as can be seen in the case of web technology (Adam & Kreps, 2006). This digital disability divide further worsens the social aspects of living conditions for impaired citizens. Based on our interviews of impaired citizens and complimentary research, we have found three main social factors that affect digital disability divide: cultural, environmental and societal.

Cultural

It is highly unlikely that people living in two different locations would have similar opportunities, or same behaviour. For example, developing and developed countries show different attitudes towards incentives and treatment made available to disabled people (WHO, 2012).

Environmental

Often, impaired people have to deal with vagaries of environment that are outside their control (Steinfeld & Danford, 1999; Wahl, Fänge, Oswald, Gitlin, & Iwarsson, 2009; White et al., 2010). These environmental factors could inhibit technology adoption or use, thus amplifying presence of digital disability divide.

Societal

Society is a big part of our overall social construct. A well-formed society allows increased participation to those that are interested. However, lack of societal incentives for better inclusion of disabled people could aggravate digital disability divide. Better societal rehabilitation opportunities can help reduce this digital divide (Imrie, 1997). Furthermore, Imrie (1997) has also lamented the attribution of disability to an individual's problem, rather than the problem of the society and environment in which the individual resides.

3.2 Technological

The primary component of digital living is technology, and thus, it is also an important factor in the digital disability divide framework. While many forms of technologies are easily available; complications in their accessibility and use are problematic. Impaired citizens often find that technology needs to be personalized and customized to suit their needs (Hurst & Tobias, 2011). Both assistive and recreational technologies are useful in managing daily tasks. Within this framework, we have covered both, due to their applicability and generalizability.

Assistive Technology

Hersh (2007) has defined the role of assistive technology in terms of social model as "overcoming the gap between what disabled people want to do and what the existing social infrastructure allows them to do". According to Hersh (2007), assistive technology can be used to overcome the social, infrastructure and other barriers experienced by disabled people that prevent their full and equal participation in all aspects of society. Similarly, Carr, Gibson and Robinson (2001) have pointed out that assistive technology allows people to continue in their normal roles and meet their expectations of life despite their physical impairment and disability.

People, who we interviewed, agreed that screen readers and braille printers are examples of assistive technologies. However, they often raised the question whether laptops also represent assistive technologies.

Medical Technology

Medical technologies include the devices, drugs, and medical procedures used in medical care, and the organizational systems within which such care is offered (Behney, 1989 in Timmermans & Berg, 2003). While medical technology is not necessarily usable by impaired people, its applications allow in reducing digital disability divide that exists in our society. Availability of proactive medical technology allows treatment of people with disabilities, enabling them to function outside of hospitals and other medical settings. Some of the more common medical technologies include artificial limbs, pacemakers, X-ray machines, surgical instruments etc.

Information and Communication Technology

In addition to assistive technology, people with impairments can also use different forms of technology. For our frameworks, the most essential of these technologies are information and communication technologies. For example, social media platforms offer different kinds of venues of communication for the people with impairments, which often proves to be highly beneficial (Spence, Lachlan, Burke & Seeger, 2007).

3.3 Financial

Lack of finances can seriously affect purchasing power for people who wish to use technical devices. As adults, disabled people have restricted employment (Yeo & Moore, 2003), which can have serious impact on their financial situation. Government aids and incentives could help lessen this impact

(Argyrous & Neale, 2003), though sometimes that might not be the case (Verick, 2004). Lack of money could mean that impaired people are unable to spend money on assistive or medical technology, thus increasing the scope and impact of digital disability divide. An individual's financial status is affected by two main factors: his or hers personal ability and contextual factors.

Ability

Depending on the nature of the impairment and its impact on an individual's work opportunities, the financial ability could be severely limited. In our interviews, we found out that lack of money can prevent a person from acquiring the certain type of assistive technology that he or she would need. Lacking this technology can prevent him or her accessing the internet or using the computer. Thus, the lack of money for the assistive technology can amplify the negative aspects of digital disability divide.

Contextual

Measures such as financial incentives from the government can enable impaired people to access to assistive and medical technology. These measures, as well as specialist training can be commonly found in developed countries (Thornton & Lunt, 1997). An individual's surrounding – both social and environmental – can impact his or her financial status, and by association, impact on the accessibility of assistive technology.

3.4 Motivational

One aspect of digital disability divide, which is perhaps more powerful than any other – is motivation – motivation to adopt and use technology. If an individual does not possess the skill-set required to adequately use technology, and does not have the motivation to change this shortcoming, then the impact of social, technical and financial factors becomes marginal. Instead, motivation of an individual becomes the prime component in affecting digital disability divide. It can be argued that a combination of social, technical and financial factors can affect an individual's motivation. While this might be true, we suggest that the digital disability divide framework should contain an independent motivational element that is based on three aspects that form the core of individual's motivation: attitude, needs and wants, and knowledge and skills.

Attitude

An individual's attitude determines the response type to difficult situations. For most part, attitude is shaped by one's object, situation and personality (Sun, 2009; Maio & Haddock, 2010), yet it can be changed throughout a lifetime. Strong will and positive attitude has been found to improve technology usability (Bhattacherjee & Premkumar, 2004). On the other hand, impaired people who are unwilling to depend on assistive technology might resist it due to negative attitude towards technology.

Needs and Wants

People base many decisions on their needs and wants, which includes decisions such as whether or not to use technology. Maslow's hierarchy of needs details 5 levels of human needs, which serve a variety of purposes (Maslow, 1943). One of our interviewees told that a person, who has recently got impaired, first concentrates on learning new skills which he or she needs for fulfilling his or her basic needs such as hunger, thirst, or feeling cold. Thus, learning to use new technologies or new skills for using technology is not his or her priority, except if using these technologies is vital for fulfilling his or hers basic needs.

Knowledge and Skills

Knowledge and skills probably play an underlining role in dictating motivation behind technology adoption and use, thus impacting on digital disability divide. Multiple studies about adults in USA have shown that owning a computer or using internet strongly correlates with person's educational background (NTIA, 2002; Fox & Livingston, 2007). The same appears to apply to people with impairments (Kaye, 2000). However, it is debatable whether education is related to the knowledge and the skills needed for using computers and the internet. For example, Mitra & Rana (2001) found out that no knowledge of English is needed in order to be able to learn complex skills with a computer.

4. Discussion and conclusion

In this paper, we have presented a conceptual framework for digital disability divide. It has four pillars which are social, technological, financial and motivational. Each of these has two to three factors which affect to digital disability divide either in social, organizational, or individual level. Together all these elements converge to clarify the meaning and impact of the digital disability divide.

Overcoming digital disability divide is possible, but policy makers, technology producers, and different kind of citizens should take responsibility for it. Private companies, which design and produce technology, play a major role in improving the quality of life for the people with disabilities. Innovation, personalization and better accessibility could help people with disabilities to better use and accept their devices. Social incentives such as medical and vocational rehabilitation improve possibilities of satisfactory employment.

However, the digital disability divide cannot be bridged if impaired citizens do not want to use technologies. Attitude can be changed when impaired people actively try to engage each other into use of information resources including social media. Opinion leaders (Burt, 1999) are needed among impaired people to advance the use of internet and other resources. It is important to invite personally impaired people to different social forums. Needs and wants are naturally there, as people search for social acceptance, regardless of their health status (Gifford-Smith & Brownell, 2003). Knowledge and skills can be improved through different training methods, including self-learning, peer-to-peer support and different organize learning sessions.

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APPLYING CONTEXTUAL INTEGRITY TO THE CONTEXT OF SOCIAL NETWORKING SITES TRACKING

Rath Kanha Sar and Yeslam Al-Saggaf

Abstract

Behavioural tracking is very common and many studies have shown that a user's online movements can be tracked by various parties including advertisers and data aggregators. The findings of our experiments showed that social network sites (SNS), particularly Facebook, Twitter, LinkedIn and Google Plus, have the ability to not only collect and store large volume of a user's information, but also transfer user's data to third party sites and also track that user's movement within and beyond SNS boundary, particularly among web sites embedding SNS widgets. In this paper, we analysed the privacy issue of online user's tracking by SNS from the perspective of Helen Nissenbaum's Contextual Integrity. Our aim was to answer to the question of whether or not an online user's privacy is violated by such practice.

Keywords

Contextual integrity, Social network sites, information leakages, online privacy, HTTP headers, HTTP cookies

1. Introduction

Social networking sites (SNS) like Facebook, Twitter, LinkedIn, and Google Plus, introduced a new means of communication where online users populate their online profiles with information such as name, date of birth, pictures, contact details, and other posts. Those SNS have become very popular recently. Facebook alone attracted more than one billion active users in mid 2012 (ABCNews, 2012) while Twitter was reported to have every U.S. Senate member signed up for a Twitter account early this year (Leggatt, 2013).

While providing a new means of communication and attracting millions of users, SNS became of great interest to the research community and it has been demonstrated through various studies that SNS leak and share users' information to third party sites such as advertisers and data aggregators, particularly via the HTTP headers (Krishnamurthy & Wills, 2008; Soltani, Canty, Mayo, Thomas, & Hoofnagle, 2009; Krishnamurthy & Wills, 2010a, 2010b; Mayer, 2011; Krishnamurthy & Naryshkin, 2011). Those studies were conducted by investigating large number of sites across many categories. We believe the results of those studies are important for showing the nature of information leakage from SNS and non-SNS to third party sites; however, these studies hardly reflect users' browsing habits in real life because users are not likely to visit large number of either SNS or non-SNS (e.g. 10 SNS) at a time. Instead, users tend to have a combination of online activities such as checking emails, using SNS, reading online news articles, performing online searches and doing online shopping (Purcell, 2011), within some selected sites.

Despite the fact that privacy issues in SNS have caught the attention of research community, research that examines the moral aspects of privacy on the basis of an empirical study is scarce. Answering questions regarding online privacy can be challenging. However, Helen Nissenbaum (Nissenbaum, 2011) suggests that analysing privacy online should be like those about privacy in general because Internet is not a distinctive sphere; rather, our online activities, mediated by Internet, are deeply integrated into our social life, and they are as diverse as our offline activities. She proposes a privacy benchmark known as *Contextual Integrity* (CI) in order to respond to privacy challenges posed by new emerging technologies like Internet.

This work aims to examine privacy issues, particularly those raised by SNS, by analysing the results of an experimental study in light of Nissenbaum's CI. Our experiments demonstrated that SNS, such as Facebook, Twitter, and Google Plus, have the ability not only to disseminate users' information to

third party sites, but also track users' movement across different sites. CI has been used to analyse privacy online in several contexts, for example, in the context of public records online, and the radio frequency identification (RFID) (Nissenbaum, 2004), in the context of data mining (Nissenbaum, 2004; Tavani, 2007), in the context of blogosphere (Grodzinsky & Tavani, 2010), and in the context of cloud computing (Grodzinsky & Tavani, 2011). To our knowledge, there is no study that has employed CI as a framework to analyse the privacy issues from the practice of SNS sharing users' information and tracking users' movements. Therefore, the aim of this study is to find out whether or not such practices by SNS companies violate the norms of information by using CI as a framework.

The paper is organised as follows. Section 2 summaries the findings of our experiments. We provide a brief background and description of CI framework in Section 3. In Section 4, we apply CI's informational norms to the findings and conclude in Section 5.

2. Social networking sites sharing and tracking users' information

We conducted Wireshark experiments aiming to identify the privacy implication of browsing the Internet within several browsing sessions by analysing the HTTP headers resulting from the first author of the article's browsing of various most frequently visited sites.

We first decided on the set of most common browsing activities (such as checking e-mails, doing online shopping, using SNS, performing online searches and reading online news articles (Purcell, 2011)). Then we selected the sites associated with the chosen activities by using the rankings in Alexa (www.alexa.com). In terms of online searching, we relied on the data provided by Google statistics for the frequently searched terms. We analysed the HTTP headers resulting from the browsing activities, and reported on the types of information being shared and to whom.

We found that, within just one browsing session of the selected sites, user's identifiable and non-identifiable information are being leaked or shared from first party sites being SNS and non-SNS to various third party sites, and those pieces of information were also seen to be transferred from third party to other third party sites. For example, when the first author looked up for *vanilla cup cake* recipe on *taste.com.au*, her searched term, *vanilla cup cake*, was seen to be transferred to various third party sites such as *doubleclick.net*, *Facebook*, and *Twitter*.

Our results also show that SNS, especially LinkedIn and Facebook, leaked users' identifiable information (e.g. name and SNS ID) to third party sites, and moreover, Google Plus, Twitter, and Facebook also have the ability to track users' browsing activities not only within but also beyond SNS, particularly among web sites that use SNS widgets (e.g. Google Plus's Plus one button, Facebook's Like button, and Twitter's Tweet button). SNS themselves are now holding not only large amount of personal information provided by SNS users, but also information about users' movement across different sites.

3. Contextual Integrity

While pointing out that "privacy in public ", which has been excluded or ignored in the past, is worthy to be studied and protected in the information age (Nissenbaum, 1997), and that previous philosophical and legal theories of privacy offer limited justification and mechanisms for dealing with the problem of privacy in a non-intimate real or public (Nissenbaum, 1998), Nissenbaum (2004) introduced a privacy framework called *contextual integrity*.

Contextual integrity focuses on the notion of "context "to analyse and evaluate whether or not the information gathering and dissemination is appropriate with the norms within a specific context (Nissenbaum, 2004; Barth, Datta, Mitchelle, & Nissenbaum, 2006; Nissenbaum, 2010). Nissenbaum believes that almost everything we do, act, and interact with others, take place in contexts. By contexts, she refer to "structured social settings with characteristics that have evolved over time (sometimes long periods of time) and are subject to a host of causes and contingencies of purpose, place, culture historical accident, and more "(Nissenbaum, 2010, p. 130).

She also adds that people navigate between different contexts (e.g. education, health care, employment, religion, family, and the commercial marketplace) throughout the day. Each context is characterised by different *roles*, is partly constituted by canonical *activities* that are oriented around *values*, and is governed by behaviour-guiding *norms* that prescribe and proscribe acceptable actions and practices. For example, in the *context* of education, Jane Doe's *role* is a teacher of mathematics in a public university where her job *activities* include giving lectures and marking the assignments and exam papers. The *value* of the education or her *role* as a teacher is to transmit the knowledge to the students. The *norms* at her workplace prescribe that Jane as well as other teachers design the subjects in the curriculum and prepare report cards (Nissenbaum, 2010).

Among the norms present in most contexts are ones that govern the flow of information about people involved in the contexts. Therefore, Nissenbaum (2004) posits two types of informational norms in her privacy scheme: (a) norms of appropriateness and (b) norms of distribution.

Norms of appropriateness dictates the types or nature of information about an individual that is allowable, expected or demanded to be revealed in a particular context. For example, in the context of education, it is appropriate for the admission office to know the students' past grades or GPA before granting them admission to a course of study, but it is not appropriate that they also need to know the students' family or relationship matter.

Meanwhile, *norms of distribution* govern the flow of information from one party to another - whether or not that distribution of information respects contextual norms of information flow. For example, within the health care context in Australia, it is appropriate that a patient discloses a medical condition to her general practitioner (GP) and the GP is expected to keep this piece of information confidential. It is also appropriate that the GP discloses and discusses about her medical condition with a specialist if needed; however, it is not appropriate if the GP emails her medical record to her employer.

In brief, the contextual integrity of the flow of information is maintained when both kinds of norms are respected, otherwise, a breach of privacy occurs.

4. Contextual Integrity and SNS tracking

According to the theory of contextual integrity, it is important to know the context and to identify several variables that are involved in the information flow such as the agents (who is gathering the information, who is analysing it, and who is disseminating it and to whom), the nature of the information, and the relationships among the various parties (Nissenbaum, 2004).

Facebook, Twitter, LinkedIn and Google are the main agents who have the ability to gather information, analyse it, and also disseminate it to various third party sites. The nature of the information is both identifiable (for example, LinkedIn user's name transferred to third party site like *b.scorecardresearch*) and non-identifiable information (for example, user's browsings in *taste.com.au* transferred to Facebook). Those SNS provide communication services to users, but at the same time, disseminate different pieces of information to the other agents like the advertisers and the third party application (e.g. Farmvile game application). In addition, they also have the ability to track users' movements outside the SNS. This is in addition to the fact that they already hold large amounts of personal information given by users. Does this mean SNS violate users' privacy?

In order to analyse the concerns of privacy online, Nissenbaum also proposes two recommendations derived from the contextual integrity framework (Nissenbaum, 2011). According to her, we need to locate the context online and explicate the information norms from that context. First, in an online activity, one should look for the similarity to social activities and structures. By locating the similarity, the norms or restraints on the flow of information can be drawn out. Second, without having a need to look for the comparison of online activity to the real life, she suggests that we can work out the norms by looking at the ends, purposes and values of the site or organisation. For example, when we make a bank transaction over the phone, or face-to-face with a bank teller, or online, there is a common expectation that the transaction should be done in a confidential and secure manner.

Unlike other contexts like the online bookstore, or the online pharmacy, SNS is a unique phenomena, and it is not easy to think of a comparable real life context. Looking at SNS structure, we observe that

SNS consists of multiple profiles, and each SNS profile usually comprises of different features such as profile information, wall post, album pictures, private message, and advertisement banners. Every post or activity on SNS profiles are recorded and are retrievable. The notion of a community appears to be a useful term given an SNS community has private spaces (profiles) like houses in a real community.

Let us compare an SNS profile (e.g. Facebook, Twitter, LinkedIn and Google Plus profile) to a house in a community. The process of one signing up for an SNS account and getting an SNS profile is similar to a process of one buying a house within a community. Each house comprises of different features and rooms or sections; for example, a living room area where user can hang out and interact with her friends, or her friends can leave her messages at the door when she is not present in the house, photo albums, and a mailbox where one can drop a private message to the house owner.

Making one's SNS profile private is similar to user using the key to lock up the house to limit access from public or random people. A public profile is like an unlocked house where anyone can just walk in. If the community owner provides different level of privacy setting, user has the ability to provide a different level of access to different people they befriend with.

This comparison shows that an SNS profile can be considered as private as a house where it is governed by some norms; for example, permission is needed to get into one's house. Within a community, it is appropriate that the community's mayor conducts census to get the information about the size of the population, what they do and how they live. The census data is very useful and necessary for a community leader to make informed decisions, and to support planning, administration and policy development. The census is also governed by its norms. For example, it is clearly stated in the Australian Bureau of Statistics (ABS) that any piece of identifiable information in the census data is removed and the personal information provided is kept strictly secured and confidential and is not released to other party outside ABS (ABS, 2012).

However, SNS community in this case is like a small village (place) where everyone within a community can know as much as they want about everyone else. The cookies (from both SNS and non-SNS) resided in a user's computer are seen to be like many spies who would follow each resident in every step they take - either within or outside the community (e.g. to a supermarket, or a bookstore). The information gathering by the SNS goes beyond the census norms because SNS not only collect information about user (both within and outside the community boundary), but also share user's information to third party sites.

According to the norms of appropriateness, it is appropriate that SNS community collect information about its own residents within the community, but it is not appropriate that they also collect information about the residents' movements outside the community (e.g. Facebook is able to know that users visit *taste.com.au* via Facebook's Like button). In addition, according to the norms of distribution, it is not appropriate that SNS community owner shares users' information, especially identifiable information, to third party organisation (e.g. LinkedIn user's name is shared to *b.scorecardresearch*). Applying Nissenbaum's contextual integrity to the context of SNS in this case study allows us to see that both norms are breached, thus, leads us to conclude that user's privacy is being violated by SNS.

5. Conclusion

The results of our experiments reveal that a user's visit to both SNS and non-SNS results in multiple HTTP requests to fetch different contents for the requested pages. Those HTTP requests are seen to distribute user's information within them, including identifiable and non-identifiable information, to third party sites.

In this study, the results of our experiment showed that SNS, like Facebook, LinkedIn, Twitter, and Google Plus, have the ability not only to collect and analyse users' information, but also record users' browsing activities across different sites, especially those who embedded SNS widgets (e.g. Facebook's Like button).

By using Nissenbaum's contextual integrity and by looking for the context and the variables involved in the information flow, it is clear that SNS like Facebook, LinkedIn, Twitter, and Google Plus are the main agents who have the ability to gather, analyse, disseminate users' information to third party sites.

In addition, the comparison of SNS to a real life community, specifically a profile to a house, helps us identify some norms which may govern the community and the data collection within that community context. According to the norms of appropriateness, it is appropriate that SNS collect information about their users within the site, but it is not appropriate that they also collect information about their users outside the SNS boundary. Meanwhile, according to the norms of distribution, it is appropriate that SNS use information collected to assist in maintaining the site traffic and performance, and improve users' experiences in SNS, but it is not appropriate that they also share these types of information with third party organisations. The analysis based on contextual integrity allows us to see that both norms are breached, thus, leads us to the conclusion that users' privacy is being violated by SNS.

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NEW TECHNOLOGIES AND OLD CULTURES: HOW ICT IS SHAPING AND GETTING SHAPED BY THE INDIAN SOCIETY?

Raghubir Sharan, Mahesh Mehendale and Abhay Karandikar

Abstract

Twentieth century has become a momentous century for India due to an important event that took place in 1947. This event is attainment of political freedom after centuries of subjugation. The post independence era has seen, as expected, a push and pull between good and bad with good getting an edge, howsoever so slight, over bad. Justification for this statement comes from survival, though with many flaws, of democracy for six decades. A fruit of this democracy has been a quick and efficient latching on to Information Age and Information and Communications Technology (ICT) which have been ushered by the Western culture. These new tools of information and communication are helping in eradication of some traditional flaws in the Indian society and thereby strengthening democracy. But this is not happening to the desired level because simultaneously vices like corporate greed are also creeping in which are weakening democracy. These are complex issues which involve interaction of culture and technology. A limited view of only some beneficial utilization of ICT for eradication of poverty and strengthening of democracy is presented in this paper.

1. Introduction

The way Information and Communications Technology (ICT) appeared in the western countries is very different from the way it has appeared in India. In the west, it is the present day culmination of a long process of new technology being built on previous technologies. During this process, succeeding technologies generally brought incremental differences and there was ample time available for equilibrium to be reached between technology and values cherished by the society. In India, ICT has appeared not through any organic growth but only through market forces. Hence there is a danger that ICT, in its new Indian environment, may do more harm than good if it is not realized that good use of technology is dependent on culture in which it has to operate. On the other hand, ICT can also do immense good if it assimilates values from the rich time tested culture of India and gets transformed in a way that it can serve the underprivileged of the world. This paper is an exploration in that direction and draws heavily on thoughts of Mahatma Gandhi[1], Baba Saheb Ambedkar[2], Amartya Sen[3], Norbert Wiener[4], Bynum[5] and several others. Particularly, the recent emphasis of Sen [4] (and earlier

[1]Mahatma Gandhi was a prominent leader of the Indian struggle for freedom. He is well known as an apostle of non-violence and an advocate of austere living. His collected writings have been published, as open source, by Government of India and are available at [1]. Several other books on Gandhi and his work have also appeared. The one relevant in the present context is the book by Anthony Parel [2]. This book builds on Hind Swaraj which is a seminal publication by Gandhi written in 1908/09.

[2] Baba Saheb Ambedkar is another very prominent intellectual leader of the Indian freedom struggle. He espoused the cause of the downtrodden section (named 'Dalits' by him). The literature on and by Ambedkar is not as voluminous as on Gandhi but this is also quite vast. An essence of his concerns can be gained through a collection of three speeches and one essay recently [3].

[3] Amartya Sen is a Nobel laureate of Economics . He is well known for advocacy of welfare economics and democratic method of governance. He was invited to address the Indian parliament in August 2008. Recently his book, Idea of Justice [4], has appeared which suggests novel ways for nascent democracies to establish just societies.

emphasis of Wiener [5]) on creating a democracy which is capable of removing the visible as well as hidden pockets of injustice (increasing entropy) has been emphasized. This is done in the next section by expanding the scope of "computer and Information ethics" [6]. Section 3 is concerned with the characteristics of technological education in India. The subsequent sections consider some conventional and some novel uses of ICT. The paper is then concluded.

2. Six decades of Democracy in India

India obtained political independence in 1947. This momentous event thus divides the 20th century for India in two parts: the first five decades of struggle for political freedom and the next five decades used for consolidation of this freedom. Now the 21st century has dawned. But the task of consolidation of freedom (using democratic processes) is not yet complete and much work remains to be done. An insight into why this consolidation is taking so long can be gained by revisiting two great (internal) debates that dominated the Indian thinking in the first half of the 20th century. The first was the Gandhi-Ambedkar debate which concerned the right way to achieve the welfare of Dalits [6] (downtrodden and underprivileged sections in the Indian society). The second was the Gandhi-Nehru [7] debate which concerned whether to follow the "British Ways" [7] (a euphemism for Western culture and thinking) or not after independence.

Let us take the Gandhi-Ambedkar debate first because of its larger significance. Simply stated, both Gandhi and Ambedkar were concerned about setting up a just society where A does not exploit B and also B does not exploit A. Then they, both, noticed that existing caste system in Hindu society was such that the Dalits (B) were being exploited and humiliated by upper castes (A). Both Gandhi and Ambedkar sincerely and genuinely wanted to peacefully change this situation. Gandhi focused on A and wanted to improve the moral calibre of A to the extent that the exploitation ends. Ambedkar maintained that this will never happen. 'A' would go through all the promises but will continue the old habits of exploitation through subtle deceit. He wanted to create a level playing field for B by ensuring constitutional safeguards and reservations in a democracy based on principle of 'one person one vote'. Ambedkar played a very responsible role in creation of those constitutional safeguards that have helped the survival of Indian democracy in the turbulent post independence era. In the early years, muscle power started depriving the Dalits of their voting rights. But in the decade of 1990s ICT came as help in the form of specially designed Electronic Voting Machines. These EVMs have considerably reduced the role of booth grabbing by muscle power and thus provided opportunity to Dalits and other underprivileged sections of society to express their opinion and help in election of their candidates [8]. At the present, considerable effort is also going in using most modern ICT for developing Unique Identification (Aadhar) [9] to check the leakage of welfare money provided by the government. But the most heartening is the recent formation of 'Dalit Indian Chamber of Commerce and Industry (DICCI)' which is result of use of native entrepreneurship [10]. These points would be further elaborated in Section 5 on novel uses of ICT in India.

Let us now take up the Gandhi-Nehru debate that took place in 1945 through exchange of letters [2]. This was again about A and B. But this time A was the colonizing British and B was the colonized Indians. Nehru, who was going to be the first prime minister of independent India wanted to lean, post-independence, on 'British Ways' of development through science and technology. He thought that the "British ways" were the only way to raise the masses from extreme poverty and deprivation. Gandhi, on the other hand, argued that in this way though some prosperity would come, the moral force may become weak. This may happen to the extent that, in time, Indians may not hesitate to

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[4] Norbert Wiener is a well known American Philosopher, mathematician and engineer. He is considered to be one of the founders of the Information age who was also seriously concerned with ethical issues that would arise in the Information Age. He has raised these issues in the book [5].

[5] Ted Bynum is an American philosopher who, with Simon Rogerson of UK, is a founder member of the ETHICOMP conference series. Bynum has emphasized the contribution of Wiener in a paper "Computer and Information Ethics" [6].

colonize and exploit other people for their selfish ends. For Gandhi, a new exploitation by people who were earlier exploited was also equally bad. In fact, effort should be made to remove exploitation in all its forms. This was the Gandhian dream (ethics) which has resurfaced in the 21st century. Importance is now being given to the Idea of Justice [4] where effort is being made to "remove all the pockets of injustice which are remediable". Amartya Sen has lucidly mentioned this in an address to the Indian Parliament in 2008. The question now is this: Is there anything in ICT i) to avoid creation of new pockets of injustice while going through creation of wealth and ii) to remove existing pockets of injustice? An answer to this question can be attempted by looking at the education of the young who have latched on to ICT like fish takes to water. This is done in the next section.

Before concluding this section, it is worthwhile to mention that the existing discourse on Computer and Information Ethics as covered by presentations, say, in ETHICOMP generally attempt to answer question (i). But the real benefit of ICT for underprivileged population of the world would appear if it can tackle question (ii). One way to handle this would be to relook at the following passage from Bynum [6]:

Given Wiener's cybernetic account of human nature and society, it follows that people are fundamentally social beings, and that they can reach their full potential only when they are part of a community of similar beings. Society, therefore, is essential to a good human life. Despotic societies, however, actually stifle human freedom; and indeed they violate all three of the "great principles of justice".

Rather than going into finer points like whether engineering ethics would suffice for information ethics or a new ethics is required, one would have to go to the root and ask what actually ethics is? Only such empathy and engagement would bring answers to question (ii). This is the challenge before the intellectuals engaging with ICT in India and all other places.

3. Characteristics of Technical Education in India

The Gandhi-Nehru debate did not last long in the post-independence era. It ended in increasing adoption of 'British ways' (now being called 'American Ways') and weakening of influence of Gandhian thought on education. Even more important is the fact that only a fragmented part of 'American Ways' and its educational system has been borrowed. One adverse manifestation of this has been a sudden exponential rise in demand for technical and professional education in ICT [7] and substantial decrease in demand for education in philosophy and literature. Departments after departments of philosophy in universities all over the country are withering. Thus there is a danger that culture of critical and original thinking that is enabled by habits of philosophical contemplation would also get weakened. Will it result in a situation where the Indian intellectual, even after attaining political independence, will forever be borrowing from the West as has been the practice in the last six decades? This is a difficult question to answer. Normally, political freedom is followed by economic freedom and this eventually leads to intellectual freedom. Will this intellectual freedom materialise in the first half of the 21st century? Let us engage with this question.

In the West, industry developed in 17th and 18th centuries and this was followed by establishment of regular engineering colleges in the 19th century. In India, in 1947, there was neither industry nor engineering colleges worth the name. It was a difficult situation with existence of extreme poverty and meagre resources. Under these circumstances, whatever decision would have been taken could become open to criticism later. The decision was to encourage technical education and hope that this would spawn entrepreneurship and industry in due course; ironically, this hope is just opposite to what happened in the West. It is very important to note here that, concurrently, some very imaginative effort was also made to establish democratic method of governance. In 1960s, 70s and 80s it appeared that nothing was working and frustration started setting in. But things started changing in 1990s. It is interesting to note that this period coincided with global change from Industrial age to Information age. This created the so called 'story of Bengaluru', a sudden impressive growth of ICT about which a rich literature has started appearing [7], [11]. Be this as it may, it is amply clear that the Indian intellectuals and industrialists are late comers in the area and have not contributed to the original work at the level of Boole, Wiener, Turing and Shannon [12] in forming Information Age. However, they

have admirably latched on to this change. This achievement itself is quite remarkable given the initial conditions that were inherited in 1947. Let us try to understand the strengths and weaknesses of the Indian society which has made this possible. This understanding would also help in looking in a different way at Computer and Information ethics.

Mention has already been made about the caste system in India. The perverse part is the unjust treatment meted out to Dalits which must be corrected. But it has a good aspect also. This is the creation of upper castes which are required to reach 'intellectual heights through pursuit of scholarship' and also 'lead an austere life'. This cultural tradition of, inter alia, emphasis on both scholarship and austerity became the main resource that Gandhi harnessed during the freedom struggle and it also worked to advantage in bringing ICT to India. It has to be emphasized that in Indian culture austerity (frugal living) was considered a virtue and had ethical undertones. It is opposite of consumerism. Gandhi lived a life in 'search of truth' following non-violence and austerity. How austerity and consumerism will be balanced in the Information age is a new ethical question that ICT would face in India.

4. Innovations in Electronics and Semiconductor Design.

Advances in semiconductor technologies (as captured by the Moore's law) have been instrumental in making ICT ubiquitous, influencing the way we live, work, play and communicate with each other. With each technology generation not only the electronic systems have become increasingly affordable, but it has enabled newer applications and markets for the semiconductor electronics. With compute capacity, communication bandwidth and storage capacity getting increasingly affordable, it has opened doors for wide-spread and rapid adoption of ICT in cost sensitive markets such as China and India. While in the 80s and 90s the semiconductor electronics growth was primarily driven by the increasing demand in the West, increasingly it's the Asian markets which are contributing to the growth.

This trend has unique implications in Indian context on two vectors - India as a market for ICT and India as talent pool contributing to the development of ICT. Let's examine both these vectors in detail. Indian consumer's needs are unique. The market is cost competitive, but what Indian consumer wants is value for money and not cheap/low quality things. Thanks to the Internet which has "flattened" the world, the consumer in urban India is well informed and aware of the latest technology and design advancements. He is willing to pay for product features of interest and at the same time not willing to pay for anything he doesn't need. The approach of taking a product designed for the West, cutting down features and selling it cheaper hence does not work. This coupled with the growing size of Indian market now demands products defined and designed for the Indian consumer.

The Indian scenario is unique in multiple ways: a large number of Indian population lives in rural India and has no/poor access to infrastructure including roads, water, electricity and needless to say any kind of voice/data wired connectivity. In 1994, tele-density in India was 0.8 per 100 person against the then world average of 10. In 1994, there were 8 Millions phone lines with a waiting list of 2.5 Millions [13]. In the last decade, cell phones have significantly altered the scenario. As of June 2012, the number of cell phone subscribers is about 934 Millions [13]. It's lot easier to add towers than running wires to each household. India had the advantage of leveraging the technology evolution from the West, and with advances in semiconductor technology it reached a tipping point - where the mobile connectivity had started reaching saturation in the West and at the same time the price of the mobile phones was driven down so as to make it affordable for the cost sensitive markets in India. It has taken the most advanced technology to be able to open up and address a huge but extremely cost sensitive market in India for mobile handsets. It's not just about connectivity, but advances in semiconductor electronics and ICT is increasingly helping make the world smarter, greener, safer and healthier. India can benefit from these advances and given the market size it offers, it can influence/shape these solutions.

While ICT based solutions will increasingly be shaped by growth markets in Asia, India has also been playing an important role in developing these solutions. Beginning with Texas Instruments setting up an R&D centre in Bangalore in India in October 1985 [14], most top semiconductor companies have

an offshore R&D centres in India. Around the chip design teams, the eco-system of EDA tools development, chip testing capabilities and also the system design houses with embedded software capabilities have now developed in India, such that there are multiple examples of world class products being developed here. This has been a journey which has taken a lot of hard work, dedication and drive.

5. Democratic Ways to Enable and Empower Underprivileged by means of ICT

In has already been emphasized that ICT activities in India are only three decades old. This would appear to be a very short time for a country to start from a poor base and start contributing at cutting edge frontiers of a very expertise intensive activity like semiconductor chip design. But this has already started happening as described in the previous section. The reason for this has been a culture which had valued scholarship for centuries. On the other end of the social spectrum are the centuries old problems of exploitation of Dalits and underprivileged as highlighted by Ambedkar. Here also democratic method of governance over last six decades has started showing some results. The main advantage of democracy and free media has been that these have always kept the problems of underprivileged visible at the surface as pockets of remediable injustice. Due to this constant pressure, a program called National Rural Employment Guarantee Scheme (NREGA) was initiated by the government in the previous decade. The aim was to create regular work (like road or water dam construction) for unskilled workers in rural areas. The guaranteed payment was promised from the government treasury. This was a fruit of democratic governance and could prove to be truly beneficial. However, soon it was realized that vested interests were siphoning off money in the middle. As a result, despite government spending huge sums of taxpayers' money, the benefits did not percolate to the real needy and underprivileged. At this stage, about five years back, a very ambitious ICT employing cutting edge technology was launched. This is described next.

One of the important causes of leakages of these welfare programs lies in identity verifications. Till recently, identity verifications are being done through physical verification of various identity documents like Ration card, driving license, passport, electricity or telephone bills. This process was considered prone to forging and identity theft. Government of India has launched a massive program of using ICT in creating a national unique identity called Aadhar [9] which is Digital and Verifiable online. This will completely eliminate physical verification process thereby addressing the problem of fake identity creation. Using state of the art ICT, Aadhar is expected to authenticate an individual as the unique person. Aadhar uses advanced biometric attributes, i.e., fingerprints and iris, which can be verified online through a central database over the telecom network.

Creation of database of Aadhar numbers along with identity attributes has been one of the largest ICT projects of the government in recent times. Moreover, database of biometric attributes of the entire Indian population may turn out to be one of the largest database in the world. The Indian government also plans to combine Aadhar database with existing banking system which can create Aadhar enabled bank accounts. Combining bank accounts with Aadhar will help in government giving direct cash payment to workers employed in National Rural Employment Guarantee Scheme. In this way, one of the largest ICT projects of government of India is addressing 'pockets of injustice" through ICT.

Apart from Aadhar, Electronic Voting Machine (EVM) [15] has played an important role in the largest democracy of the world. Traditionally, elections in India have been plagued by incidents of polling booth capturing and violence. Often, deprived and weaker sections of society have been prevented from voting. EVM, another unique innovation, has reduced the incidents of booth capturing and helped in curbing the debilitating effect of muscle power in election. EVMs now have been deployed in various central and state elections throughout the country and have been very successful in reducing the operational cost, time required for counting and conducting the election process more smoothly.

Mobile phones revolution as pointed out in the previous section has also helped in bridging digital divide. Let use review how cell phones have been an instrument of social justice. One of the biggest impact of cell phones in India is to enable communications between families and near ones of migrant

labours and other work force working in different parts of the country. The facility of communication by voice overcomes the problem of illiteracy; the facility of communication in mother dialect overcomes the lack of knowledge of English and decreasing cost of mobile phones gets over digital divide. Mobile phones have also played a great role for many Indian workers to find jobs directly with their customers without contractors or middlemen. This has been clearly evident for example for auto-rickshaw, taxi, cab drivers, small traders and hawkers. Several new innovative services have also been launched in the area of mobile agricultural information services, mobile Health etc which are having great social impact [16].

6. Conclusions

Due to historical and social reasons, India is facing many problems like a substantial part of population existing below poverty line, lack of health and educational facilities for the underprivileged and so on. The need is to establish a just society which enables both the privileged and underprivileged to flourish. In this article, we have examined the question: How can ICT, in particular, help in overcoming the obstacles that are appearing in establishment of a just society? Worldwide, the most dominant use of ICT has been to generate wealth and acquire power; the benefits due to these to privileged are quite well known in terms of increase in global production and trade thereby creating a digital economy.

In this article, we have reviewed some novel uses of ICT in EVM, mobile phones and creating a digital identity-Aadhar. Noticeable impact of Aadhar, mobile phones and EVM has been in strengthening the Indian democracy which in turn has the potential to create equitable distribution of wealth which benefits the deprived. Some of the unique requirements of Indian society have also shaped new ICT innovations. One unique example is mobile phone; it has taken the most advanced technology to be able to open up and address a huge but extremely cost sensitive market in India for mobile handsets. It appears that ICT innovations can shape and can be shaped by, Indian society in a way that can “create a democracy which is capable of removing the visible as well as hidden pockets of injustice".

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COMPUTER GAMES IN EDUCATION: CONFLICTS AND OVERLAPS!

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Abstract
Novel educational environments promote an increasing use of technological mash-ups, which include serious games. These games purpose is to facilitate learning and promote behavioural change, so this contribution debates their potential role into education. Beyond this traditional analysis, the authors explore the overlap between serious games and positive psychology as a way to minimise the ethical and social dilemmas of e-education which literature seems to disregard. Therefore, this paper acknowledges three major sections: computer/video games (overview and philology); serious games (overview, educational dimensions and political stance); and discussion (ethical issues, social dilemmas and get positive seriously).

Keywords
Serious games, education, ethical issues, social dilemmas, positive psychology

1. Introduction

In order to a computer games study be reliable, it is vital to outline some historical facts which lead to their emergence. What appears to be a distinctive market (computer games) is in fact a self-driven race for technological features and software development. Computer games are also becoming an important component for economic, social and political systems, which can be bounded to educational systems (de Castell & Jenson, 2004).

Since novel educational environments have two crucial requirements: (i) learners preparation for a cognitive economy, where knowledge is the most important resource for social development (Harasim *et al.*, 2000); and, (ii) increasing personalisation of educational materials and technological tools (including games) (Silva *et al.*, 2011) it is essential to understand their advantages and disadvantages. The reason to consider serious games as a new opportunity in education is simple: 88% of children between 6-17 years old play videogames from once a month to every day (parental information) (The Entertainment Software Association of Canada, 2007).

Although, which are the differences between a commercial and a serious game? While commercial games enable mostly entertainment or recreation, serious games facilitate learning and behavioural change (Wexler *et al.*, 2008). Even so, it is interesting to denote that serious games focus primarily design issues (Nadolski *et al.*, 2008), potential technological platforms (González & Blanco, 2008), relationship with learning theories (Becker, 2005), technological issues, standards and assessment (Moreno-Ger, Burgos & Torrente, 2008) and seems to disregard the ethical and social dilemmas that arise from cooperation or behavioural changes due positive psychology role.

Thus, the authors explore the overlap between serious games and positive psychology as a way to minimise the ethical and social dilemmas of e-education.

2. Computer/Video Games

2.1 Overview

A computer game is essentially a game played through a computer, in which gamers control the visible items on screen just for enjoyment (Feibel, 2006). However, are computer and video games diverse? While, a videogame acknowledges an *audiovisual apparatus* with the aim to play, as well as,

may perhaps entail a story (Esposito, 2005); a "a computer game is a voluntary interactive activity, in which one or more players follow rules that constrain their behaviour, enacting an artificial conflict that ends in a quantifiable outcome" (Zimmerman, 2010). Thus, a computer game is at some extent a video game development.

2.2 Philology

Hitherto, literature acknowledges a lack of consensus about computer games philology. Despite this assumption, the authors shed some light over analytical dimensions: game categories; and, gamers' numerical categories.

Game can be divided into six categories (Squire, 2003): (i) *casual*, have lower levels of complexity which explains their popularity and accessibility; (ii) *skills*, promote players' mental or physical growth; (iii) *strategy*, the designer develops a set of rules and objectives and the players choose their strategies; (iv) *simulation*, mock-up of an real or imaginary system; (v) *training*, aims tutors to promote participants interest, as well as, it involves a enjoyable and fun training; (vi) *educational*, games with an explicit educational goal. And, according to Sotirova (2004) gamers' numerical categories are: (i) *one-person*, a player assumes an independent strategic choice without any constraints; (ii) *two persons*, typically denotes family games; (iii) *multiplayer*, played in multiple physical spaces and connecting numerous players; (iv) *massive multiplayer*, virtually global games.

3. Serious Games

3.1 Overview

Serious games theoretical underpinnings indicate also a lack of consensus, as the subsequent examples demonstrate:

- video games with exclusive design for training and education (Annetta, 2010);
- games that move from amusement *per se* to learning in its broadest meaning (Stone, 2008);
- a mental competition mediated through ICT with precise rules to endorse governmental or corporate training (Zyda, 2005).

These can be classified into eight categories (Nählinder and Oskarsson, 2007): (i) *advergaming*, product advertisement; (ii) *edutainment*, educate and amuse; (iii) *games-base learning*, learning outcomes; (iv) *diverted*, political or geopolitical issues; (v) *simulation*, simulate an aspect of reality; (vi) *persuasive*, promote behavioural changes; (vii) *organisational*, teach and reflect about organisational dynamics; (viii) *educational*, primary and secondary education. Thus, these are key components within technological mashups that characterise future learning environments.

3.2 Examples

Despite its early stages of development serious games are already explored in a myriad of organisational environments, as for instance: higher education, companies, military or government. The following examples illustrate these organisational perspectives, as well as serious games potential for multidisciplinary learning and behavioural change (Wexler *et al.*, 2008).

InVivo Cell Environment

The University of Toronto explores InVivo in Graduate and Master Programs, since future healthcare professionals can understand human cells behaviour. That is, learners can: (i) visualise cells biological structures and their mobilisation inside human body; (ii) reflect upon the advantages/disadvantages of cellular transplants through physiological responses; (iii) comprehend cells biological resistance by changing parameters (drugs impacts). Note that such game comprises all types of cells (e.g., brain, blood, etc.), as well as the 3D environment facilitates learning (InVivo Communications, 2013).

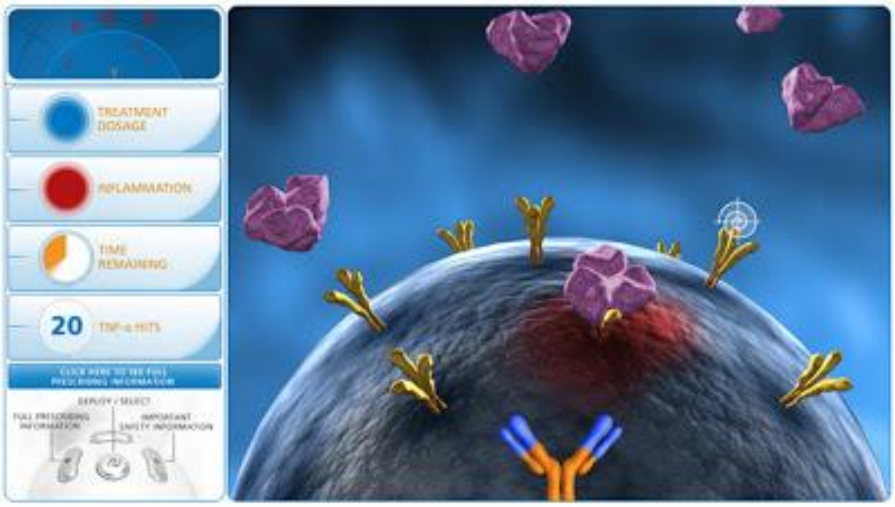

Figure 5. inVivo Cell Environment Source: InVivo Communications (2013)

Quest Atlantis

This game is a 3D multi-user virtual environment that intersects history, natural environment and human actions in order to children learn about social rules and the impacts of their decisions into the environment. Therefore, the Williford Elementary School on North Carolina enables Quest Atlantis to promote learning regarding social rules and environmental behaviour (Atlantis, 2013).

Figure 6. Quest Atlantis Source: Atlantis Quest (2013)

Cesim Global Challenge

Huhtamaki is a Finnish packaging company that operates globally and utilises Cesim Global Challenge to promote workers continuous learning (Cesim, 2013). The game acknowledges complex decision making in international management, namely regarding companies that operate globally. Hence, learners have to: (i) elaborate the project finance for new markets (e.g. taxes, capital; investment, human resources, etc.); (ii) detail the company marketing and strategic behaviour (e.g. product characteristics, marketing policy, etc); (iii) understand their decisions impact throughout corporate indicators (Cesim, 2013).

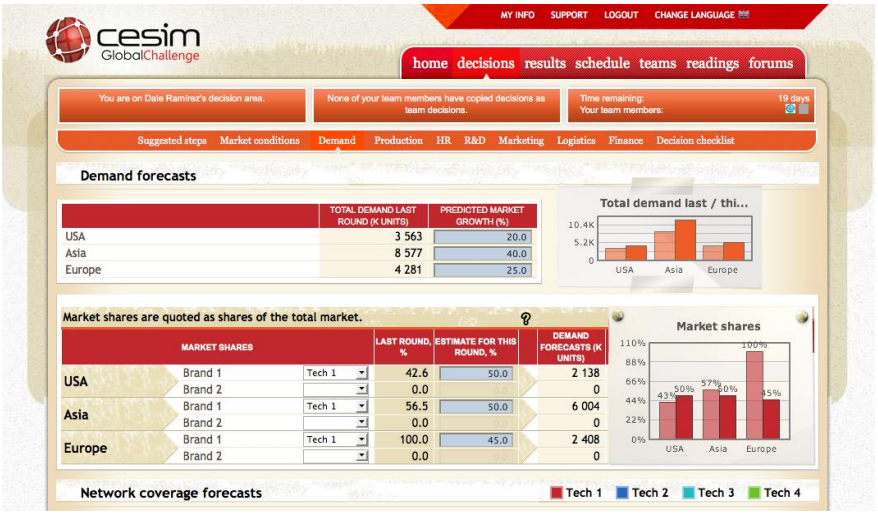

Figure 7. Cesim Global Challenge Source: Cesim (2013)

Ranger Online Game

Omega Games has developed a series of games for the US Rangers through a 3D immersive environment (Omega Games, 2013a). Through the use of 3D glasses militaries can choose from a wide range of warfare scenarios and missions, and the game monitors their performance (game results) but also their physiological responses (heart rhythm, blood pressure, etc.) in order to understand their response to stress. In addition, the game permits to generate novel war scenarios or import old ones (Omega Games, 2013a).

Figure 8. Ranger Online Game Source: Omega Games (2013a)

Cross Cultural Competence Trainer

Cross Cultural Competence Trainer aims to improve learners' knowledge, skills, abilities, and attitudes in multiple cultural environments. The game enables a 3D environment with civilian, military, government officials' characters in order to help learners better understand social interactions (colloquial and facial expressions, attitudes, etc.) (Omega Games, 2013b). Of course, the US Department of Defense exploits this serious game to improve its service member's knowledge regarding other cultures.

Figure 9. Cross Cultural Competence Trainer Source: Omega Games (2013b)

3.3 Educational dimensions

A key challenge in serious games is to construct valid content and intuitive interfaces, which according to Werkhoven and van Erp (2007) are: (i) *valid content*, realism about the contextual environment, as well as the need to learners experience causal and non-causal relations; (ii) *intuitive interfaces*, promote creative and educational procedures. That is why serious games characteristics frame vocational (experiential and problem-solving) instead of formal learning (de Freitas, 2006); although, in order to be effective these must fulfil seven principles (Gee, 2007):

- co-design- players involvement in game design;
- customise- dynamism and adaptability to learning styles and preferences is crucial;
- identity- the learner needs to consider how meaningful is their work;
- manipulation and distributed knowledge- facilitate learners recognition about skills;
- pleasantly frustrating- the trade-off between game difficulty and interest/motivation;
- information on-demand and just-in-time- the importance of visual cues to help learners comprehend which knowledge is applicable in each circumstances;
- well-ordered problems and stripped down versions- educational materials must be fashioned without disregarding its level of complexity.

Educational content within a game does not resume educational goals achievement, as well as illustrates pedagogic changes over games generations (Gunter, Kenny and Vick, 2008): (i) *first generation*, behaviourism and cognitivism; (ii) *second generation*, constructivism is added; (iii) *third generation*, a blend of all theories. In spite of these improvements learning assessment continues to be difficult, even when non-traditional assessment techniques are explored (e.g., Shute *et al.*, 2011). Finally, content responsibility moves from the lecturer to game designer (educational challenge), which in specific contexts has alarming effects (e.g., military context). This role transfer undermines lecturers' power position, which may explain their non-acceptance regarding serious games (ethical dilemma).

Design vs. platforms

To excel serious games infinite potential educationists ought to think ''out of the box'' and ''lateral''. Sabri *et al.* (2010) conclude that serious games introduce a learner centered approach, i.e., a hypothesis for active and critical learning. Moreover, also facilitates experiential learning due to game interaction namely in virtual environments whatever the technological platform.

Learning theories vs. user trends

Resnick (2002) believes that a successful future education will frame on our ability to think and be creative. To achieve these goals it is essential novel approaches to learning, since serious games are increasingly becoming accepted as a learning tool (the end product of some process)! However, to

understand current learning theories in serious games is fundamental to know who is learning what, where, and why (user trends) (table 1).

Table 11. Learning theories vs. user trends

Aspect	Behaviourist	Cognitivist	Humanist	Social and situational
View of the learning process	Changes behaviour	Learner cognitive skills	Development of personal potential	Interaction and observation in a group context
Site of learning	External resources and tasks	Making connections	Emotion, attitude and thinking	Relationship between people and environment
Purpose in education	Produce behavioural change in desired direction	Develop capacity and skills	Become self-reliant, autonomous	Full participation within the community

Source: Adapted Kirriemuir and McFarlane (2004, pp. 13)

Gardner's Theory of Multiple Intelligences relates our different strategies for learning with our capabilities. Gardner (2006) assumes eight primary forms of intelligence: linguistic, musical, logical-mathematical, spatial, body-kinesthetic, intrapersonal (e.g., insight, metacognition), interpersonal (e.g., social skills), and naturalistic (sensitivity to natural phenomena). This theory also recognises that each culture values and emphasises particular intelligences in favour of others.

Assessment standards

What to look for in a serious game and how to assess it? An accurate evaluation resumes a two dimensional analysis: the edutainment environment; and, pedagogical considerations.

An edutainment environment must reflect eight factors (Hussain, Embi and Hashim, 2003): (i) *meaningful learning*, provide environments in which learner find it useful to learn; (ii) *goal*, objectives to accomplish throughout the game; (iii) *success*, environment design ought to promote learners ; (iv) *challenge*, crucial to enhance learner motivation; (v) *cognitive artefact*, cognitive artefacts permit learners to express their thoughts or ideas; (vi) *association through pleasure*, learning should acknowledge positive and pleasant emotions; (vii) *attraction*, learners wiliness to be immersed into the game and spend time learning it; (viii) *sensory stimuli*, motivation plays a key role in any learning activity and an edutainment environment is not an exception.

Pedagogical progress analysis is verified through sequential educational technologies, as for instance a Sharable Content Object Reference Model (SCORM) and workflow integrated into a Learning Management System (LMS). And beyond the traditional multiple choice queries, Felicia (2009) acknowledges scoring mechanisms (e.g., time to complete the game or level) or casual diagrams (learners drawings based on their understanding of each game level or objective) as potential assessment criteria.

3.4 Political stance

In spite of serious games potential for education the European Union (EU) has not worked out any cohesive policy, within a centralised and shared vision for these games (expressed in a proposal). However, as an education support element, it is something the EU educational policy is particularly interested in. The idea to use computer games for education invokes some historical roots (McCartly *et al.*, 2012), although this contemporary interest entails two reasons: (i) year after year young people (and not only) devote increasing time to computer games. Apart from entertaining or amusement, these acquire experience and skills regarding digital technology (e.g., game consoles, tablets, smartphones, etc.) (Piaskowska, 2010); (ii) the marriage of education and cutting-edge entertainment technologies (games) led to the creation of so called *edutainment*. This solution boosts the learner's motivation and influences the interaction between lecturers (or an educational tool) or learners (McCartly *et al.*, 2012).

The absence of a shared view denotes each state member decision regarding the educational model, despite a converging model of qualifications (ECTS). However, the EU is keen in recognise the

importance of educational ICT in which serious games are included. Some of the latest European initiatives regarding games potential benefits in education are the following projects:

- Games and Learning Alliance (GaLA)- joint project with partners from 14 countries of the EU which started in October 2010. Its scope is to create a European Virtual Research Center for gather, integrate, harmonise and coordinate research on Serious Games. Its funded by the European Union in FP7- IST/ICT, Technology Enhanced Learning with a budget of 5.65 million Euros (Alhadeff, 2010);
- Increasing Mainstreaming of Games in Learning Policies (IMAGINE)- aims to influence policy makers (and other decision-makers within educational institutions) for a universal usage of serious games. The European Commission has funded this project under the Lifelong Learning Program (Alhadeff, 2010).

4. Is for "real"? Get "serious"!

Carr (2000) discusses how e-education poses different ethical and social dilemmas, so if serious games are ICT-based is reasonable to argue that their quandaries are analogous.

4.1 Ethical issues

Some learner's unethical practices in e-education are (Stahl, 2002): cheating, intellectual property, plagiarism and copyright violations, privacy versus surveillance, personal data versus identity, integrity and honesty. Social interaction and individual behaviour are determined by numerous motives or, dissimilar reasons matter for unlike people in a similar context (Mooradian, Renzl & Matzler, 2006), which may induce or not cooperation. For example, the power transfer from the lecturer to game designer (educational content) and to learner (learning process) (Swertz, 2009) may undermine serious game adoption by the lecturer. Or, since serious games require a robust ICT infrastructure it may increase unethical behaviours (different from traditional learning environments) or produce ethical quandaries (equity of access).

4.2 Social dilemmas

Serious games produce a shared social space similar to networked or multiplayer computer games. Following Rauterberg, Daetwyler and Sperisen (1995), a shared social space enables a three dimensional communication analysis: (i) visibility (e.g., facial expression, gesture); (iii) audibility (e.g., voice, intonation, sound); and, (3) social nearness (e.g., physical distance). In addition, audibility is divided into verbal and non-verbal communication channels. Therefore serious games worldwide application will reinforce a global culture (cultural imperialism) or, promote a glocal response? The authors are in favour of a glocal response since serious games characteristics act as a boundary, as well as promote a glocal understanding. An example is the Cross Cultural Competence Trainer which the US Department of Defense explores.

4.3 Get positive, seriously!

Christopher Peterson (2006) suggestion is that "positive psychology the scientific study of what goes right in life, from birth to death and at all stops in between" (p. 4) or, "making normal people stronger and more productive and making high human potential actual" (Seligman and Csikszentmihalyi, 2000, pp. 8).

In order to achieve such psychological state Kauffman (2006) denotes four principles: (i) *reverse the focus from negative to positive*, most people tend to dwell on negative events and disregard the positive ones; (ii) *develop a language of strength*, help people to discover more positive qualities/personal strengths; (iii) *balance the positive and negative*, foster the positive emotions or qualities of itself and others; (iv) *build strategies that foster hope*, cultivate hope in order to minimise

the problem. This personal development is comparable to an ethical reflexivity which presumes moral intuition (bond with Kohlberg's work on moral judgment) (Stahl, 2011).

Considering that positive psychology principles give novel insights to educators, these will be able to question:

- How optimistic are their students about their skills, competences or knowledge?
- How realistic are their plans for achievement?
- How do learners compare their achievement with others and its affect on learning?
- How to promote a flow experience to learners?

Plus, serious games help people to cultivate (McGonigal, 2012): (i) a full range of positive emotions and engagement; (ii) stronger social connections and relationships; (iii) more resilience when facing challenges and obstacles; (iv) additional ambitions and surprising accomplishments; (v) and, serve a higher purpose. Bottom line, if positive psychology acknowledges the conditions and processes that contribute to the flourishing or optimal functioning of people, groups, and institutions, it can be correlated to the purpose of education: to foster social development. This view is shared by Grant, Stahl and Rogerson (2009) in their research about positive psychology and ICT professionals.

5. Conclusion

This paper recognises the potential advantages of serious games as a learning tool. However these exciting educational technologies have a long way to go, since it is essential to retort design issues, its relationship with learning theories, and assessment procedures. Serious games adoption may provide a unified psychology for optimal human learning (satisfaction, motivation, and productivity), which positive psychology may induce or boost. Despite this theoretical underpinnings, institution-level applications of positive psychology are in preliminary stages namely in higher education, so further research is a *sine qua non* condition. Concluding, the authors expect to receive valuable comments and suggestions regarding future research decisions during ETHICOMP 2013.

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EVALUATING RESEARCH QUALITY IN TECHNOLOGY ETHICS

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Abstract
Researchers and academics in most research systems are evaluated on the basis of the quality of their work. Such evaluations are the basis of decisions about promotion and tenure. They also form an important part of applications for grants, fellowships or other research income, which, in turn, have implications for research careers. Evaluation systems use for this purpose tend to be based on disciplinary measures. This can raise specific problems for researchers who are active in areas that sit between different disciplines with computer ethics, ICT ethics or technology ethics being a case in point. This paper explores possible ways of dealing with this and establishing criteria that can help researchers in such interdisciplinary fields to strengthen their case when arguing for the quality of their work.

Keywords
Research quality, publication, evaluation, metrics, criteria

1. Introduction

The evaluation of the quality of research output is continuing to gain in importance, both for the evaluation of individuals and for groups, centres and institutions. For individuals such evaluations are of crucial importance for their individual careers as they strongly influence their ability to successfully apply for position and subsequently get promoted. For groups, centres, institutions etc. the evaluation of the quality of research output influences external esteem and thereby the ability to gain research funding. Research quality is one of the key determinants of academic discourses and most participants in such discourses profess to desire highest quality.

There are numerous shortcomings in the quality-related discourses just outlined. One key problem is that quality can be an ephemeral phenomenon and, like beauty, often lies in the eyes of the beholder. What counted as high quality research yesterday may today be unmasked as having been built on fallacious assumptions. Different disciplines and even different factions within one discipline will fight vehemently about what constitutes good research. Another critique could be that quality regimes often mask power relationships. Defining criteria of quality equates to the establishment of regimes of truth in a Foucauldian (Foucault, 1975) sense. The presence of large amounts of research funding leads to a quick translation of the power struggles concerning the right to define quality into financial interests. Introna (2003) has shown that these principles apply to the field of information systems.

The present paper, while cognisant of the larger issues around the very idea of measuring and assessing quality of research, will discuss the question how quality can or should be measured for research on ethical and normative questions concerning technology. To use a sporting metaphor, this paper is not so much about a critique of the game but about how to understand, interpret and influence the rules in a way that makes the whole game more receptive to the standing of the outfield player, the technology ethicist.

The purpose of this paper is not so much a rigourous academic review of research quality and evaluation, but rather an attempt to stimulate a discussion among the participants in the ETHICOMP conference to find out whether and to what degree the current state of quality evaluation is perceived as a problem and, if so, what the conference community could or should do to influence the state of play.

2. Research Quality Criteria in Technology Ethics

By engaging in the question of how to measure the quality of research, this paper are implicitly acknowledges that this question can be legitimate. Research funders have a legitimate interest to find out whether the results of the research they support are of good quality. Decisions have to be made about the allocation of scarce resources such as research funding or academic positions. It is widely accepted that such decisions should be based on information about the quality of the research undertaken by applicants. Why be thus acknowledge that the question for research quality is justifiable, we realise that it is difficult to come to an agreement on what constitutes quality and how it can measured. This paper therefore suggests different classifications of evaluation schemes and discusses possible input and variables.

The specific angle that this paper takes is that of technology ethics which is an area of research that covers computer ethics, ICT ethics, engineering ethics and others and that many of the participants of the ETHICOMP conference are likely to be part of. The specific challenge raised by a this field is that it is highly interdisciplinary and is not have a large number of specific community-wide outlets, nor does it have a strong disciplinary identity or history that would give indications of research quality.

1.1 Level of Evaluation

When looking at the evaluation of research quality, it is important to note that this can be assessed at different levels. The most widely used level of abstraction in quality evaluation is the individual work or output, such as a journal or conference paper or a project application.

The next level of evaluation and the one alluded to in this paper so far is that of the individual. Individual scholars can be evaluated in the context of regular academic review of their work or because of applications for funding promotions they may have submitted.

It is important to see, however, that research quality evaluation can happen on different levels as well. One example of this is the evaluation on the level of the Department or research group. Such evaluations can be used to decide organisational strategies or the allocation of resources to different departments. In the UK, for example, the current research excellence framework, which is the successor to the more widely known research assessment exercise, focuses on so-called units of assessment which are based on traditional disciplines and often cut across academic departments.

Research can furthermore be evaluated on an institutional level, for example when looking at University rankings which can be discipline specific or which can be or general. Finally, one can find examples of comparison of research quality and output between states and regions, which are based on underlying metrics.

The level of abstraction used for evaluation Internet strongly the input required and mechanism by which an evaluation is done. One important factor in this context is the degree to which quality indicators are perceived to be objective.

1.2 Levels of Objectivity or Subjectivity in Evaluation

Evaluations of research quality are based on ontological and epistemological assumptions. These can be recognised in the alleged level of objectivity or subjectivity. The question whether quality is an objective attribute or subjective depends on the definition of the term. We would like to underline that the most, if not all, evaluation mechanisms rely on a combination of subjective and objective input.

At the basic level of evaluation of an individual research output the standard evaluation mechanism is that of peer review. This can be found across most disciplines and it is also the basis of many institutional evaluation processes, such as the UK research excellence framework. It is worth pointing out that peer review, while relying on a broad set of possible quality criteria, is fundamentally subjective as the application of quality criteria to a piece of work depends on the interpretation of these criteria by the evaluator.

In addition to the subjective measures of peer review, evaluation processes often draw on additional apparently more objective measures. Frequently these are quantified numerical variables such as the amount of research income, Ph.D. student completions or citation indicators.

It is important to point out that even such apparently objective measures are based on subjective assumptions and decisions. For example, when looking at citation data, a qualitative decision estimate which outlets are included into a citation analysis. Similarly, for Ph.D. completions one has to choose a cut-off date after which a student counts as a non-completion. It is thus important to remember that even apparently objective measures are never objective and that the underlying decisions that determine their outcomes are driven by a specific interest and have different consequences for different subjects of evaluation.

1.3 Objectivist Quality Indicators

This paper is particularly interested in the type of evidence or indicators that can be used to assess quality of research in technology ethics. These are not fundamentally different from indicators that can be used in other areas and disciplines but the race specific problems due to the interdisciplinary nature of the field. In this paper we concentrate on apparently objective quality indicators and tried to deconstruct their origin with a view to reconfiguring them in a way that is suitable for technology ethics.

We concentrate on two objectivist (the term is used to denote the appearance of objectivity) indicators, namely citation metrics and journal rankings.

Citation metrics

Citation metrics work on the assumption that authors will cite other work when they find it valuable and making an important enough contribution to their work. Citations are thus seen as a proxy for peer esteem. This assumption is open to critique, as the purely quantitative measures of citation are blind to the context and whether a paper has been cited positively or negatively. Citation measures can be applied in different ways. Publish or Perish (http://www.harzing.com/pop.htm), for example, which is a freely available tool, calculates the following citation metrics:

- Total number of papers
- Total number of citations
- Average number of citations per paper
- Average number of citations per author
- Average number of papers per author
- Hirsch's h-index and related parameters
- Other quantitative parameters.

Publish or Perish makes it clear that these citation metrics depend on the quality of the input, i.e. the pool of publications that are used to determine citation counts. Publish or Perish is based on data collected by Google Scholar, which is probably the broadest publication database. Other citation metrics can be obtained from other commercial providers, such as Scopus or Web of Knowledge. These tend to have the advantage of being more specific and reliable, but they have the disadvantage of a narrower coverage.

Publication databases tend to focus on clearly identifiable fields of scholarship and are often strongest in scientific, medical and engineering fields. This is a problem for scholars in technology ethics, who often publish their work in venues that are more closely aligned to social sciences or humanities.

Journal Rankings

A further widely used objectivist measure of research quality is reflected in journal rankings. The idea here is to use quality of journals as a proxy of the quality of research published in them. This is a widely used approach and there are numerous ranking of journals and conferences that convey the purported quality of different outlets. Such journal rankings, as any other attempts to reduce complex

phenomena to a single linear or even quantitative scale, are fraught with difficulty. It is obvious even to defenders of this approach that the quality of outputs published in the same journal varies. The main advantage of journal rankings seems to be that they are very easy to use. They also allow researchers to make decisions on where to publish.

Journal rankings can be compiled using purely quantitative indicators, such as journal impact factors or journal h-indices. Many journal rankings go beyond this, however, and include aspects of expert opinion, for example by surveying leading experts in the field or undertaking qualitative research to understand the influencing criteria.

In the field of computer ethics and technology ethics more broadly journal rankings have to contend with the same set of problems that citation metrics do, namely the fragmented and interdisciplinary nature of the work undertaken there. This often makes it difficult to publish work that is not perceived to be at the core of a discipline and thus of a particular journal. This is particularly true for journals with high impact factors that define the core of disciplines and that often exert strong control over the type of research that is considered appropriate.

3. Existing Evaluations in Related Fields

The brief introduction to some of the more prominent objectivist criteria for the evaluation of research quality serves the purpose of reminding ourselves which mechanisms are used and how they relate to the field of technology ethics. The purpose of the paper is to consider how these discourses can be used to the advantage of the researchers working in the field. It should therefore be read as an invitation to the computer ethics community to participate in this endeavour of constructing a quality system or outlet ranking that will allow the community's members to argue for the quality of their work. To return to the Foucauldian idea mentioned earlier, this is an explicit and reflected attempt to construct an alternative regime of truth to counteract the currently dominant ones.

For this project to be successful it will require the buy-in from a significant part of the community and it will need broad input in order to avoid the development of blind spots. The remainder of the paper therefore collects examples of existing quality regimes with a view to encouraging a debate on how these can be used, developed or subverted for the advantage of scholars working on technology ethics.

This section is thus not to be interpreted as a compressive overview but as input into a discussion to be started at the ETHICOMP conference and hopefully to be developed form there.

3.1 Existing Quality Rankings

A first step in establishing how to understand the different quality regimes in which contributors to technology ethics work is to identify the reference disciplines they find relevant. Likely candidates include:

- Business / management
    - Information Systems
    - Business ethics
- Philosophy
    - Science and Technology Studies
- Law
    - Information law
    - IP law
- Computing
    - Data bases
    - AI
    - Computational theory

    - Hardware
    - Software engineering
- Engineering

In each of these areas there are likely to be journals and other outlets that are more inclined to include work on ethics and those

- Specific ethics and technology
    - Ethics and Information Technology
    - Journal for Ethics and Communication in Society
    - Engineering Ethics
    - Science, Technology and Human Values
- Information systems
    - MIS Quarterly
    - Journal of Information Systems
    - Journal of the Association for Information Systems
    - Information and Organization
    - European Journal of Information Systems
- Computer science

This indicative list will need to be developed in collaboration with members of the community. For each reference discipline it should then be explored whether rankings are currently used and, if so which ones.

In parallel to this, currently existing rankings should be analysed with regards to their underlying assumptions and criteria. This may include the following rankings:

Table 1: Examples of journal rankings and publication databases suitable for ranking journals

Name of Organisation	URL	Remarks
Association for Information Systems	http://lamp.infosys.deakin.edu.au/era/	
Computer Science Journal Ranking	http://www.ntu.edu.sg/home/assourav/jrank.htm	
Association of Business Schools	http://www.associationofbusinessschools.org/content/abs-academic-journal-quality-guide	
Australian Council of Professors and Heads of Information Systems	http://www.acphis.org.au	
Harzig	http://www.harzing.com/jql.htm	
ISI web of knowledge		General citation database
SCOPUS		General citation database
Google scholar metrics	http://scholar.google.co.uk/citations?view_op=top_venues&hl=en	Ranking of journals by h5 index

3.2 Quality Indicators

Continuous quantitative indicators such as journal impact factors allow simple rankings. One of the problem of this approach is that there are often minimal differences in the quality indicators that can lead to the appearance of quality differences between outlets where these are negligible. A widely used alternative is therefore the categorisation of outlets in larger categories. A frequently used one is based on school marks of A, B, C, sometimes including D or A+ as additional differentiators.

The UK has used a system of star evaluations in its 2008 Research Assessment Exercise that will continue to be used in the 2014 Research Excellence Framework (www.ref.ac.uk):

4*	Quality that is world-leading in terms of originality, significance and rigor
3*	Quality that is internationally excellent in terms of originality, significance and rigor but which nonetheless falls short of the highest standards of excellence
2*	Quality that is recognised internationally in terms of originality, significance and rigor
1*	Quality that is recognised nationally in terms of originality, significance and rigor
Unclassified (u/c)	Quality that falls below the standard of nationally recognised work. Or work which does not meet the published definition of research for the purposes of assessment

4. Further Steps

The purpose of this paper, as mentioned before, is to start a discussion in the ETHICOMP community how the topic area of research quality can be turned to its advantage. The implicit suggestion so far was that it might be desirable to establish a position on quality that can serve as a reference to others. Notable examples of this are the attempt by the London School of Economics researchers in information systems to establish their ranking (Leslie Willcocks, Edgar A Whitley, & Chrisanthi Avgerou, 2008) or the official position of "Senior Scholars" of the Association for Information Systems to support the quality of a "basket" of journals (http://home.aisnet.org/displaycommon.cfm?an=1&subarticlenbr=346).

If this is the way forward, then it raises a number of additional questions that need to be decided. These include:

- Which approach is taken (e.g. combination of existing lists, Delphi Study)?
- Which methodology is used? How does it build on and differ from existing methodologies?
- If a survey approach is used, who are the individuals surveyed?
- Which criteria are used for the selection / inclusion of journals?
- How and where could such a study be published?

The discussion of the ideas presented in this paper should contribute to a better understanding of whether and to what degree research evaluation practices are perceived to be problematic by the ETICOMP community. This will hopefully create the momentum to address these issues, possibly by developing an alternative view of journal quality as perceived by the community. We are aware that this is a deeply political process that will be highly contested, but we think that it may be beneficial, in particular to those individuals for whom research evaluation is part of their research governance structure.

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TO MAKE SODIS CLOSER TO THE PROJECT MANAGEMENT PROCESS

Stan Szejko and Sara Wilford

Abstract

The paper aims at improving analysis of ethical risks of a software project as done with the *Software Development Impact Statement*. Some insight into the SODIS analysis is given while integration of its steps with project management activities make the leitmotiv for the proposed modifications.

Keywords

Software project management, risk management, computer ethics, impact analysis, SODIS

1. Introduction

According to Chaos Reports (Table 1) only about 30 percent of IT projects end with a success i.e. bringing satisfactory and good quality solutions within their schedules and budget limits.

Table 1. The Standish Group selected benchmarks of IT projects SGR]

	2000	2004	2009
Projects successfully completed	28 %	29 %	32 %
Over budgeted / time exceeding / incomplete functionality	49 %	53 %	44 %
Projects cancelled during their run	23 %	18 %	24 %

Some improvement in the situation is expected with the growth in advanced software development methods and tools, systematic requirements engineering, progress in quality assurance as well as in project management techniques and risk coping strategies. Project risk is understood as a chance that some unwelcome consequences can happen at any time throughout a project – risk management is seen as a possible remedy to the situation.

Impact analysis examines the nature of project risks. Attention to subsumption ethics as well as project management principles that apply stakeholder impact analysis within the framework of Software Engineering Code of Ethics and Professional Practice [ACM/IEEE] significantly reduce risk and result in better software [Gle2001].

SODIS, *Software Development Impact Statement*, provides an approach to software project risk analysis and planning techniques and expands software risk to include social, professional and ethical aspects – both, of a software development process and the more general obligations to various stakeholders [Got2001]. The SODIS process is able to identify significant ways in which the completion of individual tasks may negatively affect stakeholders and to identify additional project tasks or modifications needed to prevent any anticipated problems.

Our experience shows SODIS to be of great use in risk identification and analysis. It ensures that the needs of project stakeholders are considered, implies mitigation of many problems, and improves software quality. A lot of successful SODIS applications can be found in literature, f.e. in [Koh2003, GCK2008, BP2011]. However, we think that the use of SODIS as a potentially powerful project management tool has been missed. By better developing the project content and integrating the SODIS process with project and risk management, we can improve SODIS in this area thus gaining greater user and project manager acceptance.

Hence the paper does not pay much attention to risk analysis and management methods. Instead, it brings slightly more insight into the SODIS analysis concerns and needs, and tries to focus on integrating SODIS steps (and its supporting tool) with project management activities. We start with a brief discussion of the project and risk management processes, and through discussing some SODIS

problems and shortcomings, we end with some suggestions towards its improvement and integration into the project management process.

2. Project and risk management process

The term *project management* (PM) encompasses a number of aspects involved in meeting the goals necessary to complete a project successfully, in time limits and within its budget. Standards have arranged the management processes into nine areas, including Project Scope, Quality and Human Resources Management [PMBOK, IEEE Std 1490-98].

Project Risk Management (RM) makes one of the areas. *Risk* is a probability that something (an event, an action) can hamper the project's overall success, even result in its complete failure. Thus project RM deals with the processes concerned with identifying, analyzing, and mitigating risk. As SODIS expands software risk we should start with a brief look how PM and RM are currently combined and conducted.

2.1 Project management process and its actors

PM activities are typically grouped in *stages* or *phases* according to the project lifecycle - this allows the PM team and the PM team leader to effectively manage the project timeline in a logical and concise manner. The conclusion of a specific project phase usually *results* in the completion of its particular major *deliverables.* Anyone who is actively involved with the project – during any phase – may be regarded as a *stakeholder* (an active one), as well as anyone who may be positively or negatively affected by the project's outcome. Thus they can be individuals such as customers or sponsors or whole groups such as performing organizations and the public [PMK]; there can also exist also *abiotic stakeholders*, like f.i. a computer net.

According to [PMB], regardless of the methodology, PM processes are grouped to *Initiation, Planning/ Design, Production/Execution, Monitoring & Control, Closing* [Figure1]. Marciniak & Reiffer point to difference and synergy between The Buyer's (The Customer's) and The Seller's (The Developer's) PM models [MR1990].

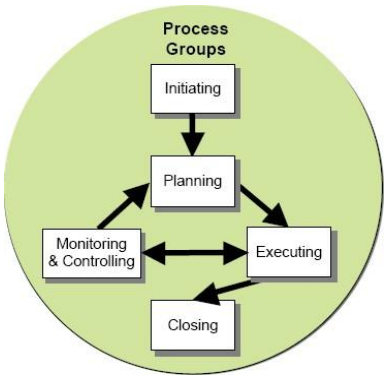

Figure 1. The project development stages. Wikipedia, after PM Guidelines of US VA

[NYS] states that while no two projects are exactly alike, all projects should progress through the same five project management phases: *Origination, Initiation, Planning, Execution and Control, Closeout*. For the purpose of further discussion and risk-coping activities (see Table 2) we assume a PM line of

- *Project Origination*, when a project to create a product or develop a service that can solve a problem or address a need on the Buyer's Side is proposed.
- *Preliminary (Initial) Planning*, that aims at stating/identifying the project main assumptions, its process shape, required resources and infrastructure, as well as time schedule.

- *Contracting and Initiation* - The approved Preliminary Plan makes a basis for a call for proposals, including its related statement of work; contracting or an in-house decision identifies the Project Team, instantiates the project and brings about a formal project "kick-off".
- *Project Planning* refines and augments The Preliminary Plan and its stated deliver-ables; Work Breakdown Structure (WBS) is developed. Project-specific items such as configuration management or problem and change control are added and the project organizational structure defined [ANSI/IEEE]. Decisions of the Planning Phase (and the succeeding PM activities) are agreed, often iteratively, among The Buyer and The Seller teams; and although the plans have to be in common, The Developer prepares its internal plans – including risk evaluations;
- *Project Execution and Control*, where tasks are executed (in many projects the activities include also preparing The Buyer organization for the implementation of the project outcomes and for taking over the product/service responsibility from the Project Team [NYS]); plans for oncoming phases are detailed and adjusted.
- while *Project Closeout*, the Project Team assesses the project – its outcomes, a degree of satisfying project success measures and the Project Team performance.

2.2 Risk Management

RM is a systematic approach for minimizing exposure to potential loses [AD]. A widely accepted RM approach consist in [PMBOK, MS2004, SA2011, WPB1999]

- *Risk Identification and Analysis* – activities are aimed at disclosing the project potential risks, weighting and prioritizing their probability and impact, thus transforming risk data into decision-making information;
- *Mitigation Strategy Planning* – translating risk information into decisions and mitigating actions and integrating them with the project plans. This in fact can essentially impact on the project strategy (see suggestions for *strategy-on-risk* dependencies and selections in [Tho1993]);
- *Implementing* those actions, then *Tracking and Control* that monitors risk indicators and corrects mitigation actions (in bigger projects done on a monthly basis MR1990]).

Risk Management Techniques

Current practice of RM is mostly intuitive, drawn from the personal experiences of project managers. However, there exist various methods to arrange a systematic RM process, five of them (Boehm's Method, RISKIT, SEI-SRE, SERUM and SERIM) discussed and referenced in [SA2011]. Then, a lot of papers are devoted to identification techniques (like checklists or brainstorming) and to risk analysis and evaluation with qualitative or quantitative methods [Jon1994, McC1996, Rot2008, SEI]; in [MG2004] an approach to software risk identification based on risk patterns is proposed.

RM along the PM process

"If you identify your risks too early you will not have enough information specific to that project,… if you wait until you have completed project planning, the risks you identify may then be serious enough that you will have to revise the schedule, budget, or tasks to accommodate the risks. Consequently, the best solution is to initiate project planning, then complete the initial steps of RM (including risk identification), and finally update your project planning in light of the risks you face" [MS2004]. In Table 2 we tried to place the RM concerns and activities along the PM phases

Table 2. Project and risk management lines

Project Phase	Deliverables / project knowledge	Stakeholders	Risk concerns and activities
Origination	Project proposal (Business Case) Goals Business Project scope and vision Budget Management commitment	Proposer, Sponsor, Meaningful stake-holders on Buyer's side, Developer (concrete or abs-tract), Co-projects, Environment	Main risks, like lack of financing or delays in preceding projects or resource availability
Preliminary or Initial Planning (IP)	Feasibility Study (optionally) Preliminary Plan: Goals, scope, key requirements, deliverables, success measures, costs, limitations, interrelated projects Development strategy, main tasks, technology, rules for management and quality ass. Resources, infrastructure, team organization, team structure and composition communication lines, documentation formats Time schedule for the process and products delivery	Sponsors and meaningful stakeholders expanded	Risks that can threaten the project are identified, documented, analysed and evaluated; they can impact the Project Preliminary Plan.
Initiation	Project approval, RFP, SOW Contract, Project Instantiation, Resources assigned	Project Manager Project Team Buyer Represents. Developing Team RM Team	Risk of getting on contract (both sides)
Planning Phase (PP)	Modification and refining the project plans, Work Breakdown Structure (plus sometimes Product BS) Quality assurance, Change control and Configuration management plans Plans for the nearest phases	List of project stakeholders is detailed and responsibilities assigned; indirect stakeholders can be defined. Actual lists de-pend on the project phases like Design, Development, or Deployment)	The initial list of project risks is updated, new risks are identified. Risks and their impacts are analysed and evaluated; RM Plan and detailed mitigation plans are developed and integrated with the project plans.
Execution and Control	End of phase checklists and measurements executed; plans for oncoming phases are detailed, activities monitored, problems resolved, project plans updated, changes implemented	New stakeholders can arise Risk Advisory Council can be sometimes brought to existence	The planned actions are implemented; risks are monitored; correcting of the mitigating actions takes place
Project Closeout	Project evaluations Project Final Report		Evaluating and summarizing the RM activities

3. SODIS Process

Impacts that cause harm to a project's stakeholders are seen as *ethical risks*. SODIS as proposed by Gotterbarn and Rogerson [Got2001, GR2005] brings a systematic approach to software project ethical risk analysis, planning and mitigation techniques. The impact analysis is done through qualitative questions that are viewing a project from the stakeholders perspectives. The process runs in two steps:

- A Preliminary Analysis (PA) covers identifying the project context, risk-factors, and all project stakeholders with the tasks. For every stakeholder related to every task, potential issues are recorded and a list of required actions is completed;
- A SODIS Analysis (SA) states concerns and solutions to modify the project plan according to the identified potential risks. SA is run in a form of questions addressing professional and ethical project issues. An Inspection Process consisting an audit of SA results and clustering the identified concerns has been recently added.

SPA, Software Process Auditor, provides a tool that supports the process - its current version is developed by SIPL Pty Ltd from Australia.

3.2 Problems and remarks

PA and SA are not very closely aligned and what in fact follows the ISO [AS/NZS] standard suggests starting the RM process by establishing the project context. Hence, although PA results make a good starting point for SODIS analysis we think in some instances both PA and SA can be conducted alone (we know at least two experienced project managers who simply skip PA, seeing it as too time consuming). PA in particular should be much more adaptable to specific project needs and has much that is unnecessary or almost arbitrary and therefore its perceived usefulness is lessened in the eyes of those being asked to use it. This is problematic in gaining user acceptance as in reality there is much in the PA that is useful that may be hidden by the stuff that is not.

At the same time classification of projects follows their domains (business, education-nal, etc.) while the risks depend rather on project and system types (analytical, development, service, embedded, innovative, real-time, …);

Also, for a SODIS user it seems important *when* PA or PA are applied. Risk analysis is run along the whole PM cycle and is indispensable both in PP and IP phases. However, some aspects of preliminary and detail planning are mixed throughout PA and SA analysis – PA questions like *Is the project plan acceptable?* suggests that we are at the end of Preliminary Phase. But then there follow questions about agreement with a developer as well as clearly documented project testing, deployment, training and maintenance plans?

The problem is combined with the stakeholders' competence and responsibility. Stakeholders are linked to the project in a selected project context (like users - to exploitation phase). Next, would it be sensible to seek solutions to our concerns among, let's say, clients of a Project Proposer? How in practice can we gather concerns from a wider range of stakeholders? Should any stakeholder impact any solution? Boughton and Plotka [BP2011] point out that a project comprising 15 tasks for which 10 stakeholders are identified would lead to 4650 questions of SODIS analysis. Currently clustering of stakeholders can be done only during the Inspection Process or the problem lessened partially by adjusting the settings in the SPA tasks as not relevant to a particular stakeholder.

The next question is *who* does the analysis. The initial answer 'an Analyst' is somewhat misleading – an external Analyst? someone from the Buyer's side? or from the Developing team? Before the project initiation it has to be the Buyer, and after this should be the PM Team who would use the analysis to indicate a systematic approach to identifying ethical issues. However, it is an everyday practice for a Developer to establish his own plans – because of internal details that are not important to other parties, or a tendency to keep some project concerns confidential, not known to the other side - the latter can result f.e. either from low opinion of Sponsor's contribution, or the Developer's additional objectives, like educating the team members, maximizing profit, hiding temporary problems, etc. A similar situation can be seen on Buyer's side, f.i. when he finds out about the low competence of the Developer. Should we treat it as unethical and close our eyes or maybe – assist in coordinating the schedules?

It could be that the ideal would be for analysis to be completed by both the Buyer's and the Developer's side. However, whilst it would almost certainly enable greater identification of ethical issues, there is the problem that each would approach the analysis in a different way, with a different

set of criteria, requirements and expectations. This means that sharing the findings of the analysis may create problems within the PM process and delay progress.

Furthermore, the SPA tool allows for importing tasks from the Gantt chart. Then, analysis-born actions and solutions are able to be mapped to the project work breakdown structure. However, deciding on alternative solutions, clustering them, and mapping the resulting tasks to WBS are not supported, while for a project manager such a "hard result" would be greatly appreciated.

Last but not least, as PA and SA should be better prepared for iterations (though [BP] names SODIS Inspection *iterative SODIS Analysis* it seems oriented to clustering risks, not for being re-visited).

4. Improvements and suggestions

Risk management is part of what SODIS does, however what is missed is the ability that SODIS has to actually support PM – in particular during the planning stages.

4.1 SODIS viewpoints

Some suggestions are of the more general character:

- the future iterations of SODIS could strengthen the PM elements through the decomposition of PA and SA features along the PM line;
- SPA (SODIS?) allows project types, like f.e. *Business, Educational, Scientific,* or *Real-time*. Questions and concerns should be adjusted to these types as risks differ for, let's say, development, innovative, or service projects;
- there should be questions adjusted to different project strategies (waterfall, incremental, prototyping, RUP, agile,..) and their related task-grouping stages. This sounds reasonable – as tasks differ, and risks and risk factors have their *range (context)* linking them with project stages, like f.e. poor specification is tied mainly to requirements analysis, while users' dissatisfaction to exploitation phase.
- There was a suggestion put in [Sze2002] to predefine project stages following [MR1990] as *Concept* (*Planning*), *Design, Development* and *Deployment* ones – probably this could be done more flexibly and the stages 'imported' from the Preliminary Plan;
- in parallel we need an abstract, of different levels, fitted to the project stages, view of project stakeholders – so at the beginning we can easily refer to 'generic' roles, like *user, public, client* or *the environment*... as used in SODIS questions, thus detailing the roles throughout the planning process (f.e. expanding the Developer to an Analyst, two Programmers and a Tester for a waterfall development, or to two Designers when an agile approach is decided). This satisfies both Preliminary and Project Planning needs, allows refraining based on stakeholders' competence and responsibility and leads to not-so-many questions in analysis. The huge number of questions generated where projects have many stakeholders, and the apparent repetition of those questions, albeit with an emphasis on each stakeholder means that in some cases, the time needed to complete the analysis is such that project managers may not consider that their resources are being used wisely. Therefore, any reduction in number of questions in PA which does not compromise the integrity of the analysis should be welcomed into any development of the SODIS approach.
- There are *stakeholder categories* introduced in SPA that can be instantiated in succeeding phases, still the mechanism does not seem flexible enough. We could probably adapt the approach proposed in [MG2004] – the Authors refine RUP Stakeholder role from *Any Role* at the most general level, through *Role Sets (Analyst, Developer, Tester, Manager, Support Staff, External Stakeholder)* at the framework level, to *Detailed Roles* at the intermediary and detailed level (for instance, in their 'educational system' they extended *Support Staff role* to *Course Developer, Graphic Artist, System Administrator, Technical Writer* and *Tool Specialist*). Following the idea, a hierarchy seen as 'SODIS stakeholder' could be proposed...

4.2 Suggestions in PA improvements

Just several improvements within the PA part could lead to evaluating if the IP phase is completed or requires more activity:

- the questions could take The Buyer's viewpoint and refer to the IP objectives, f.i. *Has a development team been formed?* could be replaced with *Has the Buyer's Project Team been formed?*;
- irrelevant questions, like Is there a thorough, written agreement with the Developer? or Does Task have an adequate test plan? should be moved to the PP phase;
- questions that compete the IP phase, like Are risks that threaten the project identified/documented/analysed? or Does project strategy take risk/quality politics into consideration? should be introduced. Though this can be achieved with SPA options some questions should be added as predefined and obligatory for the phase;
- PA could be re-visited during the IP Phase thus helping in verification of project completeness;
- during the Planning Phase the previously skipped questions referring to the Initiation Phase, like *Have the developers' references been checked and found acceptable?* could be brought back;
- PA should be aimed at stating the project completeness at the beginning of the planning process;
- PA reports need reviewing – all required actions could be listed by project phases as well as a summary report that matches the Project Initial Plan Document following a given framework produced.

4.3 SODIS Analysis

- Planning, RM processes and our knowledge of system solutions deepen iteratively – SA must be prepared to be re-visited. Thus the supporting tool should enable managing the concerns and their solutions - adding new ones, removing those already resolved, changing their criticality etc.;
- there should be a possibility to group stakeholders aiming the analysis – the suggested model of 'SODIS Stakeholder' can be of the great use;
- the same deals with project stages – the analysis should be possible for a given stage or sequence of stages;
- SA reports should be made more constructive; especially all tasks or activities seen as solutions to the identified concerns ought to be reported by project phases;
- Solutions should also be included within the SA reports, perhaps as a part of the Concerns detail by task report.
- To support planning and risk mitigation we should map the identified solutions to project activities (i.e. tasks that result from solutions of concerns should become elements of project's WBS). Thus we need importing the schedule, modifying it with mitigation actions, then presenting and/or exporting it. To ease the latter
    - clustering conclusions is required,
    - SPA could be extended to produce and export such modified structures (as SPA allowed importing project WBS from MS Project, in [RS2005] we announced such a prototype for the older version of the SPA tool). In general, it seems feasible with f.i. XML structures;
- to ease operating separate schedules by PM Team and Developer or Buyer teams

- grouping the stakeholders can be once more useful. One can discuss and modify tasks of each team while the decisions are kept to their managers. And as each group has its own task structure it could be modified separately though in the context of other changes;
- to keep the task structures consistent, selected points or milestones in Team WBS could be marked – and a mechanism for checking consistency of Team and Developer/Buyer workplans at these points could be introduced.

5. Summary

The paper reports some problems in practical use of SODIS impact analysis and brings suggestions in its improvement, in particular by integrating the process with the project management. The authors hope that at least some of the suggestions can make a real improvement to the SODIS approach thus bringing it to gain wider acceptance.

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TO BEAR THE UNBEARABLE: COLLEGE-LEVEL INFORMATION ETHICS EDUCATION INCORPORATING DISCUSSIONS OF ETHICAL DILEMMAS

Takeo Tatsumi, Yoshiaki Nakano, Noriaki Kusumoto, Joji Maeno and Yasunari Harada

Abstract
We first report on the results of a questionnaire survey conducted to first-year students attending five different universities in Japan regarding their experiences of computer ethics education. The students had studied information ethics as part of compulsory subjects in K-12 schools. The students tended to have lost interests in studying anything more about information ethics at university. This is part of the reasons why they cannot acquire intended goals of "Information Studies". Their knowledge and abilities are insufficient for proper utilization of ICT in daily life. To improve their learning experiences, we advocate incorporation of discussions on topics that constitute dilemma pertaining to network communication or copyright issues. After trial lessons incorporating such activities, we confirmed that the students' motivation for learning significantly improved.

Keywords
Computer Literacy Education, 21st Century Skills, Dilemma.

1. Introduction: Why Computer Ethics Education Matters?

More than a decade has passed since the somewhat misleading term “Computer Ethics/Morals Education” came to be widely known among Japanese educators. [Tatsumi(1998)] In this paper, we will first show that computer ethics education in K-12 classes and university courses in Japan mostly consists of memorizing (i) obligations on the part of users according to what are specified in laws, rules and regulations, (ii) preventive measures against fraud and scams, and (iii) tips on proper settings and configurations and usages for computers and software tools. Such approaches do not provide students with sufficient learning opportunities for growing up to be independent and self-reliant computer users as new types of computers and other programmable communication devices emerge in the market continuously, each of which brings up renewed ethical issues and computer security vulnerabilities. Japanese teachers in general expect a new teaching material for each new incident and crime. On the other hand, the authors believe that in learning computer ethics, ethical topics such as morals, Utilitarianism, and the Golden rule are essential and inevitable and computer ethics education must involve topics on computer science and ethical dilemma, because the basics of computer science and foundational issues of ethical dilemma do not change rapidly even in this decade.

In this paper, we will discuss rationale for Information Ethics courses that incorporate discussions and decision making among students on real-life real-time issues surrounding ICT and discuss details of some of the classes conducted by the authors, with some indications of the relative effectiveness of these pedagogical approaches.

2. Background - Computer Ethics Education in Japan

Many undergraduate departments and programs across academic fields of study in Japan offer introductory computer literacy courses for newly entering college students. These often include instructions on how to type, how to operate standard word processing and spread sheet software and some discussions on the privacy, copyright and other ethical and/or legal issues related to everyday use of computer networks.[Harada(2002)]

2.1 Computer Ethics in K-12 – University Education in Japan

Very often, both the instructors and the students are bored to death when they go over this "information ethics" section of the course material. Studies including some of our own have indicated that many university students have completely lost their interests and motivation for learning anything more about "Information Ethics" as they enter college. Here is a summary of a questionnaire given to universities students.(N=1266, Apr 2012)

Q1: Which topics did you learn at high school? (Higher topics)

Table 4 : acquired topics

Topic	%
treatment of personal data	57
copyright issues	54
manner and morals of e-mail	44

Q2: Which topics do you want to learn more about at the university? (Lower topics)

Table 5 : interested topics

Topic	%
treatment of personal data	13
media literacy	11
copyright issue	9

Part of the reasons for this apathy is that in elementary and secondary schools, those students have already been exposed to "Information Moral Education" with excessive and ineffective dosages of "Safety Education" and "Crime Prevention Education" that enumerate "dos and don'ts" of computer network usage. On the other hand, the authors strongly believe that despite those adverse conditions, it is imperative that those college first-year students receive meaningful and effective Information Ethics Education and deepen their understanding and appreciation of the rapidly changing information technology, because it is one of the most essential knowledge that college students should be endowed with today.

2.2 Three factors to Information Ethics

In order to envision a more effective Information Ethics 101 course in Japan, we need to consider three factors.

The typical teaching style in Japanese schools makes students lose motivation.

The main reason that most students have lost motivation for learning these issues by the time they enter college is that in earlier stages, the typical teaching style is that of the teacher telling students what to do and what not to do and having them memorize the names of the laws, rules and regulations that may or may not be relevant to the issues at hand. There is no sense of involvement, urgency or immediacy in those approaches on the part of the learners.

Critical thinking is not common in Japanese K-12/university education.

Second, the students are not allowed to consider various alternatives and evaluate relevant factors from diverse perspectives. In other words, students are not allowed to think critically and make their own decisions. This will not help students to form their own ideas and opinions, even in situations where similar incidents have recurred many times within a decade or so, once some minor details of technology is new or in a new disguise. The development of information technology requires exactly those critical thinking skills, because what may not be true yesterday is no longer so today and what is a valid appraisal today would not be so tomorrow in this ever changing world of technology.

Discussion is not encouraged in Japanese traditional education.

Third, in traditional secondary education classes, students are not allowed to interact with other students to exchange ideas and opinions or discuss and arrive at some mutual consensus. Collaboration and discussion on interdisciplinary issues is a widely spreading learning style at elementary schools and at colleges even in Japan, but most Japanese high schools still consider traditional knowledge-based teaching of subject-matter contents to be most effective in delivering the most important part of their education.

3. Incorporating Dilemma Discussion to University Education

In this section, we describe prior researches and two of our own practices.

3.1 Prior Researches

Yaoko *et. al.* [Yaoko(2011)] reported the effectiveness of "computer ethics drills" consisting of computer security, copyright, e-mail and password not only for high school students but also for students' parents in understanding "what is allowed and what is not allowed." But those drills do not incorporate discussions of dilemma.

Morimune *et. al.* [Morimune(2011)] reported the effectiveness of class session at his high school in which students thought of copyright issues not as consumers but as creators. In this report, copyright laws are considered as given. Student were not allowed to consider alternatives to the existing laws.

Abe [Abe(2010)] pointed out that "information morals education" at K-12 in Japan lacked those aspects relating to the responsibility of creators. Abe, however, did not incorporate dilemma problems.

Hayashi [Hayashi(2005)] reported that the effectiveness of her educational material based on the theory of "Stages of Moral Development" by Lawrence Kohlberg. The research covered only dilemmas of morals and law and has not referred to the role of computer technologies and security issues.

Igarashi [Igarashi(2006)] proposed three categories of computer ethics education at senior high schools. The first category is knowledge. The second category includes ethical issues, privacy, copyright, harmful information, and computer securities. The third category includes due diligence among amateur radio enthusiasts or a Linux contributors. Igarashi, referring to Hayashi's work, proposed what teachers should think in "computer ethics classes." Hayashi's proposals, however, were not based on practice but based on his ideas.

Tanaka [Tanaka(2011)], referring a trade-off model between the freedom of expression and infringes on the moral rights, proposed that teachers should deal with "the right of portrait", "spoofing", "the law on restrictions on the liability for damages of specified telecommunications service providers and right to disclosure of identity information of the sender", and "damage to credit." This proposal was based on judicial precedents. Japanese senior high school student, however, may not be able to learn such topics because there is no class beyond the constitutions or copyright issue in schools. Tanaka's proposal is suitable for university students.

Inagaki, *et. al* [Inagaki(2012)] reported that an evaluation of experiments in his classes of introductory computer literacy incorporating four types of typical stories including dilemma. He evaluated, with Kohlberg's stages, the divergences of stages in students' essays by four types separately. According to his paper, larger divergence appeared in dilemma topics lacking the rigidness of related laws and involving many types of discussions about information communication.

3.2 In the Computer Education

In an introductory computer literacy course taught by one of the authors, students are asked to engage in discussions on various real-life issues relating to moral and/or ethical dilemma involving copyright, privacy and security.

Whom, what, and when

In May 2012, 80 freshmen answered our questionnaire before and after learning issues involving computer security dilemma. This class consists of two sessions.

Questionnaire paper (Likert 4-point scale)

If you are to attend a 90-minute session on [this topic], how do you feel about it? Choose one from among the four given below.

1. strongly willing / 2. willing / 3. unwilling / 4. strongly unwilling

(Items of questions will be listed in Table 2)

The first session

In the first session, we conducted the first questionnaire with two topics. In the first half of the session, the teacher showed a number of technical aspects of computer viral infection. It is natural to deal with those issues in an introductory computer literacy and computer science course. In this session, students learned differences between right and wrong choices in using computers and networks.

In the latter half of this session, the teacher gave copies of a newspaper article of a 92 old WW2 veteran who is making numerous illegal duplicates of Hollywood movie DVDs and sending them to US troops in Iraq and Afghanistan[New York Times (2012)]. After this presentation, the teacher started the discussion freely. Students thought that making those copies is illegal but giving soldiers outside US ways to feel at home is a good conduct. They thought of what conduct is good and what conduct is legal. As many of them didn't know how to think of a dilemma, they seemed quite confused in their discussions. Some students, however, found that we have some trade-off-relation in this situation.

The second session in the following week

In the second session of this class in the following week, the teacher informed the students that, in some countries, a complaint is necessary for prosecuting someone for copyright infringement. In the case discussed above, if the copyright holders such as production companies sued the benevolent veteran, those companies might be run the risk of being considered anti-American and may risk commercial damage. For those companies issuing complaint may involve greater commercial loss than ignoring this copyright infringement. The teacher goes on to show the students that such dilemma can be analyzed with our original two dimensional X-Y model of a dilemma.

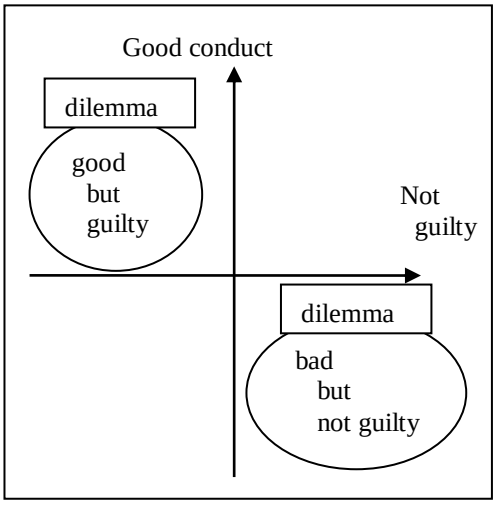

Figure 1. two dimensional X-Y model of a dilemma

The teacher showed a different example [World Hunger Education Service (2003)] for discussion regarding legitimacy of unlicensed production of patented HIV-suppressant medication in developing countries. Another topic [The Korea Times (2012)] is fabrication of experimental data under extreme social and organizational pressure to publish. After students learned the framework of two dimensional X-Y model of a dilemma, it was not difficult for students to think of discussions about

another dilemma. Although students often immediately see what is "right" in terms of laws, rules and regulations, further discussions led them to understand that there are more to the issue than meets the legal eyes, and in view of higher ethics, what is legally right may not always be the proper solution.

At the end of the second session, we took place the second questionnaire.

Evaluating Questionnaires (results)

Here are the scores of students' motivation on a 4-point scale according to topics after the second session and the differences pre- and post-sessions. (1 is the lowest and 4 is the highest score.)

According to the questionnaire results, the students' motivation increased. It should be noted that the students indicated much more willingness to learn topics concerning computer ethics while interests to learn topics concerning PC security did not decrease. (However, the score for phishing is down. We do not have a clear explanation why this is so.)

Table 6 : the average scores (after) and the differences before and after (N=80)

No.	Items	Av. score(after)	difference
1	Morals	2.48	0.36
2	ethics and dilemma	2.49	0.28
3	basic human rights	2.10	0.32
4	penal law	2.79	0.32
5	civil code	2.68	0.40
6	personal information protection law	2.59	0.27
7	copyright law	2.65	-0.02
8	updating PC's OS	2.69	-0.11
9	installing anti-virus software	2.63	-0.07
10	protection of smart phone to malwares	2.96	0.01
11	phishing protection	2.64	-0.38
12	exposure of illegal activities on twitter	2.58	0.14
13	preventing personal information	2.86	-0.04
14	dangerous software such as P2P software	2.91	0.01
15	discussion using web BBS and chat	2.41	-0.01

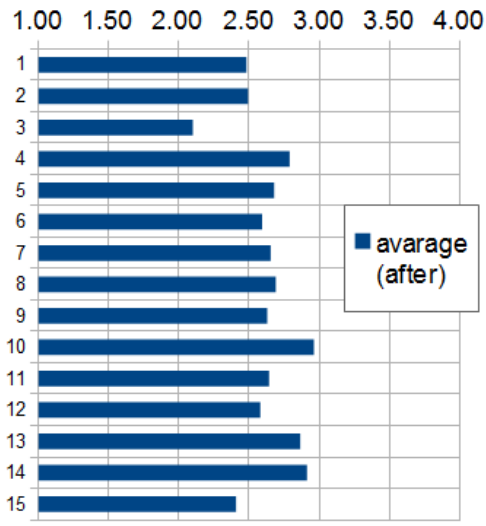

Figure 2: average of score (after)

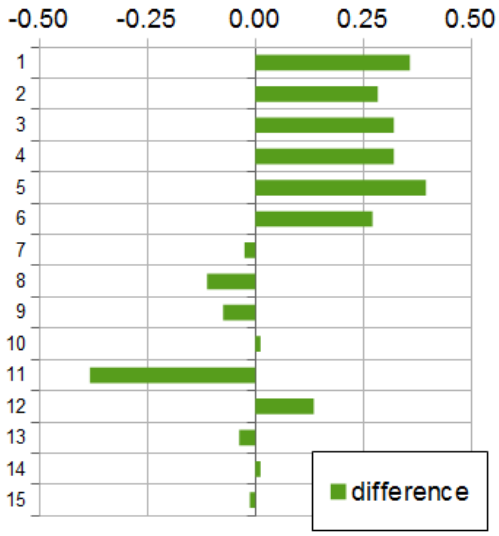

Figure 3: difference

3.3 Foreign Language Classes at PC Lab

Computer education and language education in Japanese universities have a lot in common. Specifically, we note that the principal objectives English language education in Japanese universities can be summarized into the following three.

1. improvement of students' English language proficiency, especially in terms of productive skills and interactive skills
2. enhancement of students general academic skills, especially in terms of their presentation skills, academic writing skills, their use of academic resources such as library and network and their project coordination skills
3. their general communicative capacity, especially their general readiness for group activity and spontaneous construction of small groups

In order to achieve these goals, one of the authors conduct his English classes for the first-year students based around the activity called "oral interaction practices" in which students are organized into groups of three (or two when the total number is not exact multiples of three). For each session, ten questions pertaining to one particular topic are prepared in advance and printed on business-card size pieces of paper. Each of the three students in one group is assigned one of the following roles; the questioner, the respondent and the time-keeper. The questioner picks up one of the ten question cards and reads the question aloud to the respondent twice. The respondent has ten seconds to think and formulate the answer and 45 seconds to speak whatever comes to her/his mind. The time-keeper prompts the respondent by saying “Start!” ten seconds after the question is read the second time, and says “Stop!” 45 seconds later. After the response is given, the questioner and the time-keeper give a score to the response based on a rubric given to the students and write the score onto a peer-review sheet for the respondent. Then, the three students change their respective roles and go on to the next question. Usually, 20 to 25 minutes are devoted to this activity in a session of 90 minutes and students go on to start writing a 500-word essay on the topic in odd-numbered sessions or peer-review the essays written a week earlier by five of their classmates in even-numbered sessions.

At the beginning of the school year, the topics are relatively simple. In the first week, the students ask each other where they came from and what their reasons are for entering this particular university or department. Later in the semester and in the second semester, students begin to feel that the questions are almost impossible to answer even if they are given in their native language and they are answering in Japanese. One interesting question is regarding construction of nuclear power plants. Until around 2007, students generally expressed undefined fear or reluctance but 2008 through 2010, more and more students started to say that nuclear energy is “clean” and “green.” Then we experienced the earthquakes and tsunamis on March 11th 2011 and the subsequent nuclear power plant “accidents” in Fukushima prefecture. Another series of questions used every year concerns issues related to digital duplication of music, video and computer software. Students seem to believe that duplicating music is OK but duplicating music is not good. Students generally do not have clear ideas about why some software materials are distributed “free.” Talking about these issues provides the students a good introduction to a more systematic and extensive discussion and research in the next school year.

4. Conclusion

We reported our findings based on the results of a questionnaire survey we conducted to first-year students attending five different universities regarding their experiences of computer ethics education. After K-12 experiences, the students had lost interests in studying anything more about information ethics when they enter universities and the students’ understanding and abilities are insufficient for proper utilization of ICT in daily life. To improve their learning experiences, we incorporated discussion topics that constitute dilemma pertaining to network communication or copyright issues. After lessons incorporating such activities, we confirmed that the students' motivation significantly improved.

It is important to recognize that these courses in computer literacy and foreign language will contribute in fostering various 21st century skills for communication, collaboration, creativity, and critical thinking. By exchanging ideas and coming up with some mutually agreeable conclusions, the students acquire skills for communication and collaboration. They learn to be creative for coming up with new ideas and perspectives when confronted with moral dilemma. They learn to think critically for weighing different ideas and views. They learn general academic literacy for giving formal presentations based on their own ideas and judgments and writing and editing skills for essays based on those presentations.

This is extremely important in societal background of Japan, as most adults and students and children consider our legal systems as given and fail to understand that laws and regulations and international conventions are formed through negotiations of various stakeholders, and what is considered as a general agreement may not reflect the maximal good of the maximal population of the world, only reflecting the good for the very powerful and the very rich.

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RESPONSIBLE RESEARCH AND INNOVATION A TECHNOLOGICAL FIX? A CRITICAL REVIEW OF MOTIVATIONS BEHIND RRI.

Job Timmermans

Keywords
ICT, technological fix, Responsible Research and Innovation, RRI

1. Introduction

'If I were to be asked who has given the world a more effective means of achieving peace, our great religious leaders who urge men to love their neighbors and, thus, avoid fights, or our weapons technologists who simply present men with no rational alternative to peace, I would vote for the weapons technologist.' Alvin Weinberg in his acceptance speech for the University of Chicago Alumni Award,(Weinberg 1967).

With this provocative statement Alvin Weinberg, a leading scientist who worked at the Oak Ridge National Laboratory during the Manhattan Project and an advocate for nuclear power, made a plea to invest public funds in technological research dedicated to solve social problems. Technologists, he argued, are better equipped to fix social problems than social scientists, hence the term technological fix (Weinberg 1967). Over time, instead of the positive connotation attached to it by Weinberg, technological fix more and more was associated with a diametrically opposed position(Rosner 2004). Technology fix then became a way of critiquing an unwarranted reliance on technology to solve complex social problems(Scott 2011).

Some fifty years after Weinberg made his plea, a discourse emerged in which analogue ideas and motivations are at the centre. Acknowledging the huge impact of technologies on society, the idea took hold that the consequences of Research and Innovation (R&I), both positive and negative, should not be left to chance (Owen et al. 2013). Therefore efforts need to be undertaken to govern R&I towards achieving societal desirable outcomes and market products (Von Schomberg 2012). To this purpose different approaches and theories are aligned and integrated under the umbrella term Responsible Research and Innovation (RRI) (Grunwald 2011). RRI also got picked up by policymakers across Europe. They view technology as an enabler of smart, sustainable and inclusive growth (Stahl 2011). The European Commission, through the voice of European Commissioner for Research, Innovation and Science Màire Geoghegan-Quinn, puts forward an ambitious agenda for researchers and innovation (Geoghegan-Quinn 2012). Mirroring Weinberg's plea, this agenda positions R&I at the locus of resolving the serious and urgent social problems faced today ranging from environmental issues to the economic crises.

As the overarching goals aimed for by RRI carry over to its further theorizing and practical application, it is important that these goals are grounded and justified. Building on apparent similarities between technology fix and RRI, criticisms of technology fix can be used to review current discourse on RRI. Critical analysis helps to surface possible weaknesses and omissions in the assumptions and reasons for doing RRI. Addressing these may in turn contribute further development of RRI by providing it with a more justified and therefore more realistic outlook. Not in the least by lessening expectations of what realistically can be expected from technological innovation to fix social problems.

First the concept of technological fix is outlined together with an overview of its main criticisms. Second, a parallel is drawn between RRI and technological fix in order to extract similarities between the two concepts. Third the criticisms of technological fix are used to discuss motivations behind RRI forwarded in current discourse. The contribution finished with some concluding remarks.

2. Technological Fix

Technological fix often is viewed as instance of technological optimism found abound in Western societies (Rosner 2004; Gillespie 2007). This optimism consists of a belief that sciencebased technology empowers us to control and alter the physical world. Moreover, technological solutions are believed to be less painful than solutions that require political and social change (Volti 2009). Paradoxically this faith is not hampered by preceding technologies that were unable to fulfil their promises (Gillespie 2007). James Carey (1989) for instance notes that electricity promised freedom, decentralisation, ecological harmony, and democratic community (Carey 1989 as cited in Gillespie 2007), much as was attributed to the Internet when it first emerged.

Weinberg dubbed himself 'king of technological optimism'(Rosner 2004). In his optimism he advocated 'cheap technological fixes' that afford shortcuts to resolution of social problems (Weinberg 1967). Technology as a way to fix social problems is contrasted with social engineering which aim is 'to invent the social devices - usually legal, but also moral and educational and organizational — that will change each person's motivation and redirect his activities along ways that are more acceptable to the society.' (Weinberg 1967) Technology then would be able to solve social problems without going to trouble of changing individual social attitudes. For instance, instead of changing people's driving habits to prevent traffic accidents from happening, it is much easier and quicker to invent safer cars.

In his talk Weinberg sets some examples, which in hindsight would not be regarded cheap fix at all. Nuclear energy for example did offer cheap energy, but not to the extent Weinberg thought it would be. What is more, over time nuclear energy involved many negative consequences ignored or unforeseen by Weinberg, such as the problem of nuclear waste storage and occurrence of nuclear distastes such as recently in Fukushima.

Already in the 1960s, when Weinberg had just published them, his views were met with disagreement(Rosner 2004). Not only were the proposed fixes regarded ill-considered and misplaced, also the concept of technological fix as such was criticised. Over time technological fix more and more became associated with these criticisms. As a result it turned out to be used predominantly in a wholly negative or ironic sense (Rosner 2004). The main criticisms to technological fix discussed in literature are:

First, technological fixes conceive social issues in too narrow engineering or technological terms (Burke 1969; Rosner 2004; Scott 2011; Sarewitz and Nelson 2008).

Second and related to the first criticism, technological fixes are reductionist responses to complex problems therefore omitting to take into account their interdependence and wider context (Rosner 2004; Huesemann and Huesemann 2011). As a result they only provide a one dimensional outlook were an 'ecological, holistic approach' is warranted.

Third, technological fixes falsely suggest that all or most social problems are capable of a technological fix (Burke 1969). A whole range of problems cannot simply be resolved through technology 'however sophisticated the design or however well versed in science and mathematics the engineers.' (Rosner 2004)

Fourth, trying to solve problems with technology might distract attention from the true solutions (Burke 1969; Rosner 2004). For instance, because problems were created by technological advances it is often deemed reasonable to look to technological advances to solve these problems thereby omitting other possible ways of solving them(Rosner 2004; Huesemann and Huesemann 2011). Moreover, as Weinberg also noted, in many instances it is easier to ask technologists to solve social problems than it is to ask people to change their behaviour (Huesemann and Huesemann 2011). Again, this results in quick fixes being favoured over addressing the real issues.

Fifth, technological fixes often do not offer real solutions because they only attack symptoms, but not root out causes (Weinberg 1967; Rosner 2004). Consequently they momentarily forgo the much harder questions at the core of the problem (Gillespie 2007). At best they then buy us time to address the real issues (Huesemann and Huesemann 2011).

Sixth, inherent to technological innovation technological fixes involve unforeseen and possibly negative consequences that may be worse than the social problem they intended to solve in the first place (Maasen 2010; Huesemann and Huesemann 2011; Weinberg 1967).

Seventh, technological fixes help abrogate, i.e. put aside, responsibility of people involved in the social problem as well as of the designers of technology involved in the fix (Gillespie 2007). The burden of addressing social issues then shifts to technologists. The technologists however do not address the social problem as such, but solve the technological challenges derived from the social problem.

To be clear, Weinberg was not blind to these criticisms. Some of the counter arguments to a technological fix of social problems already were suggested by Weinberg. Besides, his use of arguments can be interpreted as debating tactics persuading politicians to invest money in technological research (Rosner 2004). At the time of writing enormous amounts of money were invested by the US in its space program. Weinberg proposed investing part of that money into other technological projects aimed at solving social problems (Weinberg 1967). Furthermore, Weinberg nuanced his position by stating that despite the importance of technology the 'social engineer' always comes first. Technology however does provide broader options to the social engineer (Weinberg 1967). It is therefore paramount that social engineers and technologist should work together.

Before discussing to what extent the criticisms of technology fix apply to RRI, first parallels between the two concepts are drawn.

3. Parallels RRI and Technological Fix

Although RRI has come to receive broader attention only recently, the development of RRI stretches back at least a decade(Owen et al. 2013; Owen, Macnaghten, and Stilgoe 2012; Grunwald 2011; Von Schomberg 2011). RRI is often regarded as a next evolutionary step in a longer tradition building on developments in related fields and practises that have a longer history such as Technology Assessment (TA), social-technical integration and science and technology studies(Owen et al. 2013). The phrase RRI itself stems from two earlier terms 'responsible development' and 'responsible innovation' that have been part of the discourses on scientific-technological advance and products, services and systems respectively (Grunwald 2011).

A widely cited definition of RRI defines it as ´a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products(in order to allow a proper embedding of scientific and technological advances in our society).' (Von Schomberg 2012) Resembling technology fix this definition suggests a prominent role for R&I in attaining social goals. To analyse similarities between the concepts in more depth, arguments supporting RRI from current literature are compared to the characteristics of technological fix.

First, just as technological fix, RRI has technological optimism as its core assumption. Central to the argument stated in literature why RRI should be pursued is the need to steer and anticipate the consequences of R&I. Consequences of R&I are expected to be disruptive (Sutcliffe 2011) or transformative for society (Owen et al. 2013), and occur at intergenerational (Owen et al. 2013; Groves 2006)and global scales (Sutcliffe 2011; Stahl 2012; Owen et al. 2013; Lee and Petts 2013). It is therefore paramount that negative consequences of R&I, are prevented or mitigated (Sutcliffe 2011; Mason 2012). Learning from past experiences with asbestos, Genetically Modified (GM) crops and Nanotechnology it is uncontroversial among politicians, businesses and the public alike that preventing adverse or catastrophic effects should be at the forefront of R&I (European Commission 2011a; Sutcliffe 2011; Lee and Petts 2013).

Towards potential positive consequences of R&I a more progressive stance is taking hold in RRI discourse. It is argued that R&I not only should prevent adverse consequences but should intently target positive consequences. In the Europe 2020 Strategy, for instance, R&I are set centre stage as way to overcome the current economic crisis and to create a smarter, greener economy (Geoghegan-

Quinn 2012; Owen, Macnaghten, and Stilgoe 2012). Moreover, advocating RRI, it is proposed R&I process and outcomes should align with the values, needs and ambitions, and expectations of European Society(Geoghegan-Quinn 2012).

RRI thus shows positive overtones towards possibilities to attain societal goals (Owen et al. 2013). Moreover it implies that with respect to R&I, a capacity exists towards achieving societal desirable goals. The belief of attaining societal (or social) goals through steering R&I closely mirrors the core assumption behind technological optimism namely the belief in the ability to control physical world and to fashion it according to our ideals. Furthermore, the explicit focus of RRI on social values as requirements or aims of R&I also is aimed for by technological fix. Weinberg for instance implied that nuclear energy will enhance equality as energy prices would drop to a level that it will be attainable for everybody.

Another argument why RRI should be pursued is that it provides a way to legitimize spending of tax-payers money on EU and government-funded research programmes (Sutcliffe 2011; Von Schomberg 2012; Owen, Macnaghten, and Stilgoe 2012). Huge amounts of public money are spent to fund research and innovation every year. The argument therefore can be made that publicly funded research should be prevented from producing adverse societal consequences at minimum, but preferably should produce consequences that align to societal needs. This is seconded by public consultations in emerging fields of R&I which revealed a strong public desire 'for scientists (and those that fund them) to actively take more responsibility for the wider implications of their research' (Owen et al. 2013; Macnaghten and Sykes 2013).

Justifying expenditure of tax-payers money also was implied by Weinberg when he suggested that the vast amount of public funds invested in R&I by the US government should be targeted at solving social problems. Again, the underlying belief is present that R&I are able to make a difference and thereby justifies spending tax money on R&I.

Third, Weinberg plea for pursuing technological fixes suggests that at the time of writing R&I efforts were not (yet) intently targeted at solving social problems. Whereas R&I efforts may have a contribution to solving social problems implicitly, technological fix seems to suggest they should do so with explicit and specific intensions to do so. Similarly in current discourse on RRI, existing legislation and governance approaches are criticized for their lack of intentional alignment to social aims.

Existing regulation, for example, is regarded as insufficiently capable to deal with (novel) R&I and their produces adequately(Owen et al. 2013; Stahl 2012). Characteristics of R&I such as their time lag between conception and introduction, speed, global scale and complexity in combination with the uncertainty and disruptive nature of their impact, contribute to an 'overflowing [of] the boundaries of existing regulatory framework (Callon et al 2010 in Owen et al. 2013). Moreover, regulation currently predominantly uses knowledge and risk based models of regulation which do not suit the inherent uncertainty of the consequences of R&I (Bessant 2013; Owen et al. 2013). Therefore developing alternatives which take uncertainty and ignorance into account is seen as a central challenge for RRI(Owen et al. 2013; Lee and Petts 2013).

The same is argued for governance of R&I. Processes of governance lack reflection on the purposes and motivations of R&I which are needed to deal with challenges that their produces pose towards the future(Lee and Petts 2013). Due to inefficiencies and failures of regulation by market choice, for instance, liberal economies fail to deal with externalities associated with innovation(Lee and Petts 2013; Owen et al. 2013). Traditionally this was answered by governing the producers of R&I after they were introduced to the market. This backward looking, evidence based governance and regulation is perceived to be inadequate to secure societal desirable outcomes and prevent undesirable ones from happening(Owen et al. 2013).

Both existing regulation and governance are outlined as failing to align R&I efforts to social goals. While much more articulated than Weinberg in his plea, the requirements set to governance and regulation as suggested in RRI discourse do share an underlying current of intently steering R&I towards social goals. Moreover, both accounts suggest that current approaches in R&I practise do not suffice in steering R&I towards the right direction.

Finally, both Weinberg and the contributors to the RRI discourse suggest a close collaboration between technologists and social scientists as a necessary means to achieve social goals through R&I. RRI, for example, is represented as a necessary interdisciplinary endeavour integrating a broad range of disciplines such as 'innovation practice, engineering ethics, technology assessment, governance research and social sciences (STS)(Grunwald 2011; Owen et al. 2013; Jacob et al. 2013; Von Schomberg 2011). Also, 'Midstream modulation' is suggested as a way to implement RRI in R&I practise. Midstream modulation seeks to embed social scientists in research practices to allow them to engage natural scientists (Fisher and Rip 2013; Owen and Goldberg 2010). The requirement set by Weinberg to incorporate both social and technical sciences in technological fix is thus also generally accepted among RRI discourse.

Together the similarities between RRI and technological fix sketched here seem to substantiate the claim that RRI can be regarded as an attempt to fix social problems using technology. The question then arises how RRI answers to the criticisms that have been formulated to technological fix? In the next section this question will be addressed by reviewing arguments found in current discourse on RRI in light of the criticisms of technological fix.

4. Criticism of technology fix and RRI

The first argument against technological fix is that it conceives social issues in too narrow technological terms. Any approach that aims at addressing social issues using R&I is prone to this criticism, RRI being no exception. In current literature on RRI this risk is acknowledged and suggestions are made that must circumvent conceptual narrowing of issues most notably through stakeholder participation. Including stakeholders at all stages of the R&I process must ensure that social issues and other concerns of stakeholders are not overlooked or ignored(Geoghegan-Quinn 2012; Stahl, Eden, and Jirotka 2013; Jacob et al. 2013; Von Schomberg 2012; Owen et al. 2013) (Quinn, stahl, 2013, experts, schomberg, owen). By being inclusive and participatory RRI broadens the conception and discussion of R&I and its (desired) outcomes(Geoghegan-Quinn 2012; Owen et al. 2013; Sutcliffe 2011).

The second criticism states that technology fixes are reductionist thereby omitting to take interdependence and interwovenness to context and other issues into account. Although it can be argued that in modern science reductionism is less manifest than it used to be for instance in the age of Newtonian physics, reductionism still is part of many scientific methods. In disciplines ranging from hard sciences such as chemistry, physics to softer ones such as economy and sociology the use of (computer) models and thus a form reduction is general practise. Awareness of the limits of modelling reality today may be generally understood among scientists, the risk of 'reductionist ignorance' still is conceivable as R&I is fragmented and specialist. RRI seeks to address this fragmentation by stakeholder participation, but also by making R&I a more interdisciplinary endeavour(European Commission 2011b; Grunwald 2011; Sutcliffe 2011). For instance, in order for research projects to get funded, The Netherlands Responsible Innovation Project (MVI) required that projects be 'interdisciplinary, involving collaboration between researchers in such diverse fields as fields as ethics, social science, law, economics, applied science and engineering' (Sutcliffe 2011).

The third criticism counters the idea that a technology fix is able to address all social problems. This criticism certainly carries over to RRI. In current accounts of RRI a broad range of issues and categories of issues are outlined that in R&I should be contributing to solving. Besides aiming at what is deemed societal desirable or valued in general(Owen et al. 2013; Von Schomberg 2012; Sutcliffe 2011; Jacob et al. 2013), it is suggested that R&I should address gender equality, fundamental rights, ethical standards, economical growth (Geoghegan-Quinn 2012), normative anchor points set in the treaty of the EU, sustainable development(Von Schomberg 2012), environmental benefit(Sutcliffe 2011), solving moral problems(Van den Hoven 2013), and more specifically climate change, energy security, food security, health, and an ageing population (European Commission 2011a).

RRI furthermore is prone to both the fourth, trying to solve problems with technology might distract attention from the true solutions, and the fifth criticism, attacking of symptoms instead of the root out causes. This is illustrated by what has been termed 'a good example of responsible innovation in

action'(Jacob et al. 2013). In the UK a RRI pilot was undertaken in research into geoengineering, i.e. the deliberate manipulation of the earth's climate(Owen and Goldberg 2010). Among other things the pilot included public participation and construction of a code of conduct. Certainly, in terms of what RRI aims for procedurally, for instance public participation, this project must be considered a success. But from a broader perspective and in line with the technological fix criticisms, it could also be argued that instead of trying to change human behaviour to address global warming, geoengineering tries to do this goal by a technological fix. Geoengineering must then be considered a distraction from attending real solutions, such as reducing fossil fuel consumption. Also it represents an instance of attacking the symptoms -the rise in global temperature- instead of the root cause: collective human behaviour. Interestingly, the stakeholder involvement (including many scientists) done in the RRI pilot learned that there is a concern that research in geoengineering might distract from policy efforts towards mitigation of carbon emissions(Jacob et al. 2013; Parkhill et al. 2013). Again, this shows that the criticisms of technology fix are warranted but also that stakeholder participation as proposed by RRI might provide an adequate way to address them.

The sixth criticism points out that, inherent to technological innovation, also technological fixes involve unforeseen and possibly negative consequences that even may be worse than the (social) problem they intended to solve. While this criticism is a truism for any technological advancement RRI makes addressing this criticism as one of its primary interests. Indeed one of the core motivations for pursuing RRI is addressing the inherent uncertainty of future consequences of R&I(Owen et al. 2013; Grunwald 2011). Future consequences of R&I often are unknown or insufficiently known (Owen et al. 2013; Grunwald 2011). A reason for this is that consequences of R&I in many cases are not foreseeable (Von Schomberg 2013) due to imperfect foresight and inherent unpredictability (Owen et al. 2013; Owen, Macnaghten, and Stilgoe 2012). Predictability also becomes more difficult because negative or positive consequences oftentimes are not intentional (Von Schomberg 2013; Owen et al. 2013). Moreover, even if consequences could be known in principle they often remain unanticipated (Muniesa and Lenglet 2013) sometimes out of sheer ignorance (Lee and Petts 2013; Owen, Macnaghten, and Stilgoe 2012; Owen et al. 2013). This uncertainty not only makes it difficult to anticipate R&I impact on society, it also increases the urgency to address or anticipate potential consequences of R&I precisely because they are uncertain. Or as Owen et al (2013) phrase it: 'Allowing the future to take care of itself in the face of uncertainty is neither a satisfactory, or acceptable approach.'

Finally, the seventh criticism states that technological fixes help abrogate responsibility of people involved in the social problem and of the designers of technology involved in the fix. This criticism is seconded in RRI discourse by its suggestion of a need to address a 'responsibility gap' between the capability of R&I to produce disruptive consequences and the ability to take responsibility for these consequences (Groves 2006; Lee and Petts 2013; Owen et al. 2013). To address this gap re-conceptualization of responsibility is put high on the RRI agenda (Von Schomberg 2013; Grinbaum and Groves 2013; Owen et al. 2013; Stahl, Eden, and Jirotka 2013). Despite some conceptual endeavours it nevertheless remains an open question how responsibilities should be allocated in R&I practise. Moreover, by aligning R&I to social goals, RRI runs a risk of burdening technologists and others involved in R&I with a responsibility they cannot and should not bear.

5. Conclusion

Technological optimism is a widespread phenomenon among western societies. Alvin Weinberg articulated this optimism by suggesting quick technological fixes to social problems as an alternative to persuading individuals to change their behaviour through social engineering. In the wake of Weinberg's plea several criticisms were formulated to technological fix. Technological optimism has a contemporary incarnation in the emerging concept of RRI. By drawing parallels it was pointed out that RRI shares defining characteristics of technological fix. Both concepts aim at intently steering R&I towards attaining social goals, share an justificatory outlook on public funding of R&I, plea for alternate ways of governing R&I and propose close collaboration between social scientists and technologists.

Furthermore, a discussion of current RRI discourse in the light of seven main criticisms of technological fix clearly showed that these still carry relevance as potential pitfalls to current R&I efforts when geared towards attaining social goals. The discussion also elucidated that avoidance of these pitfalls is an import part of the RRI agenda. RRI for instance is suggested to avoid reductionism and narrowness of technological fix by stakeholder participation throughout the R&I process. Indeed an awareness of risk associated to technological fix is articulated explicitly in RRI discourse. Von Schomberg (2012), for instance, deems it irresponsible to put all attention and, hopes and fears primarily on innovation. Elsewhere RRI is described as key in addressing ambivalences found in society between optimistic and pessimistic attitudes(Fisher and Rip 2013) and as an approach that is sceptical of technological fixes (Stilgoe 2013; Sutcliffe 2011). Still, at the very heart of RRI, a technological optimism resides that proposes to deploy R&I in addressing a wide range of social issues ranging from environment to economics. By keeping an eye on the lessons of technological fix RRI may safeguard itself from over-optimism and its associated risks.

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ON THE GLOCALIZED NETIZEN

Jin Tong

Abstract
Regarding the basic meaning of netizen, the present paper focuses on the citizenship of a netizen and explores a possible ideal concept of netizen, i.e. a "glocalized" netizen. There are at least three threads of research on the citizenship of a netizen. The first point of view regards a netizen as a citizen of a certain country, emphasizing the civil rights and the civil obligations prescribed by a certain constitution. The second point of view regards a netizen as a digital global citizen, emphasizing the border-crossing nature of a netizen's actions. The third point of view, which this paper supports, regards a netizen as a "glocalized" netizen. This paper also explores some considerations from Taoist ethics and Confucian ethics which are helpful for the current research.

Keywords
Glocalized netizen, Cyberspace, Taoist ethics, Confucian ethics

1. The Meaning of "netizen" in everyday life

The word "netizen" (i.e. citizen online, citizen in cyberspace, cybercitizen, digital citizen) has slipped into our everyday life. Netizen refers to an individual who uses the internet frequently, as distinguished from other entities such as a government, a company, or some other organizations. Regarding the basic meaning of netizen, this paper focuses on the citizenship of a netizen and explores a possible ideal concept of netizen, i.e. a "glocalized" netizen.

The meaning of "netizen" changes a lot with the emergence and development of cyberspace, for instance, in China:

Firstly, when the internet just appeared in china in 1994, a netizen was an individual who was good at using internet and spent lots of her time surfing online (Li, 2002, 69; Chang, 2005, 64). Both the internet and the netizens were such rarities while a netizen was often considered as an IT expert. The meaning of netizen, focusing on the ability of using computer and internet, is rarely mentioned nowadays because the Internet becomes very popular.

Secondly, with the development of Internet, the citizenship of a netizen is being paid more and more attention by the academic community in China (Peng, 2005, 276). After the case of "Sun Zhi-gang" in 2003, the strength of Chinese netizens led to the abolition of the unjust "management method for internment and repatriation" in the whole China. From 2010, more and more Chinese netizens are active online especially by micro-blog, focusing on lots of corruption scandals and the protection of civil rights which are provided by Chinese constitution. In the social contexts, a lot of Chinese scholars emphasize the netizens' ability of being positive citizens of a certain country.

Since the Internet is a global information environment, a netizen will face the global digital world inevitably when she is surfing online. Similarly, the meaning of "netizen" should be more than a citizen of certain country.

2. Three Threads Of Research On The Citizenship Of A Netizen

There are at least three threads of research on the citizenship of a netizen.

2.1 A Netizen As A Citizen Of A Certain Country

The first point of view regards a netizen as a citizen of a certain country, emphasizing the civil rights and the civil obligations prescribed by a certain constitution. In fact, the information rights on which a

netizen's action is based are the extension of civil rights in the real (that is, the "offline") world. The information obligations of a netizen also take root in civil obligations in the offline world.

In T. H. Marshall's view, citizenship contains three elements: civil element, political element and social element (Marshall, 1992, 8-17). Some scholars add cultural element (Bloomfield and Bianchini, 2001, 144-146), environmental factor and civic virtues (Heater, 1999, 27-28) to citizenship. The elements regarding civil rights which are mentioned as above show the diversity of a citizen's rights in a modern country. As long as cyberspace integrates into our social life with its logical malleability, the elements of citizenship take concrete shape online through the actions of netizens. For instance, the right to internet access, the right to publishing online, the right to privacy online, the right to safety online, and the right to ownership of virtual property etc., as the expansions of individual freedom in offline world, become parts of the civil element of citizenship.

Accordingly, the obligations of a citizen also take concrete shape online. As the offline society, usual actions online are based on the basic order of the global cyberspace. Thus the obligations of a citizen include the obligation to obey the law of a certain country and the obligation to practice the basic social morality which is indispensable to the basic order of the whole cyberspace. Since there are some global elements in the words "netizen" and "cyberspace", it means that the first point of view has its limitation.

2.2 A Netizen As A Digital Global Citizen

The second point of view regards a netizen as a digital global citizen, emphasizing the border-crossing nature of a netizen's actions. Drawing on Greek philosopher Diogenes, we are "digital cosmopolitans" in the information society in the 21st century (Capurro, 2000). But what does the word "digital cosmopolitan" (in other words, "digital global citizen") mean exactly?

Since the whole cyberspace is still working normally without a universal constitution for the whole offline world, there exists at least a global order, in a weak sense, of the whole cyberspace. On the one hand, the global online order in a weak sense, comes from legal cooperation among countries and regions; on the other hand, it comes from the respect for basic human rights among billions of netizens in the world. To form a more reliable global order of cyberspace, netizens should become global citizens in a weak sense, since they do not have a universal constitution in force but do share some core values on which human rights are based. It means that, to maintain and improve the global order online to protect the core values, a netizen, no matter where she may be, should have some basic information rights and corresponding information obligations.

Summing up the two viewpoints, this paper puts forward the third viewpoint and explores the meaning of an ideal netizen preliminarily.

2.3 An Ideal Netizen As A "Glocalized" Netizen

The third point of view, which this paper supports, regards an ideal netizen as a "glocalized" netizen. The concept of glocalized netizen, at least in a weak sense, combines the border-crossing nature of cyberspace with the locality of all the specific countries and regions of the world.

Firstly, to maintain even to improve the basic global order online, a netizen should take the basic information obligations, e.g. doing not hurt someone online, and have the basic information rights, e.g. being able to access the Internet. The basic information obligations and the basic information rights constitute the minimum internet ethic. Based on the minimum internet ethic, being an ideal netizen is an attainable goal.

As an excellent citizen is not one who just obeys the law, an ideal netizen is not one who just surfs online with restraint of the minimum internet ethic. More than just maintaining the basic global order online, an ideal netizen does her best to improve the cyberspace through combining the cyberspace with the offline world positively to protect the core values. In the sense of Confucian ethics, a netizen cultivates her virtues in such kinds of positive actions. It is interesting that the Aristotelians share the same viewpoint with the Confucians.

Secondly, to solve a global issue with particular elements in a local place, an ideal netizen should make concrete analyses of concrete conditions. At the same time, the background of globalization also should be taken into consideration for solving the local issue. Having citizenship of a certain country and being conscious of global citizenship in a weak sense, an ideal netizen becomes a glocalized netizen naturally whose actions online are based on local conditions with global awareness.

So an ideal netizen as a glocalized netizen is a positive subject of public interaction online who improves the global order online, creates open information resources online for all, and participates in a public debate to form the public opinion for the protection of human rights. Such glocalized netizens are active subjects, both online and offline, and their actions form the global public sphere online which links cyberspace and the offline world. In the information age, the global public sphere online, which consists of public interactions online by billions of netizens, is perhaps the most important communication environment for solving global issues.

Strictly speaking, any research on the concept of a "netizen" is always influenced by a given cultural background. Consequently, this paper also explores some considerations from Taoist ethics and Confucian ethics which are helpful for the current research.

Some Considerations from Taoist Ethics

In Taoism, just as all roads lead to Rome, human beings can discover their nature to some extent through different ways. The point of view is based on a presupposition, i.e. the natural balance of Tao had been destroyed as the developing of civilization and we are capable to know just a part of Tao nowadays.

Zhuangzi, one of the most famous Taoists, lived in the Warring States period of China while hundreds of schools of learning and thought contended freely. He said that the natural balance of Tao had been destroyed:

All these schools have gone too far from ancient Taoism to backtrack themselves. It is a great misfortune that later scholars could not see the complete picture of ancient Taoism and the pure harmony between the heaven and the earth, Taoism will inevitably be disintegrated and disrupted.(Zhuangzi, Chapter2) [English translation of Zhuangzi is by Rong Pei Wang.]

Drawing on Zhuangzi, what we can hold respectively is just a part of the Tao since everything in the world has its "this side" and "that side".

What is ignored from "that side" may be perceived from "this side". Therefore, it is said that "that side" comes from "this side" while "this side" is derived from "that side"--which means that "that side" and "this side" give rise to each other……To recognize that there is no opposite for either "that side" or "this side" is the essence of Tao. To recognize the essence of Tao is like staying at the centre of things--ready to cope with the infinite transformation of things. (Zhuangzi, Chapter33) [English translation of Zhuangzi is by Rong Pei Wang.]

In the theory of Zhuangzi, laying aside the presupposition of a complete ancient Tao (i.e. Taoism), we also can find out two interesting viewpoints of Tao:

From the open point of view of Tao, it is exactly the contending of all the schools and thoughts that forms the complete expression of Tao nowadays. A school just expresses a part of Tao while we should admit that human beings are so limited in nature.

From the narrow point of view of Tao, the thought of a school which believes it holds the whole Tao is too arbitrary. A school is able to deepen the research of a part of Tao but it still has its limitation. While Zhuangzi criticized the Confucian was narrow-minded, he applied the open point of view of Tao unconsciously. But Zhuangzi forgot that he should self-examine his own theory from the narrow point of view of Tao at the same time. The Taoists, who are the same as the Confucian, only express a part of Tao while other schools can provide theoretically support for Taoism.

The fusion of the two viewpoints of Tao is helpful to enrich one’s thoughts in an information environment. When we combine the two viewpoints of Tao, we can find that an information environment, which can provide diverse information and allow all kinds of opinions to contend freely, is very important to a school or one person to develop her opinions.

Nowadays cyberspace provides a wealth of information which is a very useful basis for human actions. Different people who have different viewpoints and practices need different information. From the narrow point of view of Tao, one person just being a "local" netizen is too limited in mind. From the open point of view of Tao, through cyberspace a glocalized netizen can merge one's global vision and some local elements into the vital world and thereby approach the Tao as close as possible. In Taoism, one person who approaches the Tao also fulfills her nature at the same time. The kind of viewpoint-merger can remind people to open their mind for imagination and find the exact information which they need to fulfill their human nature today.

Some Considerations from Confucian Ethics

Confucianism includes the world-governed way in Tian Xia Thoughts, which is a kind of influential cultural spirit about how to govern public affairs in ancient China. In Confucianism, the world-governed way and world peace are closely related to lifelong study and moral cultivation of all the people. In the view of Confucianism, a netizen with virtues such as benevolence and rightness, which are treasured by Confucian ethics, will be a positive glocalized netizen naturally.

The Great Learning, one of the classics of Confucianism, provides eight steps of moral cultivation to approach the goal of Tian Xia Thoughts.

Such extension of knowledge lay in the investigation of things. Things being investigated, knowledge became complete. Their knowledge being complete, their thoughts were sincere. Their thoughts being sincere, their hearts were then rectified. Their hearts being rectified, their persons were cultivated. Their persons being cultivated, their families were regulated. Their families being regulated; their States were rightly governed. Their States being rightly governed, the whole empire was made tranquil and happy. From the emperor down to the mass of the people, all must consider the cultivation of the person the root of everything besides. It cannot be, when the root is neglected, that what should spring from it will be well ordered. (The Great Learning, The Text of Confucius) [English translation of The Great Learning is by James Legge.]

In the eight steps of moral cultivation, Confucianism supposes that moral cultivation of an individual is the basis of the order of a country and the peace of the world. Confucianism has profound influence on the Chinese culture more than two thousand years. So it is a deeply rooted idea in Chinese culture that the nature, human beings, a country and the world are closely related to each other and they should be in a friendly relationship. A person, in the view of Confucianism, not only should do her best to fulfill moral cultivation but also should do something good to the whole world when it is possible.

With the influential Confucian elements in Chinese cultural spirits, hundreds of millions of Chinese netizens embrace cyberspace with open arms. According to the report of China Internet Network Information Center, there are more than 5 hundred million netizens in China by the end of December 2012 (CNNIC, 2013). And then an interesting phenomenon happens: more and more Chinese netizens today actively take public interactions online with global awareness.

Topics of the public interactions online almost cover all aspects of society. From politics to entertainment, the public interactions online in China nowadays contain open discussions online and united actions online. For example, a lot of incisive comments on social events and lots of social cooperation appear on the micro-blogs in China. Although the Great Firewall still exists, all kinds of information from all over the world are posted online by millions of Chinese netizens. The public interactions online by netizens in China, especially the youth, are with global awareness consciously more or less. The supervision of Chinese cyberspace has its limitation but the strength of the civil society, from information sharing to social cooperation, is growing through cyberspace gradually.

All the elements, e.g. the need of modern social life, the border-crossing nature of cyberspace, the open essence of Chinese culture, push Chinese netizens, especially the youth who are "digital natives", to open their eyes to see the world and deal with local issues with global awareness to some extent. In other words, to be a good netizen in China is to be a glocalized netizen at least with the virtues which are treasured by Chinese culture. Both the open point of view of Tao and the Confucian main virtues may lay a preliminary foundation for the ethic of glocalized netizen.

3. Conclusion

Theoretically, on the one hand, a netizen is not merely a citizen of a certain country because of the border-crossing nature of a netizen's actions. On the other hand, a netizen is not a digital global citizen in the strong sense since she always lives in a certain country or a certain region. It may be better to combine the two citizenships into a "glocalized" netizen.

To a developing country such as China, an information environment online full of vitality is an essential requirement to the development of Chinese civil society. It is one of the obligations of Chinese glocalized netizens to improve the cyberspace through public interactions online, combining the essence of tradition with new knowledge. Cyberspace provides new opportunities and challenges for China. If more and more Chinese netizens are willing to emancipate the mind and create something new, a "renaissance" in China will happen online in the future.

To the netizens all over the world, a global open cyberspace with good order will provide lots of opportunities to search for the partner through global cooperation. It also means that we, being netizens, not only should have the civil rights and the civil obligations of a certain country, but also should do something to protect the rights of a digital global citizen. Fulfilling ourselves as glocalized netizens, we will learn about each other from the diversity of the world and work together for a similar goal, namely human flourishing, in different regions of the world through cyberspace. In the global village, it seems that being a glocalized netizen is an irresistible general trend nowadays.

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DIGITAL COMPETENCES AND ENTREPRENEURIAL SELF-EFFICACY AMONG GRADUATE STUDENTS

Teresa Torres-Coronas, María-Arántzazu Vidal-Blasco, Mario Arias-Oliva, and Ricard Monclús-Guitart,

Abstract

All social agents agree that one reform that should be urgently undertaken to support employment creation and speed up the recovery should aim at increasing the efficiency of the educational system to foster entrepreneurship. During the last few years, e-entrepreneurship has begun to emerge as a new business model from the synergies between ICT developments and a digital generation that can collaborate on economic development and recovery.

This paper focuses upon the digital and entrepreneurial competences of higher education students at Rovira i Virgili University (URV). It is an exploratory study to clarify if we can really take advantage of ICT to impulse business start-ups and economic recovery. The relationship among digital competences, lifelong learning, employability and e-entrepreneurship will be discussed.

Keywords

E-entrepreneurship, employability, start-ups, digital competences, life-long learning, youth unemployment

1. Introduction

One of the features of the global crisis that has received much attention, at least in Europe, is the different impact on unemployment among countries. Understanding the reasons why the crisis has had such differential labor market effects is crucial for designing employment policies that support employment creation and speed up the recovery.

With the aim of reducing structural unemployment, which is extremely high in Spain, Directive 7 of the "Europe 2020" strategy includes active labor market policies (ALMP), which attempt to reduce youth unemployment, among others.

Today, the route to growth and economic recovery depends on creating more businesses and having a workforce with the skills to support business start-ups. Thus, recovering from the severity of the financial crisis requires enhancing human capital and employability by upgrading skills and ensuring a better match between the supply of skills and labor market demands. Are we ready to take advantages of these new e-entrepreneurial opportunities for economic recovery? To answer this question we need to know if we really have a skilled workforce.

This paper focuses upon the digital competences and the entrepreneurial self-efficacy of undergraduate students at URV (http://www.urv.cat), a public university located in the autonomous region of Catalonia, in Spain.

2. E-entrepreneurship and competence requirements

2.1 Entrepreneurship and e-entrepreneurship

Entrepreneurship can be defined as a certain mindset and process associated with individuals, who possess a set of competencies (e.g. creativity, risk-taking…), showing these competencies in distinctive entrepreneurial behavior (turning a business idea into success), alongside daily management (Commission of the European Communities, 2003a)

In Europe, one of the main challenges facing EU member states is the need to boost entrepreneurship. That was one of the objectives set by the Lisbon European Council, in March 2000, with a view to improving the Union's performance in terms of employment, economic reform and social cohesion. But, do we have enough entrepreneurs? In Spain, reality shows that entrepreneurship is not a popular option among the young. Policies to promote entrepreneurship, in general, must still be reinforced.

The information society is characterized by the intensive use of information technologies and the resulting change from an industrial to a knowledge society (Kollman, 2006) ICT and the emergence of technological dynamism are positively impacting entrepreneurship (Lans, Wesselink, Biemans, and Mulder, 2004). As a result, new forms of entrepreneurship have begun to emerge from the synergies between ICT developments and changing paradigms of a knowledge society. At the same time, due to the importance of information as a supporting and independent competitive factor, as well as the increase in digital data networks, it must be assumed that there will be two relevant trade levels on which the world will do business in the future. In addition to the level of real, physical products and services (real economy), an electronic trade level for digital products and services (net economy) is evolving.

In recent years, concepts such as e-business, net economy, e-commerce, information economics, network economics are used as synonymous and they are understood as an strategic way to improve communication within organizations, to enhance collaboration with key external stakeholders, such as customers, suppliers and government representatives (Basu and Kumar, 2002; Byrd, 2001). ICT facilitates the evolution of new and innovative organizational forms (Matlay and Westhead, 2005; Matlay and Martin, 2009) that help organization to achieve sustainable competitive advantage in an increasingly globalized economy (Martin and Matlay, 2001; Martin and Matlay 2003; Li, Mitra, and Matlay, 2004; Matlay and Martin, 2009).

Following (Kollman, 2006, p.333) e-entrepreneurship refers to "establishing a new company with an innovative business idea within the net economy, which, using an electronic platform in data networks, offers its products and/or services based upon a purely electronic creation of value. Essential is the fact that this value offer was only made possible through the development of information technology."

In the context of a global economic crisis, Internet is a platform for setting up business providing entrepreneurial opportunities to those who may not be capital rich (Waddell, Singh, and Musa, 2006). Advances in ICTs and the advent of the Internet have facilitated the emergence and growth of collaborative strategies amongst small e-businesses (Matlay and Westhead, 2005); Matlay and Martin, 2009) which could be defined as low-cost strategy.

2.2 E-Entrepreneurship and competence development

Work competences which guarantee transferability are considered to be very important, while self-directedness and the ability to manage on one's own during working life are highly appreciated (Glastra, Hake, and Schedler, 2004). Education and training systems must generate those new skills, including the basic skills and learning that are pre-requisites for further updating of skills, in order to respond to the nature of the new jobs which are expected to be created, as well as to improve the adaptability and employability of adults already in the labor force.

In parallel, the e-Learning initiative part of the e-Europe Action Plan, seeks to promote a digital culture and wider use of ICT in education and training. In the connected learning society the use of ICT will facilitate easy access to lifelong learning for all. In that sense, ICT has been described as a significant educational tool in the professional life for lifelong learning (Maddux, 1994) as it reduces, among others, barriers to participate in formal education (European Commission).

(e)-Entrepreneurs require a wider portfolio of skills and a more significant knowledge base, which is necessary to support the start-up stage as well as the management and development of their new ventures (Wagner, 2003; Matlay, 2004). So, creating a successful knowledge-based economy supported by (e)-entrepreneurship requires the development and implementation of strategies and opportunities for lifelong learning (Commission of the European Communities, 2003b).

In the context of the European Union, entrepreneurship education aims to prepare people to be more responsible, to become entrepreneurs, or entrepreneurial thinkers, and contribute to successfully addressing the entrepreneurial challenge within the EU (Edwards, and Muir, 2005; Fayolle, 2005; Commission of the European Communities, 2006). EU state members are making efforts to facilitate the development of university graduates and increase the numbers of highly qualified entrepreneurs.

Higher education institutions should try to cover the ICT skills and competencies and, at the same time, they should develop entrepreneurial competencies among their students. Any higher education institution needs to continuously monitor economic and job prospects and to adjust the university's curricula accordingly.

The European Higher Education Area (EHEA) is an education model with a competence-based approach, which aims to ensure that the competences taught are those that are required in the workplace. Thus, the goal of any competence-based education is to ensure that learning is transferred to the workplace. It involves an extensive process of identifying relevant competences, after which learning activities need to be developed. It is important for graduates to have advanced user knowledge of ICT, to know how to adapt their communication style to the new technological environment and, at the same time, be able to work collaboratively in virtual teams. The EHEA prioritizes collaborative work as a transferable competence in order to promote independent, committed learning that is in tune with the changing needs of e-entrepreneurship today.

3. Research Methodology

In an era of economic meltdown, the objective of this research study is to determine whether higher education institutions foster self-employment opportunities by helping students to develop the digital competences and (e)-entrepreneurial self-efficacy they need. In this context, this exploratory study wants to know if there is a relationship between self-reported digital competence level and (e)-entrepreneur self-efficacy.

The URV competence framework divides student's competences into three different types: specific, transverse and nuclear. Specific competences relate to the knowledge (knowing and understanding) and skills (knowing how to act) of each degree. They are not transferable to other professional fields. Transferable competences relate to attitudes and values (knowing how to be) and, procedures (know how). They can be transferred from one specific professional field to another. Finally, core competences are competences required by all URV students, which may be knowledge, attitudes and procedures, such as digital competences.

3.1 Sample and data

The survey was carried out at the end of the second semester, school year 2010–2011. By the time this survey was concluded, 621 questionnaires were collected. The exclusion of 43 invalid questionnaires resulted in a total of 578 complete and valid ones for data analysis. Most of the respondents were full-time undergraduate students (75.6%) and 24.4% of respondents were part-time ones. Looking at the gender characteristics of the sample, 52.6% were female and 47.4% were male. A 50.2% of them were majoring in Social Sciences and a 49.8% in Engineering.

The questionnaire was divided into three parts: (a) background (3 items: students sex, field of studies and enrolment status), (b) student's e-competence level, based upon the previous research of (Torres-Coronas, T. and Vidal-Blasco, 2011) (8 items), and (c) student's e-entrepreneurial self-efficacy based on a self-assessment questionnaire (6 items). A 5-point Likert scale was used in both cases. Data on student's e-entrepreneurial self-efficacy was converted into a mean score to reflect the individual's average level of self-efficacy. This approach stresses that an individual having (e)-entrepreneurial self-efficacy will always find the path to become an (e)-entrepreneur.

E-entrepreneurial self-efficacy scale is consistent with Bandura's Social Cognitive Theory (Bandura, 1986, 1997) and self-efficacy as a psychological variable that explain the establishment and development of career goals. Self-efficacy refers to "people's judgments of their capabilities to

organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p.391) and to predict occupational interests (Bandura, 1997), including the entrepreneurial option. Entrepreneurial self-efficacy can be enacted by educational situations which can derive in favorable attitudes towards self-employment (Vázquez, Gutiérrez, Lanero, and García, 2009). The scale developed by (Liñán, and Che, 2006) was adopted to evaluate entrepreneurial self-efficacy.

3.2 Statistical analysis and results

In processing the survey data, the collected questionnaires were coded, and GNU PSPP version 0.6.2 software was used for statistical analysis. We used inferential statistical analysis (t-test) to identify significant differences between groups (male versus female participants and, social science students versus engineering ones). A significant level of .05 was used by the researchers. Mean and standard deviation were used to analyze the digital competence level and the entrepreneurial self-efficacy of respondents.

Table 1. digital competence level among URV students

	Total sample (N=578)		Female (n =304)		Male (n = 274)		Social Science (n=290)		Engineering (n=288)	
	Media	Std. Desv	Media	Std. Desv	Media	Std. Desv	Media	Std. Desv	Media	Std. Desv
1- Ability to use interactive e-tools and not only asynchronous email to communicate (e.g., Skype)	4.01	0.99	4.11[a]	0.95	3.89[a]	1.03	4.04	0.99	3.97	0.99
2- Ability to use specific e-tools and software to support virtual team collaboration (e.g. Google docs)	3.09	0.99	3.12	0.95	3.05	1.05	3.02	0.95	3.15	1.04
3- Ability to foster e-collaboration and exchange of ideas with others (e.g.. e-leadership)	2.2	1.23	2.26	1.22	2.14	1.23	2.19	1.18	2.22	1.27
4- Ability to tailor e-communication style to suit the audience and situation (e.g.. blog design and development)	3.5	1.27	3.61[a]	1.24	3.37[a]	1.29	3.52	1.25	3.48	1.3
5- Ability to organize a virtual team and allocates tasks and responsibilities to achieve objectives	3.47	0.95	3.37[a]	0.9	3.58[a]	0.99	3.4	0.93	3.53	0.96
6- Ability to seeks and evaluate e-sources of information to solve problems and support decision making	3.97	0.84	4.03	0.82	3.9	0.86	3.93	0.79	4	0.89
7- Ability to manage Internet security and legal issues	3.46	1.02	3.58[a]	0.91	3.35[a]	1.12	3.52	0.95	3.42	1.08
8- Ability to build and manage virtual social networks	3.91	1.12	3.95	1.07	3.87	1.18	3.93	1.09	3.9	1.15

a. Statistically different means, $p < 0.05$

3.3 Digital competence level

Table 1 presents the means and standard deviations of the digital competence score of respondents. In descriptive terms, participants score low in *e-leadership* (M=2.2) and show moderate competence

level in the *use e-tools to support virtual team collaboration* (M=3.09), in the *Ability to tailor their e-communicative style* (M=3.5), in the *Ability to organize a virtual team* (M=3.47) and in the *Ability to manage Internet security and legal issues* (M=3.46). Higher levels of competence are found in the *Ability to use interactive e-tools to communicate* (M=4.01), the *Ability to seeks and evaluate e-information* (M=3.91) and, in the *Ability to build and manage virtual social networks* (M=3.97). In general, undergraduates' digital competence level seems to be good enough to allow them to be a productive and active part of the e-business world. But, is this enough to become an e-entrepreneur?

An independent samples t-test found no differences between participants by field of study. This is a consistent result with the definition of digital competences as core competences required by all URV students. Within this level of analysis, it can be stated that the Bologna process is working as expected: building up homogenous and digitally competent graduates, with relatively high levels of core competences.

By gender, this study demonstrates that women are not more likely to lack the digital competences which enable them to take advantages of the new labor market opportunities. Women are statistically ahead of men in their ability to use e-tools for communicating on line, their ability to fit the e-communication style to suit different audiences and in their ability to manage Internet legal and security issues. So, is digital divide being reduced among tertiary education students?

Table 2: entrepreneurial self-efficacy score

	Total sample (N=578)		Female (n =304)		Male (n = 274)		Social Science (n=290)		Engineering (n=288)	
	Media	Std. Desv	Media	Std. Desv	Media	Std. Desv	Media	Std. Desv	Media	Std. Desv
1- Start a e-firm and keep it working would be easy for me	2.20	1.57	1.95[a]	1.41	2.48[a]	1.69	2.10	1.51	2.30	1.63
2- I'm prepared to start a viable e-firm	2.35	1.37	2.01[a]	1.24	2.73[a]	1.41	2.05[a]	1.22	2.65[a]	1.44
3- I can control the creation process of a new e-firm	2.05	1.24	2.08	1.27	2.03	1.21	1.98	1.20	2.13	1.28
4- I know the necessary practical details to start a e-firm	1.82	1.06	1.83	1.09	1.81	1.04	1.83	1.07	1.82	1.06
5- I know how to develop an e-entrepreneurial project	2.20	1.22	2.26	1.22	2.14	1.23	2.19	1.18	2.22	1.27
6- If I tried to start a e-firm. I would have a high probability of succeeding	2.10	1.15	2.00[a]	1.06	2.20[a]	1.24	2.05	1.05	2.15	1.24
e-Entrepreneurial_self-efficacy[b]	2.12	0.69	2.02[a]	0.65	2.23[a]	0.72	2.03[a]	0.67	2.21[a]	0.70

a. Statistically different means, $p < 0.05$

b Cronbach's alpha reliability coefficient = 0.50 or acceptable as defined by the rule of thumb of (George, and Mallery, 2003). Cronbach's alpha women = 0.50; Cronbach's alpha men = 0.53; Cronbach's alpha social science = 0.55; Cronbach's alpha engineering = 0.48.

3.4 e-Entrepreneurial self-efficacy

Table 2 presents the means and standard deviations of the e-entrepreneurial self-efficacy scale and their six components. Participants score low in all variable, with engineering and male students showing a slightly higher score on e-entrepreneurial self-efficacy. This research result offers evidences about the need to boost student motivation and develop appropriate reinforcements and effective modes of e-entrepreneurship training by field of study and/or gender. In general, the whole population needs to improve its self-efficacy for e-entrepreneurship. Though, the results obtained do not made it clear what kind of curricular teaching and extracurricular support are needed to foster an e-entrepreneurial career among undergraduate students. One thing seems clear, and it should need further research, to be highly digital competent does not create an e-entrepreneur. It is entrepreneurship more about attitudes and self-confidence than competences?

3.5 Digital competence level and e-entrepreneurial self-efficacy correlations

We have looked at Pearson's r as a descriptor of the degree of linear association between variables. The significance level calculated for each correlation is a primary source of information about the reliability of the correlation (see Table 3). After that, and in order to interpret correlation results in social sciences, we applied Cohen criteria (Cohen, 1988, pp. 77-81) who set (and justified) as guiding principle these ratings: r= 0.10 low correlation, r=0. 30 medium, and r= 0.50 high.

Correlations displayed in Table 3 point to many positive significant relations among variables. There exists a high correlation between e-entrepreneurial self-efficacy and the ability to foster e-collaboration and exchange of ideas with others. In the remaining cases, correlation is low or non-existent. These results show that a good level of digital competence is not enough to have the degree of confidence needed to start an e-business.

Entrepreneurship is an acknowledged objective in Spanish education, explicitly embedded in all national curriculum frameworks by the Education Act of 2006. Curricula, from primary to tertiary educational level, are neither stimulating entrepreneurial mindsets nor equipping students with the attitude and self-confidence needed to set up a business and manage its growth. Our results show that, especially in the field of e-business, we are still far away from the objective.

Table 3. pearson's correlation (two tales) among variables

	Interactive tools for	Software to support virtual	Foster ecollaborati	Tailor ecom style	Organize virtual	Evaluate info	Security legal issues	Social networks	eEntreprene ur self-efficacy
Interactive tools for com	1.00								
Software to support virtual team	0.17[b]	1.00							
Foster e-collaboration	0.03	0.16[b]	1.00						
Tailor e comm style	0.32[b]	0.21[b]	0.18[b]	1.00					
Organize virtual team	0.13[b]	0.20[b]	0.14[b]	0.15[b]	1.00				
Evaluate info	0.26[b]	0.31[b]	0.08	0.14[b]	0.35[b]	1.00			
Security legal issues	0.12[a]	0.14[b]	0.23[b]	0.09	0.37[b]	0.19[b]	1.00		
Social networks	0.20[b]	0.15[b]	-0.02	0.45[b]	0.21[b]	0.23[b]	0.07	1.00	
e-Entrepreneur self-efficacy	0.08	0.19[b]	0.53[b]	0.28[b]	0.23[b]	0.08	0.17[b]	0.16[b]	1.00

b p < 0,05; b. p < 0,01

4. Conclusion

ICT are opening new opportunities for economic recovery through new business start-up. Technologies, public policies (and especially active labor market policies), and educational practices related to e-entrepreneurship can create a fruitful context for developing the Net Society. But before, as our results have shown, we need to solve a perceived entrepreneurship self-efficacy problem.

Europe is experiencing major transformation in which knowledge and innovation are the most valued assets. In this new society, there is an empathic need for offering everyone the opportunities to acquire the relevant skills, knowledge and competences as the route to full involvement in professional and social life. So much the more this need is stressed in adult and continuing education from the perspective of the stringent upskilling demand of Europe's labor force for economic recovery.

Our results show that tertiary educational system in Spain is good at putting into practice the Bologna process but it might not be so good at building up entrepreneurial self-confidence among their graduate students. For that reason, higher education institutions still need to design and develop further the opportunities they make available to their students so as to enable them to consider (e)-entrepreneurship and self-employment as an option upon graduation. In doing so, higher education will be really contributing to students employability.

We have left behind full employment, a job for life seems to be a thing of the past and unemployment rates are going up and up. A cultural change is need where knowledge (and lifelong learning), access to technology, creativity and (e)-entrepreneurship must be managed as key factors for economic recovery. Our study reveals that we are working step by step (but slowly!) towards the Net Society and the economic model needed for economic recovery.

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CHALLENGES IN ENTERING APPLICATION MARKETS AMONG SOFTWARE PRODUCERS IN DEVELOPING COUNTRIES

Anne-Marie Tuikka, Sami Hyrynsalmi, Kai K. Kimppa and Arho Suominen

Abstract

Smart devices, such as smart phones and tablet computers, have rapidly conquered the world with millions of users. The success of a few developers and the low entry barrier to the application marketplaces of these smart devices have led to the offering of hundreds of thousands applications by thousands of software producers. Although the average revenue at the marketplaces is seen to be low for western developers, it might be highly lucrative for developing country software producers. However, only a few of these are known to offer their products for worldwide markets. Furthermore, we argue that easy access to creating and selling applications might help the developing countries bridge some of the gap between them and post-industrialized countries. In this initial study, we present a conceptual framework which can be used to analyse the obstacles of developing country software producers to enter to the marketplaces. Some initial implications can be made based on the framework.

Keywords

Application marketplace, Digital Divide, Developing Countries, Newly Industrialized Countries, Google Play

1. Introduction

In recent years, smart phones have gotten a significant market position worldwide and currently tablet computers are following suit. These smart devices are a fast growing new market segment, and new marketplaces, such as Apple App Store, Google Play, Nokia Store and Windows Phone Marketplace, have emerged to offer applications for these devices. All of these mobile ecosystems offer either free or low cost access to software development tools and free or low cost entry to the marketplaces. That is, the development can be started quite easily by anyone from anywhere. Hence, it can be argued that open marketplaces are accessible worldwide.

Most of the software developers who sell or offer their products in these new marketplaces come from developed countries. However, the average revenues gathered from direct sales are, at least in Google Play, small (Hyrynsalmi et al., 2012c) and a majority of the investigated applications were estimated to be small ones that could be created with a less than a few man months of work (Hyrynsalmi et al., 2012b). The median revenue earned from an application marketplace might be unprofitable for a western developer–it might be lucrative for developing country software developers.

Although, the economic entry barrier for a developer is low in, we are not seeing significant numbers of software developers from developing countries. However, the marketplaces are a potential growth medium for less-developed country developers to publish their products due to three reasons: 1) the economic investment required to start the business is low, 2) the average workload of building an application is small, and 3) the potential market, that can be easily reached, is huge.

The objective of the research is to define challenges which could explain this phenomenon by focusing on economic, financial and social context within developing countries. Therefore, our research question is: *What issues are hindering application developers emerging from developing countries?*

We base this research on the existing literature in order to identify relevant factors for the research question. We acknowledge that the found factors are not specific for the application economy;

however, we argue that the new market segment offers higher potential to success stories e.g. than car industry. Although the findings of this study are preliminary, they can be used in further studies to suggest actions for policy design.

2. Background

2.1 Digital Divide and Mobile Devices

Digital divide exists either on a national or international level. When digital divide is studied between developed and developing countries, it is often defined based on the infrastructure, amount of technical devises and availability of communication services within these countries. A certain country could have a relatively good ICT infrastructure; its citizens may have different kinds of possibilities to benefit from it. Also, access to communication services is influenced by the living environment and social status of a citizen.

We focus on the digital divide in global level between developed and developing countries. The World Bank defines the development of a country according to its gross national income (GNI). They use GNI per capita and Atlas conversion factor to calculate country specific GNI (World Bank, 2012). United Nations Development Programme has created Human Development Index (HDI) in order to measure human aspects of development in addition to economic development (Clark, 2011). HDI includes other indicators of development which are life expectancy at birth, mean years of schooling and expected years of schooling (UNDP, 2012). In this study, we classify countries with medium or low human development index as developing countries. Digital divide is often defined as the gap between ICT haves and have-nots (Sciadas, 2002), however, it is not sufficient to define digital divide merely as a question of access; instead, it is more complex social phenomenon (Stevenson, 2009). We use ICT Development Index 2011 (ITU, 2012) to classify the different countries to developing and developed.

The importance of mobile devices as devices to access internet has grown significantly. This shift has first appeared in developed countries, but it has also reached developing countries. For example, in Thailand 30 % of mobile phone subscribers had access to internet in 2010 (Srinuan et al., 2012).

Mobile phones have become popular in developing countries in relatively short time. Thus, there is a good reason to believe that other mobile devices might become popular in developing countries in the near future–see e.g. Datawind Ubislate Series[1] Android tablets which are available for around 50 €. This would offer possibilities to use new kinds of software applications for the citizens of developing countries, and create new application markets in developing countries. If the application markets for smart devices were to grow in the developing countries, it could also have important social effects by raising employment levels and creating new wealth in the countries capable of producing applications for these markets.

2.2 Bottom of the Pyramid and Entry Barrier

Looking at the potential of developers arising from developing countries, we identify three theoretical concepts relevant to the subject: *bottom of the pyramid*, *frugal engineering* and e*ntry barrier*. We view the above conceptualization as a frame to understand the potential and logic behind the expectation on successful developers emerging from developing countries.

Prahalad and Hart (2002), London and Hart (2004), and Prahalad (2010) raise the managerial challenge of selling products to the poorest two-thirds of the world. Prahalad and Hart (2002) define global consumer groups into four tiers. Tier one consists of upper- and middle income consumers in developed countries, tiers two and three of poor consumers in developed countries or middle class in emerging developing countries, and tier four of the four billion poorest. In the fourth tier, there is

[1] http://www.ubislate.com/index.php, Accessed on 15.3.2013

previously unused market potential that could be tapped into. Prahalad and Hart (2002) make the argument that even though companies need to re-evaluate their risk-rewards structures the potential of this tier is significant. Karamchandani et al. (2011) noted that innovations that "engage the poor" seldom come from the established mainstream players, but rather from individuals and companies capable of rethinking business models.

This is connected to the frugal engineering or frugal innovation approach, where products are developed to be "good-enough" – low cost production with a high value produced. (Zeschky et al., 2011) Drawing from the conceptualisations of Christensen's (2011) disruptive innovations – products that offer superior value at a low cost, we have seen emergence of several products adopted widely in both developing and developed markets. As an example, Tata Motors launched Tata Nano car priced at USD 2500 (Treece, 2008).

Zeschky et al. (2011) argue two implications, ultimately linking the bottom of the pyramid and frugal engineering. First, organizations should understand the "value architecture of frugal innovation" (Zeschky et al., 2011). Innovations directed to the bottom of the pyramid are "homegrown" creating a unique value to a specific market with the lowest possible cost. Second, the frugal innovations are to a significant extent driven by local organizations. Actors who have direct access to the market and ultimately the local talent that is able to translate needs and demand into valuable products.

Entry barrier is, as reviewed by McAfee et al. (2004), an economic barrier that limits entry to a market. The economic barrier is a cost that must be incurred to enter the market and can be divided into a primary barrier, a cost to entry on its own, and a secondary barrier that reinforces other barriers of entry if present. In the application economy, the primary entry barrier to the market is relatively low, clearly inside the margins of microloans, but there are several significant non-monetary secondary barriers, such as skills, which might deter from an actual venture being set-up. However, understanding the potential of the emerging market–made possible by the ever increasing volume of lower cost mobile devices–frugal innovations developed towards the emerging markets are probable.

2.3 Mobile Application Marketplaces

Although mobile operating systems have supported application development by third parties for several years, the rapid growth of the application industry started with the launch of the first iPhone by Apple. One of the major factors affecting the growth is the easy distribution and offering of the products for the customer via a centralized marketplace. Instead of planning distribution channels or supply chains, the application developer can publish the product on the marketplace and wish for success.

Several application marketplaces have emerged to offer products also for devices used by different mobile operating systems. Despite the diversity in the offering, three stores seem to control the major share of the industry. The dominant marketplaces by Apple, Google and Microsoft, offer (1Q/2012) over 800,000 applications from over 200,000 developers (Hyrynsalmi et al., 2012a) and the numbers have since continued to increase.

As an example, the application store of Android operating systems can be used as a representative example because:

1) The Android development environment is openly available for the common operating systems of personal computers, and the hardware requirements are rather low;
2) The entry fee to the marketplace is low (currently one-time fee of USD 25);
3) The marketplace does not pre-screen the applications, thus the newcomers can easily and swiftly publish their first products; and
4) The platform has a major share of smart device markets (Gartner Inc., 2011) and thousands of solvent customers.

These features, especially the low entry barrier and the large potential market, might be crucial reasons for a developing country software developer to select a specific platform. However, it should be noted that the orchestrators of the marketplaces deny right to entry from some countries. The

monetization, nonetheless, of the products in Google Play is argued to be hard (see e.g. Isaac, 2011) due to open culture, and the revenue earned from direct sales is evaluated to be a rather small for the developer (Hyrynsalmi et al., 2012c).

3. Study of Locations of top Developers

We used the overall top applications listings provided by Distimo for Apple App Store (AAP), Google Play (GP) and Windows Phone Marketplace (WPM) in order to identify the most successful mobile application vendors. For the first two, we gathered the top 100 mobile applications from the top free, the top paid and top grossing listings. The last one includes the most earning applications based on the revenues gathered from the direct application sales and the revenues gathered from in-application sales. For WPM, we used only the free and paid listings as the top grossing list is not available. The data was gathered in the middle of January 2013.

We identified 622 unique applications, by 427 vendors, out of the total of 800 applications studied. We went through several data sources in order to find out where each company is from. We used e.g. the company's webpage, location reported in company's Twitter account, the address given in the company's LinkedIn page, and the location mentioned in interviews. In cases where a company had offices in different countries, we used the location of the headquarters. We could not find any reliable information for 61 companies and these were omitted. As Table 7 shows, most of the studied application vendors come from countries with (very) high development index and only a few from less-developed.

Table 7: The top 427 mobile application vendors classified by country and marketplace and the country's classification or ranking in Human Development Index 2011, ICT Development Index (ITU, 2012) and Gross National Income based on Country Groups (2012) by World Bank.

Country	All	AAP	GP	WPM	HDI[1]	IDI	GNI[2]
USA	186	86	65	50	VH	15.	HI
UK	25	12	7	6	VH	9.	HI
China	18	3	5	10	M	78.	UMI
Canada	12	4	5	4	VH	22.	HI
Sweden	12	8	6	1	VH	2.	HI
Russia	10	0	3	7	H	38.	UMI
France	9	3	5	2	VH	18.	HI
Japan	7	3	5	1	VH	8.	HI
Switzerland	6	0	4	2	VH	10.	HI
Australia	7	4	2	3	VH	21.	HI
Germany	5	2	0	3	VH	16.	HI
Austria	5	2	1	2	VH	19.	HI
Finland	5	4	1	2	VH	5.	HI
Korea, Rep.	5	1	5	0	VH	1.	HI
New Zealand	4	2	1	2	VH	17.	HI
Spain	4	1	2	1	VH	28.	HI
Brazil	4	1	0	3	H	60.	UMI
Norway	4	1	2	2	VH	13.	HI
Poland	3	0	1	2	VH	31.	HI
Israel	3	1	2	0	VH	27.	HI

Italy	3	0	1	2	VH	29.	HI
India	3	0	0	3	M	119.	LMI
Netherlands	2	0	1	1	VH	6.	HI
Denmark	2	1	1	0	VH	3.	HI
Cyprus	2	2	0	0	VH	44.	HI
Thailand	2	0	2	0	M	92.	UMI
Singapore	2	1	0	1	VH	12.	HI
Ukraine	2	1	0	1	H	67.	LMI
Hong Kong	1	0	1	0	VH	11.	HI
Indonesia	1	1	0	0	M	95.	LMI
Belarus	1	1	0	0	H	46.	UMI
Taiwan	1	1	0	0	-	-	-
Bahrain	1	0	1	0	VH	40.	HI
Estonia	1	0	1	0	VH	24.	HI
Czech Republic	1	0	0	1	VH	32.	HI
Hungary	1	1	0	0	VH	41.	HI
Bulgaria	1	0	1	0	H	51.	UMI
Serbia	1	0	1	0	H	48.	UMI
Kuwait	1	1	0	0	H	-	HI
South Africa	1	0	0	1	M	91.	UMI
Luxembourg	1	1	0	0	VH	7.	HI
Unknown	61						

[1] VH (Very High), H (High), M (Medium), L (Low)

[2] HI (High-income economies), UMI (Upper-middle-income), LMI (Lower-middle-income), LI (Low-income)

4. Towards a Conceptual Framework

In this section, we will present a conceptual framework including several factors related to the use of smart devices and creation of applications for these platforms in developing countries. This framework is based on the research of Korpela et al. (2001) and Tiihonen (2011). Our initial concept included eight factors: *Technological*, *Skills*, *Microeconomic*, *Macroeconomic*, *Education*, *Social*, *Infrastructure* and *Policy*. The framework was further developed by dividing it into two levels: societal and individual. The societal level was identified from the studies about the context around information systems. For example, Korpela et al. (2001) presented a model for analysing different aspects of society. This model defines four levels to study information systems: individual, group, organizational and societal level. For this research, we limit our analysis to societal and individual level.

Tiihonen (2011, pp.88-92) presents that five environmental factors affect the use of information systems: *socio-political*, *organization*, *infrastructure*, *people* and *economy*. She argues that for a specific type of research some of these environmental factors can be relevant and others might not. We focus on three of these factors: infrastructure, economy and socio-political. Economy will be studied as macro-economy at the societal level and as financial situation at the individual level. The

socio-political factor is divided into politics and policy at societal level and to social class at individual level. Education is seen as an important part of the socio-political factor, thus, educational system is seen as a factor in the societal level and educational background is included in the individual level.

Tiihonen (2011, p.91) included people in her framework. People are also essential for studying the creation of applications; however, people are not included in our conceptual framework as a factor. Reason for this is that our concept is meant for studying the factors which affect people or are produced by people. Thus, people are the actors–not the factors of our concept.

Our concept includes upcoming factors at societal level: Infrastructure, Macro-economic, Politics and Policy, Educational system, and Culture. At the individual level, our concept includes Technological background, Skills, Financial situation, Social class, and Educational background. The framework is illustrated in Figure 1.

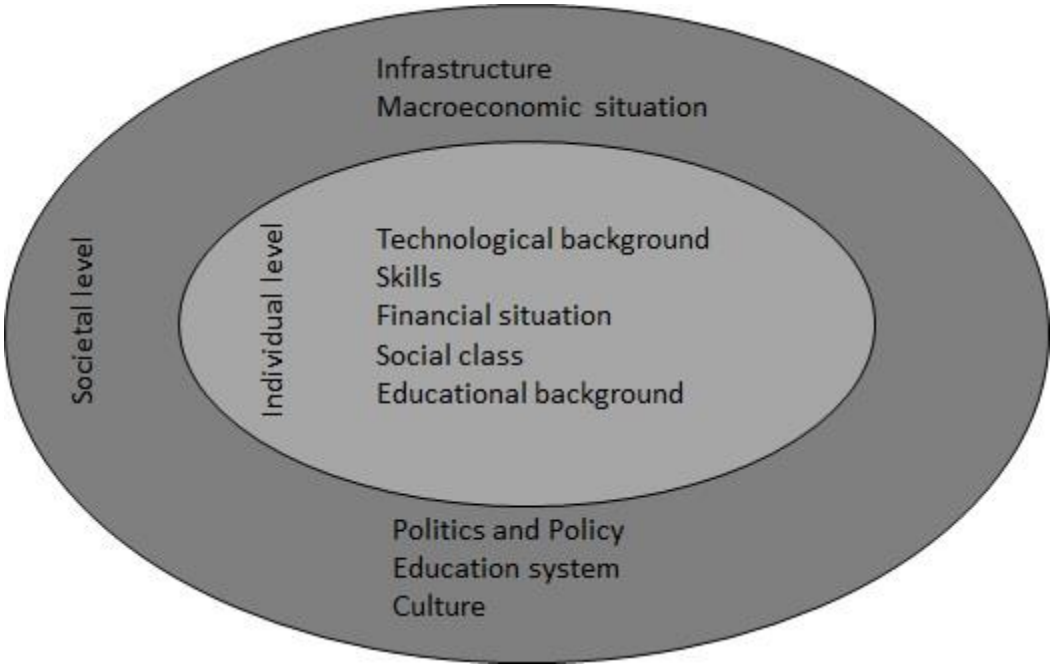

Figure 1: Conceptual framework

4.1 Factors in the social level

Infrastructure

Many developing states, which do not have widespread landlines, find the installation of infrastructure for mobile phones to be relatively inexpensive (Sridhar & Sridhar, 2007). In those areas of the world, where fixed-broadband connections are poor, mobile-broadband is growing its popularity as the main method to access internet. This is partially related to the fact that mobile-broadband connection can be the only choice to access internet in some developing countries or in certain rural areas. The growth of mobile-broadband has been high globally during the 21st century, and current mobile-broadband penetration is twice as high as fixed-broadband penetration at global level. However, mobile-broadband is not available in every country, and in many countries it is available only in urban areas. (ITU, 2012) Infrastructure requirements for mobile devices rather low; although, e.g. poor electricity supply naturally hinders development work.

Macroeconomic

The advances in country's ICT infrastructure, access and use are often linked to country's economic wellbeing and growth. GDP is often used to measure these issues. According to Comer & Wikle (2008), mobile phone penetration strongly correlates with country's GDP per person. Sridhar & Sridhar (2007) have analysed the relation between all telephone lines, including the mobile main lines, and found out that they correlate with GDP per person.

In correspondence to recent statistics, privatization of telecommunication sector relates to better services and lower prices (ITU, 2012). Previous research has found evidence that growth of internet use is positively correlated with the privatization and deregulation of telecommunication sector (Guillén & Suárez, 2005).

Politics and Policy

Foster and Heeks (2010) have studied how policies affect micro-enterprises in urban areas in developing countries. Their results imply that policies which promote decentralization in the city and retrieve foreign investments can hinder entrepreneurial activities among local inhabitants. Decentralization may not function as planned, thus, it can lead to the growth of corruption. Foreign investments to the urban area can result in the marginalisation of modes of earning or economic activities of the poor and their micro-enterprises. Because the success of micro-enterprises is related to their owner's wellbeing, policies which enhance health services, increase the quality and amount of housing, and reduce crime in the area can increase micro-enterprises' possibility to survive.

Education system

It has been found that the quality and extent of higher education enhances economic development through technological catch-up (Bloom et al., 2006). According to Pick and Azari (2008) the levels of science and technical journal publications as well as the quality of math and science education are associated with technology infrastructure, use, and expenditure within the same country. They also state that public investments on education have some influence, although, not as remarkable.

Culture

Culture can enable people living in a certain area to start internet-based enterprise, if it encourages local entrepreneurs from different fields to collaborate with each other. It is also important that off line entrepreneurs are willing to adapt their business model in the way that it supports the needs of online entrepreneurs (Avgerou et al., 2011). On the other hand, culture can also be the source of innovation as is sometimes the case in urban areas (Foster & Heeks, 2010).

4.2 Factors in the individual level

Technological background

Mandatory technological requirements currently are a personal computer or smart device for the concrete application development work and internet access to publishing the application. However, the internet access is needed only once in a while and for example a community computer or internet access is enough. Therefore, unreliable internet connections in rural areas might hamper launching the product, but will not prevent it. It would also be convenient to possess access to a smart device because it would enable testing. However, this is not mandatory because application can also be developed and distributed without testing it on the real device.

Skills

The minimum requirements for skills to produce an application are fuzzy. The basics of English would be helpful as it is needed for using internet and most programming languages are more or less based on English vocabulary. However, no knowledge of English is needed in order to be able to learn complex skills with a computer (see Mitra & Rana, 2001, Mitra, 2003). Even hacking an operating system (see Negroponte, 2012), or learning a programming language can be achieved without knowledge of English. A potential application producer should know how to use a computer (or smart device) and internet and understand internet content. However, Mitra and Rana's (2001) results show that interested children can quite easily learn to use a computer and the internet.

Financial situation

Access to internet appears to be related to family income. Martin and Robinson (2007) studied in American context that likelihood of access to internet increased most slowly among individuals who belong to the lowest family income group. Hoffman and Novak (1998) found out than in USA those non-students whose family income is more than USD 40000, own home computer more than twice as often as those non-students, whose family income is less than USD 40000.

Social class

In USA, multiple studies have been made about race and its relation to digital divide. Hoffman and Novak (1998) revealed that whites own twice as often home computer than African Americans within non-student, whose family income is less than USD 40000, but owning home computer is almost as common within white and African American non-students, whose family income is more than USD 40000. However, African American students are less likely to own a home computer than white students despite their family income group.

Educational background

There are some studies, which indicate that person's educational background correlates with his or hers internet use. In USA, owning a computer and using internet was strongly associated with educational background among persons age 25 or older in the 21st century (NTIA, 2002). In accordance with these results, Fox & Livingston (2007) found that individuals, who have not graduated from high school, are significantly less likely to use the internet.

5. Discussion and conclusion

We argued that open marketplace would enhance the possibility of application vendors in developing countries to create sustainable business in their countries. From our initial study, we noticed that only a few top developers come from developing countries. Based on a literature review, we presented a conceptual framework which can be used in further studies to address issues hindering developing country developers to entry markets. Further studies are needed to analyse presented issues and to design countermeasures for them.

A few practical implications can be made. First, the ecosystem orchestrators should consider opening their marketplaces to a wider range of countries. Currently, some countries are prevented for publishing in the marketplaces due to different factors. Arguable, a larger pool of countries is entering the digital domain and there is a huge market for the taking. Second, even though the digital market is global, life is local. The ecosystems need to engage a pool of developers from a given region to be able to create localized content.

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TRANSPARENCY AS A CORE VALUE IN GOOGLE SEARCH

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Keywords
Google, Transparency, Personalization, Paradox

Extended Abstract
In this abstract I propose to consider Google's alleged value of *transparency* from a Foucaultian perspective. The basis of my interest and the foundation of my remarks on the algorithms can be found in Eli Parisier's 2011 book *The Filter Bubble*. This book is deemed indispensable seeing as no official insight into the more technical details of Google's use of algorithms is attainable.

The extent of web-personalization is especially obscure and nontransparent in Google Search. An assessment of the use of personalized filtering in the service is made highly complicated and positively impossible by the de facto secrecy and non-existing disclosure of both the techniques and algorithms in Google's search results. What is worse is the fact that Google fail to make the common user of the service aware of the mere fact that the results *are* filtered.

Google's renowned search system algorithm *Page Rank* turned back search results to its users based on how many sites referred to the linked site in question. Consider this a hypertext wisdom of the crowds-rank, where the number of referrals directly controlled the ranking of results. As Parisier shows, this is not the case anymore: two demographically similar women gets very different results on the same inquiry, founded on their previous click-histories[1]

Transparency is considered one of the key elements in Bozdag & Timmermanns[2]' overview on the ethical implications of the Filter Bubble: without transparency and disclosure, the filtering itself can be regarded as a threat to the autonomy of the user of a service. The fact that no information Is disclosed insinuating that your search results are a byproduct of your previous clicks is in this regard considered highly problematic, in that it comes across as a hidden and ubiquitous control mechanism that impairs rather than enhances the user's opportunity to obtain unbiased enlightenment on the Internet.

Transparency as a Core Value

The highlighted and increasingly well explained presence of the adverts in the top of the search results leaves the user with the idea that it is emphasized when a search result is biased. I propose that this contributes to a conception of the unmarked results being unbiased, objective even.

This along with the absence of information about the filtering will for many obscure the fact that the results are carefully tailored to suit the users' preferences.

Foucault's use of the term *Panopticon*[3] is easily applicable to the Google Search engine and the use of these obscure selective algorithms.

In a yearly publication from Google dubbed the Transparency Report[4], Google declares transparency to be one of its core values.

[1] Parisier: *The Filter Bubble* : 2011: 2
[2] Bozdag & Timmermanns: Values in The Filter Bubble : in Value Based Design Proceedings, dec. 6th, 2011
[3] Foucault, Michel: Overvågning og Straf: 1977: 169
[4] http://www.google.com/transparencyreport/

This *Transparency Report* allegedly discloses a full overview of the countries that have requested Google to remove content from its Service, and how many times this has occured during the previous year. Thus, the transparency Google facilitates is restricted to the filtering that Google executes on behalf of national third parties, and *not* the immense filtering practice that Google on its own premises executes every minute every day worldwide. In this regard it is obviously tempting to conclude that both the degree of impartiality and transparency seems somewhat questionable.

In a Foucaultian perspective one might add that this identification of the traditionally centralized bodies of power (the govenments) as the aspiring censoring parties,contributes to blurring the power mechanisms exercised by Google itself.

"At bottom, despite the differences in epochs and objectives, the representation of power has remained under the spell of monarchy. In political thought and analysis, we still have not cut off the head of the king." [5]

This I regard to be in compliance with a growing societal tendency in Denmark: the identification of the centralized power, the state, as the unwanted, paternalistic disempowering body of power, seeking to control the individual. A tendency that utterly takes away the focus from the more direct executors of power over our everyday: the private stakeholders practically regulating our behaviour. Thus, when we as a society, primarily on a financial basis, identify the attempts of the state to control our behaviour by issuing diverse taxes on sugar and tobacco as violations of free will, but fail to question the ever more present and still stronger hold of private service providers like *Google* over our every move, these services will continue expanding their power, dominating our existence. Hence leaving still less room *for* cette free will.

In terms of the panopticon the mere fact that our gaze still are locked upon the traditional watchtower, identifying the state as the primary controlling prison guard, the easier it becomes for these service providers to exercise invisible power over their users – and thus shape both the subjects and their lookout on the world.

Over all it seems quite the paradox that a service that holds power of a great many people's lookout to the Internet can claim Transparency to be a core value and reject to disclose which information they have on each user and thus, which reality the user is in fact shown – without affecting its integrity.

In Republic.com 2.0, Cass Sunstein[6] identifies the ever growing power of consumers to 'filter' what they see as posing a significant threat to democracy in the future. I do not think this holds true for the majority of Google search's many users worldwide. On the contrary, the overwhelming lack of transparency and disclosure with regards to the immanent processes of filtering leaves the users of the service highly disempowered. And that too poses a significant threat for society at large-

[5] Foucault, Michel: *Governmentality*: 1978: 88-89
[6] Sunstein, Cass: *Republic.com 2.0*: 2007: 5

ETHICAL IMPLICATIONS OF GOOGLE'S KNOWLEDGE GRAPH

Katrine Juel Vang

Abstract

This paper proposes to revise the changing role of Google Search in our everyday lives with the implementation of the *Knowledge Graph.* The Knowledge Graph represents a significant shift in the role of Google: Instead of supplying the user with links matching a given query, Google now provides actual answers to the queries of the user. From a pragmatic point of view the difference is subtle, and by view of convenience, this shift might even be considered positive. But from a view of knowledge as a justified true belief, it is indeed problematic if we increasingly rely on one secretive service provider as holder of the truth. I propose that this explicit reliance can be explained to some degree by the trusting culture of the Scandinavian countries, but find that also Google's expansion into other domains such as browsers and smartphones also holds a role in the consolidation of its power in our lives.

This contribution can also be regarded as an initiation of a critical discussion of the overall reliability of and the emphatic reliance on Google Search. By means of carefully selected examples the need for such a discussion is examined.

I strongly propose future quantitative and qualitative inquiries into the exact role of Google Search in users' lives in order to nuance these initial remarks from a user perspective.

Keywords

Google, Data, Knowledge, Knowledge Graph, Information, Trust, Culture, Education.

1. Google as the Disseminator of Truth

In this paper I propose to revise the changing role of Google in our everyday lives with the implementation of the *Knowledge Graph.*

This contribution must be regarded as partly an initiation of a critical discussion of the overall reliability of the service and by means of carefully selected examples as a way of justifying the need for such a discussion.

1.1 The Knowledge Graph

Who is to say what information is relevant? By a glance on search tools used in the West, Google is, and has been doing so for a long time. Google dominates Danish search with a share on a whopping 97% of all searches.[1] This is hugely in accordance with the general success of the service, which initially was powered by a significantly strong algorithm, PageRank. Since then the service has evolved into what Tavani defines as a web 2.0-era search engine by means of its use of personally filtered search results.

With the recent expansion of Google Search: *The Knowledge Graph*, Google exceeds its role as a mere conveyor and provider of multiple 'relevant' links from the internet. As shown in figure I below, The Knowledge Graph is a vast step towards the realization of former Google CEO Eric Smidths concept of Google's role in our world: "People want Google to tell them what to do next" [2]

[1] http://returnonnow.com/2012/06/search-engine-market-share-country/

[2] Parisier: 2011:

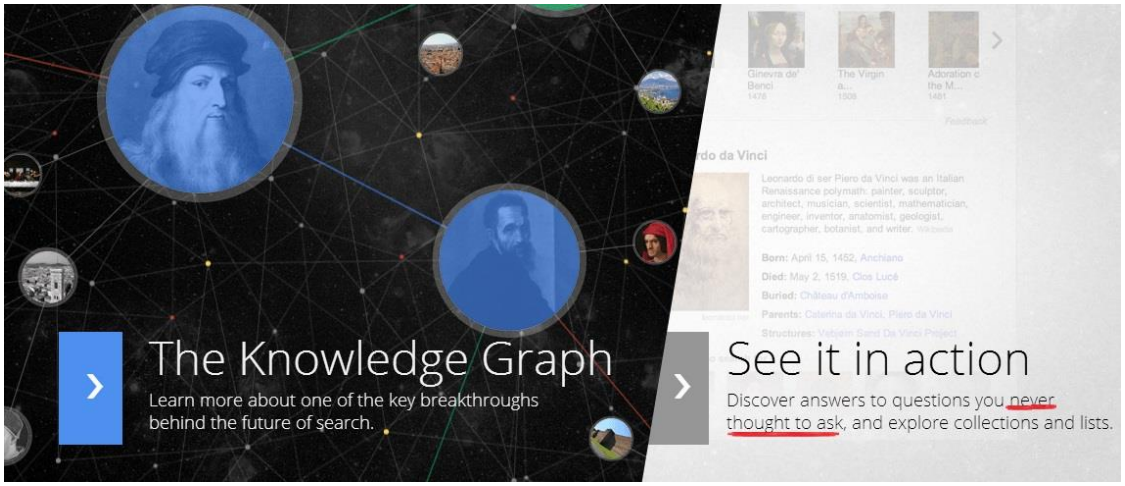

Figure I shows Google's presentation of The Knowledge Graph (my underlining): http://www.google.com/insidesearch/features/search/knowledge.html

The mere use of the term knowledge in this context builds on a very causal and acquisition-related view of knowledge. It is implied that simply by *googling* and thus accessing relevant pieces of information – the faster the better - you gain knowledge. In other words, there is no distinction between *knowledge* and *information*.

In approaching a definition of *what* Google offers if not regarded as actual knowledge the distinction made by Davenport and Prusak[3] in their noted book *Working Knowledge* is of some use. Google to this day is (one of) the World's largest stakeholders in the *data* business. However, Google Search does not just convey data; it cleverly manages to turn data into pieces of information even before the results to a given query are presented to the inquirer.

The *Page Rank* algorithm has until now, however opaque, calculated and categorized the data according to factors such as credibility and popularity of the websites and geographical knowledge and search history of the user. With *The Knowledge Graph* Google takes on the remainder of Davenport and Prusak's ways of distinguishing between *data* and *information*: The data is both *contextualized*, *corrected* and *condensed* in order to adequately and efficiently answer the user's question.

To conceive of Google as an intermediary of actual knowledge is still out of place. According to Davenport and Prusak the process of turning information into knowledge is aided by the processes of *comparison, connections, consequences and conversation*. The design of *The Knowledge Graph* does not inspire to neither compare nor connect the information condensed by Google to the multitude of alternative pieces of information on the web. Instead the user, by means of collaborative filtering in the anonymous '*People also search for'*, is called to stay on Google's site and keep clicking through the carefully condensed pieces of information.

This often repeated quote from my former boss highlights an important development in knowledge culture caused by Google: The downgrading of the *conversation*: "You don't discuss facts – you google them". If turning to Google in the future renders both the activity of surfing the web in looking for answers *and* traditionally fruitful activities such as discussion superfluous, then is it possible to consider the information obtained valid in terms of contributing to a knowledge culture?

Hinman[4] treats several problematic aspects of Google's powerful position in our society. A significant point made by Hinman is his emphases on the fact that search engines in their positions as gatekeepers of all the information on the web themselves contribute to - and are highly constituent of - much knowledge formed in the world today. Hinman notes that search engines like Google:

[3] Davenport and Prusak: 1998:
[4] Hinman: 2008

"…have replaced scientific and scholarly legitimation.." and are "providing a new *'Rangordnung'* of knowledge claims that replace traditional legitimation structures"[5]

Until now the pursuit of information by use of Google Search has resulted in various more or less personalized links matching a given user's query, leaving the user with a ranking of possible search results to access and assess. The multitude of links provides the user with the ability to visit several sources that hold several pieces of information on the given query and thus ideally makes grounds for what Sunstein[6] would call 'decent opinionformation'.

By presenting the user with answers to a given query *on* Google's search page the probability of the user visiting other sites than Google's is vastly diminished. This is a problem from both a democratic and an ethical perspective. Democratically it is inconceivable that the user by solely receiving its answers from Google obtains a diverse and nuanced lookout on the accessible information on the Web. One might add that this is nothing new: Google has been disseminating and ranking these pieces of information all along. But *The Knowledge Graph* holds a significant difference, if not in kind then in degree. Users no longer need to click any of the external links provided by the search engine in their pursuit of information. Burrus notes[7]citing Vanevar Bush that the purpose of *hypertext* itself originally was to cater to the organic, often non-linear workings of the human brain in accessing information. In this respect I hold it plausible to consider *The Knowledge Graph* as a step back in a learning perspective. Google's search before *The Knowledge Graph*, though not unbiased, served as a looking glass, a starting point of access to the vast content of the Web. Regardless of the extent of personalization and filtering in the search results, Google serving as a gate keeper *has* been about letting people *through* said gate. Now in fact users can just go *to* the gate, 'ask Google' and receive their answers without ever entering the gate.

Benkler notes that user autonomy can, in fact, be threatened by the vast masses of otherwise inaccessible information held by the Internet and, de facto, search engines provide a degree of autonomy by helping the user tame and access the desired information. But, as held by Bozdag and Timmermanns, transparency is also an important factor in user autonomy.

As for now *The Knowledge Graph* is in an early phase of implementation – Google still lets its users provide feedback to the graph's propositions. One ethical concern that is traditionally applied to the neutrality of search results[8] is the fact that it is not disclosed explicitly, that the information highlighted *is this:* propositions – and not universal truths to a given query. An important distinction that is likely to be even harder to make following *The Knowledge Graph*.

2. The Role of Google in Denmark

2.1 A Trusting Culture

As Van den Hoven remarks, the Scandinavian countries generally hold a large degree of trust towards in supplying i.e. governmental institutions with our personal data. In the Danish society at large there has been a growing skepticism towards the public sector in later years, partially I think due to the increasing focus on the benefits of privatization. Still I hold that most Danish citizens possess a large degree of trust and a sense of liability– both towards the public health system and the financial sector, both of which we somewhat gladly provide with our private details of illnesses and income.

I have a strong conviction that this trust is of great importance and benefit to our society. My question is, if this culture of trust is as primarily beneficial when it comes to handing over information to private services on the internet. Surely, people are mostly very cautious when they access sites that

[5] Hinman: 2008: 67
[6] Sunstein: 2007:
[7] Burrus: 2007: 21
[8] http://plato.stanford.edu/entries/ethics-search/

require their banking information, and I sense a greater awareness is dawning with regards to *cookies* on sites which formally demand personal data of various kinds. But can we expect the many daily users of Google's search engine to show this degree of cautiousness?

In Denmark as in other countries the mere term 'googling' is used for the activity of looking up information on the internet as such. This emphasizes nicely the degree to which the Google Search service has colonized the Danish web culture. What is all the more conspicuous is the degree of reliability with which the service and its results are regarded. In most Danish colleges, universities, and so forth, we are taught to be profoundly sceptical and cautious when accessing information on a site like Wikipedia. This does not apply to Google.

From the viewpoint of integrity –and democracy - it is remarkable, that a site like Wikipedia, an anti-commercial, multinational collaborative database is frowned upon, when a mainly American commercially founded company like Google is met with the utmost of trusting reliability.

One of Google's most recent endeavors into expanding its Search-service is the so-called Knowledge Graph where Google is now contributing pieces of information on its search site instead of just providing the user with external links. This initiative is seemingly just another step on the path towards achieving a more semantic web, and honestly, from a convenience-perspective seems to be beneficial for the site's users, who will in many cases save time by means of not having to look further than to Google for the answers to their inquiries. This surely calls for a degree of concern, especially given the emphatic positive consensus and degree of liability Google is considered with in today's Danish education system.

Will we still with the implementation of *The Knowledge Graph* allow for the students to utilize Google as a source of basic information from middle school through college while consistently frowning upon the same use of Wikipedia?

As the search illustrated beneath for information on American icon Chuck Norris reveals, it shows to be quite challenging to trust the site with conveying valuable pieces of information. Surely, the alleged 'fact' that Chuck Norris' tears can cure cancer, can be thought of as pretty funny in light of the somewhat mythical phenomena he has grown to be within the last five years, namely in internet culture. And Google is often conceived of as a funny and quite geeky, positive brand. But when it comes to allegedly conveying facts, and you have a brand this powerful and trusted worldwide, there is no excuse for not taking the part of being one of the initiators of the future semantic web seriously. And in this context we must ask ourselves if this joke would have held its ground for any longer than a few seconds on a collaborative site like Wikipedia, which, all things equal, is renowned for its hasty editing.

In light of how massively used and trusted a service the Google Search is in our country, we are forced to set some standards for the use here of – or at least invite back some degree of skepticism in the approach to the service.

Vincent Hendricks and Pelle Hansen completely dismisses Wikipedia in their 2011 book Oplysningens Blinde Vinkler,[9] based on the (misinterpreted) premise that Wikipedia's information is invaluable in comparison to the traditional knowledge production in research practices based on peer-review. My point is that it would seem more legit to trust a globally founded anti-commercial 'wisdom of the crowds-based site with millions of contributors to be the public's primary source of information, rather than to place our knowledgeable futures in the hands of a Silicon Valley-based and utterly commercial cooperation with merely a thousand employees.

[9] Hendricks, Vincent & Hansen, Pelle*: Oplysningens Blinde Vinkler*, 2011: 145pp

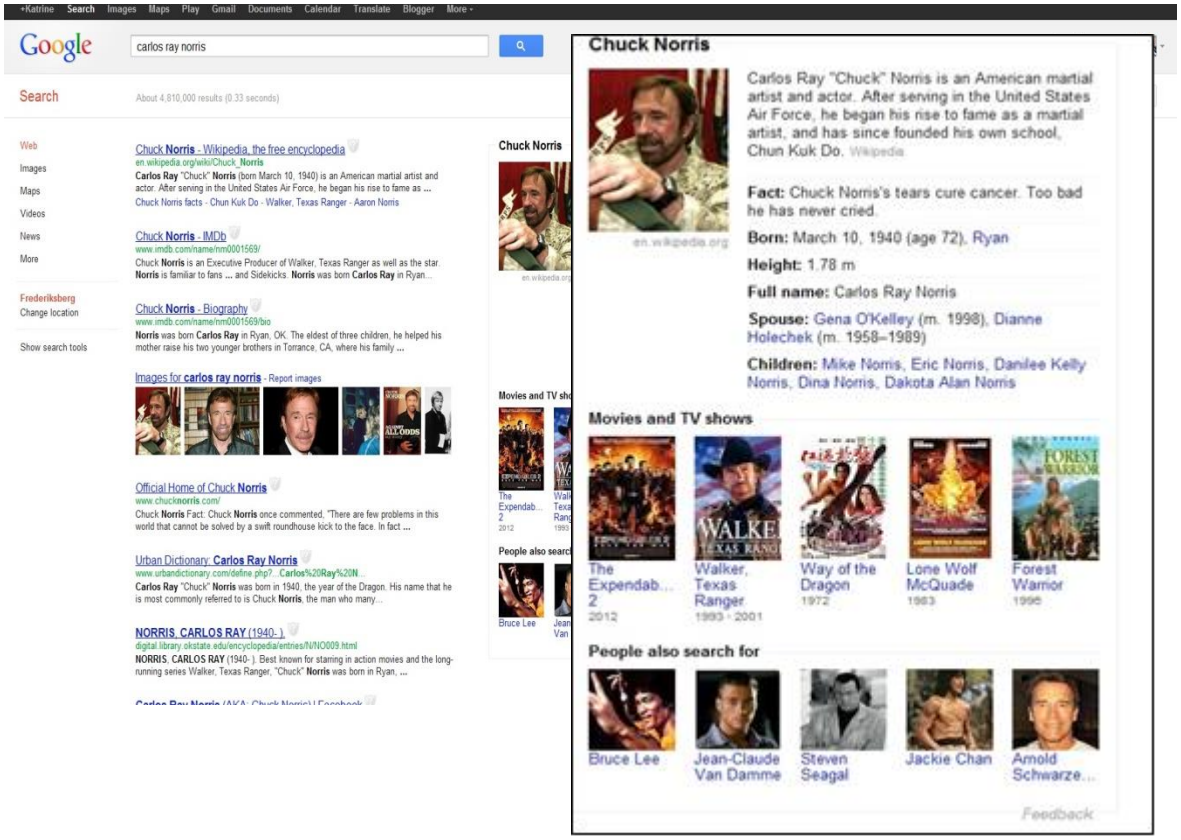

Fig. 2 shows a Google search on the actor and phenomenon Chuck Norris after the visual implementation of The Knowledge Graph to Google Search. Note what it says under 'fact'.

3. Concluding Remarks

The role of Google is ever growing with the service implemented in a great many browsers worldwide, and the growing popularity of its own browser, Chrome, makes googling still easier and increasingly more convenient. While it is adamant for the future of a knowledgeable and democratic society to bestow on its citizens a certain level of criticism in relying on the results of search engines, it is plausible that the notion of a culture of trust and the ever growing insistence on convenience and immediate access to information in combination with the commonsensical and ubiquitous character of Google's services, their dominance will be hard to ignore for even the most enlightened citizens. The implementation of *The Knowledge Graph* may seem rather innocent and by means of convenience it is certainly positive that the user is spared at least one click in the somewhat tedious activity of information retrieval. *The Knowledge Graph* represents a significant change in the role of Google. Until now, Google has simply disseminated links, albeit these links are sorted in a more or less conspicuous manner and may be filtered accordingly, but still, they were links to websites that to a certain degree matched the query of a user – representing *possibilities*, allowing the users to choose themselves which of the results to examine further and which to dismiss. Now Google itself represents *answers* to the queries – instead of introducing the user to a range of possible sources, Google is the source. This calls for a revision of whether the autonomy of the users is impaired by this selection process, and the responsibilities of Google by means of its de facto monopolistic character.

As Walter-Echols notes: "Ultimately, the power Google has to know us and shape how we use information is emblematic not of their corporate ambitions, but of the power of information, and the general public's carelessness with its use."[10]

[10] Walter-Echols: 2009

We must indeed govern our trusting culture, but while doing so we are, pending the full implementation of the *Knowledge Graph* certainly well advised to revise the status obtained by Google Search in our knowledge culture.

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HOW TO RESIST THE HYPERMORALIST TEMPTATION IN COMPUTER ETHICS

Richard Volkman

Abstract
Ethical discourse becomes "hypermoralistic" when some values or principles inspire a religious attitude is not shared by one's audience. To avoid this, it is necessary to address one's audience in terms of what they already profess. Computer ethics as professional ethics is especially well-suited to such appeals.

Keywords
virtue ethics, hypermoralism, professional ethics, Kierkegaard

1. Introduction

Several prominent philosophers, from 19th Century thinkers like Søren Kierkegaard and Friedrich Nietzsche to contemporary authors including Bernard Williams, Martha Nussbaum, and Philippa Foot, have called attention to a tendency among philosophical ethicists to treat morality, as defined by their particular theories, as something opposed to and constraining of the basic human pursuits that constitute rich and meaningful lives. These authors contend theorizing tends to set up morality as an obstacle to flourishing, leading to a disdain for and alienation from morality. Any such a theory will sound "hypermoralist."

Since hypermoralist discourse appears ridiculous, pompous, and ultimately hypocritical, we have good reason to avoid it. Kierkegaard's analysis of aesthetic, ethical, and religious attitudes helps to identify an important source of hypermoralism in a clash of professions of faith. Professionals, including computer professionals, are defined by what they profess. In light of this, ethicists can encourage right action by appealing to those antecedent commitments that are internal to the projects and pursuits of the profession. We thereby encourage our students, colleagues, and clients to a heightened moral sensitivity without making morality the enemy of meaning and the good life. This strategy is available to any ethical perspective that is willing to admit the degree to which its central doctrines are embraced in a manner more analogous to religious inspiration than rational judgment.

2. What is hypermoralism?

By "hypermoralism," I mean discourse that strikes its audience as endorsing a narrow, outlandish, or overblown conception of morality. In general, hypermoralism sounds ridiculous, pompous, or hypocritical, which inspires satire and derision from the audience. So we have exaggerated religious moralism skewered by Saturday Night Live in the character of the Church Lady finding "Satan" behind every imagined deviation from her narrow conception of the true, the beautiful, and the good, and we have self-righteous environmentalism lampooned in South Park where the purchase of Prius hybrids leads to a reduction of smog while issuing in an even more dangerous and noxious expanding cloud of "smug" produced by the green consciousness of drivers who have come to enjoy the smell of their own flatulence. Anyone who doubts that audiences react strongly against what they perceive to be hypermoralism should Google the phrase, "Peter Singer is a hypocrite." You will find thousands of comments confirming that extremist moralizing is liable to disgust and alienate an audience, who will detect in the hypermoralist's exhortations to a lofty and uncompromising sense of morality a challenge to prove that no none, not even the speaker himself, really believes or lives up to the sort of nonsense his rhetoric demands.

It should be emphasized that the audience's point of view is essential in identifying discourse as hypermoralist. Singer is sure to receive a much warmer reception in a room full of committed

utilitarians or activists. Indeed, in that context the audience is liable to be egging him on to go farther, with certain elements engaging in moral one-upmanship to express their greater sanctimony with respect to the cause. So it is heard in certain environmentalist circles that the only final solution is the extinction of the human race itself; admitting any less radical solution is taken as evidence of one's lack of commitment to the cause. The Voluntary Human Extinction Movement website declares, "We're really vehement." More moderate voices are apparently not vehement, or at least not *really*. In the context of one's immediate tribe, one's ridiculously extreme views may come to seem positively mild, and one's own hypermoralism may become invisible to one's self.

Although many of the worst examples of boundless hypermoralism escape the lips of rudely uneducated and unthinking bigots, provincials, fanatics and gung-ho activists, it cannot be denied that the phenomena is utterly pervasive in the more quietly polite debates among philosophers and especially ethicists. Among philosophers, the ruthlessness of one's dialectic is often not merely tolerated but celebrated. It seems that reasoning and theory can tend to abet rather than discourage hypermoralism.

Utilitarianism may be especially prone to this sort of extremism. The theory is so relatively simple and clear, and it extends itself so readily into every nook and cranny of one's behavior and character that it lends itself to following its implications without regard to considerations that do not fit the theory. Shelly Kagan (1989) ultimately welcomes the label "extremist" and argues from a very few premises that the iron logic of morality demonstrates there can be no limits on the demands morality heaps onto an individual, that each and every human action really is bound to advance the utilitarian "overall good" if it is rational, and rational if it is moral, while each and every desire, preference, or whatever else one's value theory takes to constitute the good of each and every sentient being is equally a candidate for consideration in the tallying of the overall good. By Kagan's reckoning, if anyone in the room right now (or anywhere else) wants a cup of coffee (or whatever), that is, ipso facto, a reason for me to provide him or her with that coffee (or whatever), and since I am morally obligated to do whatever I have most reason to do, I am morally obligated to provide this person with coffee in case there are no other more pressing reasons at hand in a complete accounting of the overall good. Of course, since there are billions of humans each with thousands of desires, many more pressing than the desire for coffee, not to mention the countless other species whose desires, preferences, or whatever count in the tallying of the overall good, we can rest assured that the particular desire of any particular person for a cup of coffee will almost never be a conclusive reason for binding one's action. That may seem to lessen the impact of Kagan's extremism, until it is noticed that this exact logic applies even if it is you who wants a cup of coffee. In the world as it actually is, your own desires will almost never count as a decisive reason for action in light of all the other things you could and therefore should (no, morally *must*) do on Kagan's account.

Is it really credible that, of all the things you could be doing with yourself right now, reading this obscure screed about hypermoralism has the greatest possible impact in improving the overall good, such that you are bound to continue reading? If you agree that this is not credible, but you continue reading, then Kagan's argument (or at least my gloss of it) appears to you as so much hypermoralism. Either you do not take the account seriously as an accurate description of what morality demands, you do not take morality seriously because you are alienated by moral extremism, or perhaps you are a hypocrite (like Peter Singer).

However, hypermoralist rhetoric makes it rather uncomfortable for anyone sincerely committed to morality to raise objections against hypermoralism. Just as the proponents of human extinction are eager to declare that alternative solutions are less serious about the cause, Kagan styles those who would reject his arguments as proponents of "limits" to morality, intimating that they must not really take morality very seriously. Moral discourse tends to encourages one-upmanship. Nor is it something peculiar to utilitarianism that issues in hypermoralism, for it was Kant (1797) who penned a screed denouncing in the most absolute terms any act of lying and who (1796) advises that morality requires one to hurriedly execute convicts on a sinking island rather than leaving them to drown, since justice requires their execution and not merely their deaths.

The apparent extremism of so much moral theory has been criticized by a handful of philosophers over the years. Most notoriously, Nietzsche openly advocated "immoralism" in his ethics, and thereby

disarmed any attack along the lines that his ethics was insufficiently serious about "morality" (it should be noted that Nietzsche rejects *morality* not all of *ethics*). Others have contended that the problem of hypermoralistic extremism is not an expression of excessive concern for morality but rather an overly narrow focus on one or another corner of morality and ethics to the detriment of the whole. Philippa Foot (1988) argues that utilitarianism amounts to treating beneficence and the good associated with that virtue as the only concern of moral or ethical persons, extending the logic of that legitimate moral consideration beyond all reasonable bounds. Similarly, Martha Nussbaum (1990) indicates that utilitarians and Kantians alike, driven by the ideals implicit in abstract theorizing that elevate ruthless rationalization and formalizing into categorical commands of reason itself, tend to suppose all human goods must be commensurable and susceptible to a dispassionate and philosophical description, and this leads to a significant truncation of the sorts of moral concerns that persons encounter in their concrete, historically bound, and emotion-laden observations of the true, the beautiful, and the good. Significantly, each of these authors suggests that a robust virtue ethics might remedy the hypermoralism of moral theory. Bernard Williams (1985) takes a slightly different tack, arguing that there is something deeply mistaken in the philosophers' attraction to theorizing itself when it comes to morality, and this will extend even to virtue ethics if it succumbs to the temptation to theorize. Theory, he contends, cannot help but alienate us from morality, since it is apt to posit moral values that are external to the immediate concerns, projects, values, and desires that constitute our very persons. Williams (1976) wonders how it could be reasonable for an agent to give up, "in the name of the impartial good ordering of the world of moral agents, something which is a condition of his having any interest in being around in the world at all."

This suggests that virtue ethics or anti-theoretical ethics may avoid hypermoralism. However, rather than taking sides with respect to one or another account of ethics, we should like to get at a more general account of why ethical discourse so often prompts us to take sides and why this so often leads us to making claims that are hypermoralistic. In light of such an account, we can try to discover a practical method for introducing ethics of all sorts without alienating our audience with hypermoralism. I contend that such an account can be advanced by considering the problem in light of the ideas of Søren Kierkegaard.

3. The Religious in Ethics

Kierkegaard is conceived not as an ethicist but as a religious thinker. I will argue that his depiction of the human condition is illuminating precisely for its religious character. To understand why hypermoralism happens, we need to appreciate how humans are compelled to find meaning in profound commitment, a commitment that tends to issue in behavior that will appear as a "teleological suspension of the ethical" to anyone who does not share those convictions. It should be emphasized that this discussion is inspired by Kierkegaard and will deploy his terminology, but nothing here is intended as a scholarly or nuanced statement of Kierkegaard's actual views. However, a cursory treatment of certain of Kierkegaard's key ideas can help us to understand the motives and scope of much hypermoralistic discourse.

Kierkegaard categorizes ways of life according to what each regards as valuable and the relation between valuer and value. The three basic ways include the aesthetic, the ethical, and the religious.

The aesthetic way of life embraces a kind of hedonism, but it takes the opposite of pleasure to be not pain but boredom. The aesthetic is driven to constantly seek out new and varied experience, and even the painful can be embraced insofar as it adds spice to life and keeps one interested and engaged. There is the strong intimation that all this bustling and jolly frenzy in the pursuit of random isolated desires and intrigues serves not so much to increase the overall sum total of pleasure and stimulation in one's life as to distract one from the fundamental fact that one's life is utterly devoid of any real meaning or purpose and the anxiety this fact provokes. Unfortunately, for the aesthete, the "rotation method" of constantly changing up the sources of one's stimulation and thereby never becoming deeply committed to any one aim or pursuit, value or person, which is required if one is to avoid the inevitable boredom that will surely follow from any lasting conviction or project, can only distract one from the crisis of meaning for so long, and when anxiety ultimately catches up with the aesthete, the

rotation method will have made his life that much more empty and devoid of purpose. In the character of Johannes the Seducer, we read the inevitable lament of the aesthete: "My life is absolutely meaningless. When I consider the different periods into which if falls, it seems like the word Schnur in the dictionary, which means in the first place a string, in the second a daughter-in-law. The only thing lacking is that the word Schnur should mean in the third place a camel, in the fourth, a dust-brush" (Bretall, 1946:34).

The ethical way of life seeks to avoid this unfortunate fate by attaching itself to philosophy and the eternal verities revealed by reason and an intellectual conception of one's self from the point of view of the universe. It is the way of theory and principle, and it escapes the difficulties of the aesthetic by finding meaning in such institutions and practices as conjugal marriage and the community of good society, conceived as among the worldly expressions of ultimate and eternal truths. However, the ethical does not ultimately succeed in staving off the crisis of meaning. Human reason and theory are fragile and finite instruments, insufficient to the task of revealing once and for all what is truly infinite and eternal. Reasoning operates by way of "approximation," such that the ethical person never quite gets to sincere belief: "Anything that is almost probably, or probably, or extremely and emphatically probably, is something he can almost know, or as good as know, or extremely and emphatically almost *know*--but it is impossible to *believe*" (Bretall, 1946:221). Moreover, the limits of reason ensure that one's commitment to whatever truths one almost knows and therefore almost believes will forever be incomplete; one must always remain open to new evidence that might point in a different direction and to the real possibility that everything one has (almost) believed has been mistaken. Meaning demands a settled certainty reason cannot deliver.

On Kierkergaard's view, our only option to finding meaning in life is to adopt a religious attitude. The religious consists in an unconditioned, passionate, and personal relation to the infinite. It should be emphasized that the religious nature of a belief is not given by its content, but by the depth of commitment that one has to it and the role it plays in one's life. This is what Kierkegaard is getting at when he discusses "truth as subjectivity." This is not advanced as an alternative theory of truth, and it is emphatically not saying that whatever I believe is true is "true for me." Rather, it is like "true" in phrases such as "true love." That this sense of truth coexists alongside some notion of objective truth is evident when Kierkegaard proclaims, in comparing the Christian who pays mere lip service to religion and the "savage" who worships an idol with a religious attitude, "The one prays in truth to God though he worships an idol; the other prays falsely to the true God, and hence worships in fact an idol" (Bretall, 1946:212). All the same, Kierkegaard suggests that some doctrines are more capable than others of sustaining a truly religious conviction, and that Protestant Christianity is especially well suited to the religious attitude. However, we can accept the basic idea behind Kierkegaard's notion of the religious while lamenting with Nietzsche the "death of God," occasioning a renewed existential crisis. Something like this seems to be behind Nietzsche's lifelong wrestling with the problem of nihilism, and his solution is emphatically religious in its attitude: "it is not the works, it is the *faith* that is decisive here, that determines the order of rank…*The noble soul has reverence for itself*" (Nietzsche, 1886:228). The death of God does not vitiate our need for the religious attitude; it just makes it that much harder to find a fit object of religious commitment.

If Kierkegaard's diagnosis of the human predicament is even roughly correct, then it is no surprise that ethical discourse slides from being (in Nietzsche's phrase) "absurdly rational" to hypermoralistic. If there is something existentially unsettled about the ethical point of view and its method of approximation and best guesses, there will have to be a leap to the more satisfying religious attitude wherein one regards the whole world through the lens of one's favored doctrine. Once the world is perceived through such a lens, it becomes very difficult if not impossible to say how things seem to one in all sincerity and from the inside without seeming to others to be speaking an outlandishly alien tongue. From the ethical point of view, such discourse will be perceived along the lines of a "teleological suspension of the ethical," a notion Kierkegaard illustrates with the example of Abraham's willingness to sacrifice his son Isaac at the command of his God. From the religious point of view, such a willing abandonment of the standards of morality will be perfectly comprehensible, even as the ethical point of view will see it as ridiculous or outrageous. Any explanation Abraham offers will sound hypermoralistic to an audience that does not share his religious attitude.

It seems one source of hypermoralism is a clash of worldviews grounded in different commitments regarding the true, the beautiful, and the good, where these commitments inspire the religious attitude that grounds a meaningful life. Although these commitments may not be traditionally "religious" in content, they are embraced with the religious attitude. Since religious commitments are not readily susceptible to appeals of reason (which is exactly why they ground meaning better than the ethical attitude alone), your commitments are liable to seem outlandish to me and mine are liable to seem outlandish to you.

4. An ethics of what one professes

This suggests two strategies for avoiding hypermoralism in computer ethics. On the one hand, virtue ethics and anti-theoretical perspectives tend not to be hypermoralistic. They are internalist accounts of ethical reasons, appealing to values that constitute one's flourishing rather than transcendent principles or aggregations of the "overall good" standing over and above one's antecedent interests and projects, and this rules out the sort of alienation from morality we associate with hypermoralism, even though being an excellent person on one's own terms is as demanding and unlimited as any alternative. "If any one imagines that this law is lax, let him keep its commandment one day" (Emerson, 1841). If the demands of morality are constituted by what I demand of myself in all sincerity, such demands will not appear ridiculous or pompous unless I seem ridiculous or pompous to myself, and they will not suggest hypocrisy insofar as they are sincere expressions of my own interests in my own voice. Such an approach may elevate personal excellence to a religious principle, but it does not require others to accept any particular religious commitments. Whatever your religious project, the virtues teach that you should pursue that project with integrity, courage, honesty, temperance, etc., and the virtues are never at odds with your pursuit of your religious project. They are the means to its realization in you.

However, understanding the religious dimension of hypermoralism also highlights a solution for proponents of other moral theories. If one's audience already shares or can be brought to share the core doctrines that the moral theory treats with something akin to a religious fervor, then hypermoralism can be avoided. It so happens that computer ethics as professional ethics is especially well positioned to adopt this strategy.

The root of "profession" is "profess," which means to affirm something with the sort of commitment we associate with the religious. Although we associate "professional" today mostly with medical doctors and lawyers, it is no surprise that the first occupation to be so described was the clergy. It is also fitting that those who teach ethics typically go by the name "professor." We are in the business of sorting out what folks profess and why. If we attend to this, we can set out to inspiring our audiences to recognize and live up to their own religious convictions instead of treating morality as an external and potentially hostile and limiting force. As in the case of virtue ethics, morality is transformed from being a constraint on what one would otherwise wish to do to being a path to self-realization on one's own terms.

Although it may sound hypermoralistic to a general audience to declare with Stallman (1991) that, "Signing a typical software license means betraying your neighbors," or to affirm with Floridi (1999) that "any form of reality (any instance of information), simply for the fact of being what it is, enjoys an initial, overridable, equal right to exist and develop in a way which is appropriate to its nature," the audience of computer professionals may be especially receptive to the core doctrines of these thinkers in virtue of computer professionals' own antecedent commitments to the technological project and the value of information. In that case, what would be hypermoralistic before another audience may express the constitutive doctrines of the profession.

It is left to the proponents of these erstwhile hypermoralisms to show they can win over converts or that the profession is already a clergy of information and by what means. Perhaps there is an important role for art, poetry, literature, and other sources of inspiration in getting students and colleagues to recognize, appreciate, and endorse what are ultimately religious commitments. However that may turn out, it is clear enough that converts cannot be won over by brute force of reason alone. Understanding the religious nature of so much ethical discourse helps to explain why and suggests a way forward.

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PRIVACY, THE THEORY OF COMMUNICATIVE ACTION AND TECHNOLOGY

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Abstract
Privacy is undergoing a reifying integration with regulatory and technical systems. This paper reviews privacy theory and Habermas's Theory of Communicative Action (TCA) in order to inform two analyses of two technological concepts: an RFID identification scheme and Privacy-Preserving Data Mining. The first analysis seeks to establish whether each technological concept is consistent with privacy theory. The second analysis is informed by the first and it applies the truth, rightness and authenticity validity claims of the TCA. These analyses find that these technological applications may rest on reasonably strong claims to validity with respect to data security and data confidentiality. However, these analyses also find that these technological fields have weak claims to validity with respect to privacy when it is distinguished from data security and data confidentiality.

Keywords
Privacy, Information Technology, Theory of Communicative Action.

1. Introduction

Privacy is a complex concept, influenced by a range of factors. It continues to be scrutinised and debated within the research community. While understandings of privacy continue to evolve, technical developments proceed and, in some cases, are predicated on views of privacy that are poorly understood, vague or conflated with other concepts.

Yet, privacy has been under scholarly debate since the 1970s. Early theoretical research argued the provenance of the right to privacy (Rachels, 1975, Reiman, 1976, Scanlon, 1975, Thomson, 1975) and early quantitative research supported the development of a theory of privacy based on a layperson's capacity to control their data (Marshall, 1972, Westin, 1970, Westin et al, 1979). Since then, several other privacy theories have emerged: the restricted access theory (Moor, 1990), integrative theories (Allmer, 2011), the theory of propertised privacy (see for example Schwartz, 2004), the contextual framework of information privacy (Nissenbaum, 2004, 2009) and the ontological theory (Floridi, 2005).

It may be that these privacy theories can inform analyses of technologies that claim to support privacy. Such analyses may contribute new findings with respect to technology and privacy. This paper presents an attempt at such an analysis.

The six privacy theories listed above are reviewed. The review provides a foundation for analysing two technologies, an RFID identification scheme (Vaudenay, 2007) and Privacy-Preserving Data Mining (Agrawal and Srikant, 2000). The analysis focuses on whether each technology is consistent, neutral or inconsistent with each privacy theory. Then, the first analysis informs a second analysis of the technologies' claims to validity (with respect to privacy theory) under Habermas's Theory of Communicative Action (TCA) (Habermas, 1985).

The paper proceeds as follows. Sections two and three briefly review relevant theory and sections four and five present the two analyses. Section two reviews privacy theory to provide a foundation for the first analysis. Section three very briefly summarises the TCA in an attempt to explore the interplay between information privacy and the TCA, and to provide a foundation for the second analysis. In Section four, the two technologies are analysed with respect to the six privacy theories. Finally, section five applies the validity claims of the TCA in order to analyse and establish the validity of these technologies with respect to privacy theory, finding that while these technologies may have validity in terms of data confidentiality or data security, their validity claims with respect to privacy theory is limited. In section six, the paper concludes that, when designing privacy technologies,

conceptualising privacy with respect to privacy theory may lead to higher levels of validity. The conclusion then suggests that valid privacy technologies may be more likely to support privacy preferences arising in the lifeworld as well as instrumental system goals. Finally, further research opportunities are noted.

2. Privacy theory

Emerging technologies have disrupted and challenged understandings of information privacy. Legislative approaches to privacy date from 1948, when the United Nations adopted the Universal Declaration of Human Rights (UDHR), Article 12 of which states "No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks upon his honour and reputation" (United Nations, 1948). Since the UDHR other regulatory approaches have been adopted, examples include directives on privacy issued by the European Union. In addition, case law has been influential. For example, in Griswold v. Connecticut the Supreme Court of the United States ruled that the right to privacy was protected under the constitution (Kelbley, 2006); and in Jones v. Tsige the Ontario Court of Appeal found that Canadian common law recognises a tort of intrusion upon seclusion (Hunt, 2011).

Privacy theory, at the same time, has been an expanding field of research since the mid 1970s. Scholarly debate was catalysed by a series of papers: Thomson (1975), Scanlon (1975), Rachels (1975) and Reiman (1976). Since this opening debate, privacy theory has been under continual discussion and several themes have been identified by those reviewing the field (Allmer, 2011, Fuchs, 2011, Tavani, 2007, Tavani, 2008).

There appears to be agreement that the restricted access, control and integrative theories are of significance. In addition, privacy has been conceptualised as a property right in a market that places value on personal information (Hui and Png, 2006, Schwartz, 2004, Thomson, 1975). Finally, a contextual framework (Nissenbaum, 2004, 2009) and an ontological (Floridi, 2005) theory of privacy have been proposed. This section briefly reviews and summarises privacy theory. While critique of privacy theories exists, it is omitted because it is superfluous to this paper's main theme: the analysis of two technological concepts with respect to privacy theory followed by the application of TCA validity claims (Sections 4 and 5).

2.1 Privacy theory

Westin's (1970) early theory of privacy as control over information is contrasted by Moor's theory of restricted access to information (Moor, 1990). The control theory of privacy defines privacy as the ability for an individual to control when, how and to what extent their personal information is communicated with others. Under this theory, if an individual has control over their personal information, they have privacy. Whereas, the restricted access theory (Moor, 1990) is premised on an understanding of how personal information can proliferate once it is disclosed. Therefore, the restricted access theory identifies a requirement for regulatory frameworks. Integrative theories of privacy combine the control and restricted access theories (for a review of integrative theories see Allmer, 2011).

Models of privacy as a commodity in a market that places value on personal information exist (Hui and Png, 2006, Schwartz, 2004, Thomson, 1975). Thomson (1975) suggested that the right to privacy is derived from other rights, such as the right to ownership of property and any rights over the person (for example, the right not to be looked at). Rachels (1975) disagreed with Thomson's (1975) view that the right to privacy can be derived from other rights and Reiman (1976) countered Thomson's view, arguing that the rights from which the right to privacy derives can be as readily conceived as derived from the right to privacy. However, this early debate did not curb the deployment of technologies that disrupt privacy. Rather, the incentive to collect and leverage personal information was sufficient for disrupting technologies to gain traction. In response, there have been arguments calling for a regulated market for personal information (Hui and Png, 2006, Schwartz, 2004).

The contextual framework (Nissenbaum, 2004, 2009) accounts for social and cultural privacy factors (for example see Lawler and Molluzzo, 2011, Reay et al, 2011, Wang et al, 2011), highlighting the relevance to information privacy of social norms arising from interests in dignity, autonomy and reputation. The contextual framework identifies information flows which, according to social norms, are appropriate for a given context. Nissenbaum states that privacy "… amounts to … a right to contextual integrity and what *this* amounts to varies from context to context" (Nissenbaum, 2009, p 127, Nissenbaum's emphasis). Lastly, the contextual framework supports the assessment of new technologies with respect to privacy: if an information flow disrupts the normatively established integrity of a context, privacy is likely to be at risk.

Finally, Floridi (2005) proposed the ontological theory of information privacy as a feature of the ontological model of information ethics. The ontological theory states that the availability of information privacy is dependent on the friction of the infosphere (Floridi, 2005); if there is more friction, information cannot move as freely and therefore there is more privacy, and ICTs can either increase or decrease the friction of the infosphere.

3. Privacy and Habermas's Theory of Communicative Action

While the restricted access and control theories support privacy to an extent, insufficiencies must be noted and mitigated. Integrative theories of information privacy attempt to combine the best features of the restricted access and control theories. Property theories marginalize valuable dimensions of information privacy; overlook (or perhaps disregard) the constitutive relationship between a person and their personal information. Under insufficient regulation, a market for personal information may establish a power asymmetry in favour of the party acquiring personal data, to the detriment of other participants in the market; and even with sufficient regulation, will enable those who control larger amounts of financial resource to have more privacy in practice than the poor.

The contextual framework and ontological theory of information privacy may be complimentary, but the contextual framework is more robustly consistent with findings (Lawler and Molluzzo, 2011, Reay et al, 2011, Wang et al, 2011) that privacy preferences emerge from and inform cultural and social norms: a person's privacy expectations may be different from one context to another and are shaped by that person's experience of everyday life.

While scholarly debate of the contextual and ontological theories of privacy continues, there remains an opportunity to contribute new perspectives. For example, everyday life is a key component of Habermas's Theory of Communicative Action (1985), which articulated two aspects of society: the system and the lifeworld (as reported in Finlayson, 2005, Horster, 1992, Thomassen, 2010). In his theorising, Habermas focuses on social systems and subsystems. However, his themes resonate when considering information privacy. This section summarises Habermas's Theory of Communicative Action (TCA) and explores the interplay between privacy and the TCA with a view to applying the validity claims of communicative rationality in Section 5.

3.1 The TCA

Succinctly[1] and according to Finlayson (2005), Horster (1992), Livingstone (2005) and Thomassen (2010), Habermas's TCA characterises the ways in which secular humanitarian ideals can inform the construction of social reason. The lifeworld and the system filter these ideals and lead to an increasing reliance on communication for the perpetuation of social harmony.

The lifeworld encompasses the informal, unregulated aspects of everyday life. The lifeworld shapes, and is shaped by, the attitudes and practices of everyday life, including those experienced in its 'native' institutions such as family, household, culture, tradition and so on.

[1] Habermas established the TCA in nearly 1000 pages.

Communicative rationality occurs in the lifeworld and it gives rise to communicative action. In communicative rationality, participants' lifeworld experiences inform discussion and debate over the validity of an idea, as explored by three types of validity claims: truth (Wahrheit), rightness (Richtigkeit) and authenticity (Wahrhaftigkeit). Truth relates to an idea's factual integrity; rightness relates to its consistency with established social norms; authenticity relates to the extent to which the participant's discussion represents the idea (Thomassen, 2010). An idea is calibrated according to discussion of its validity claims. A consensus is reached and merged with the lifeworld, which is reinvigorated. Thus, because communicative rationality transmits and renews cultural knowledge, the lifeworld is a self-replenishing, flexible and perpetual repository for shared meanings and communicative rationality is socially integrative because it enables shared meanings to be established.

The system complements and competes with the lifeworld and is characterised by economic and political functions (examples include election systems and information systems). Instrumental action occurs in the system. Lifeworld ideas that are of instrumental significance to the system are reified and made explicit (for example, in legislation and the economy) in the pursuit of system goals. If the instrumental action of the system is closely informed by the underlying norms of the lifeworld, it has social and political traction and relevance to everyday life. This results in a reduced need for policing and enforcement.

However, under the coercive influences of money and power, participants in instrumental action have vested interests which lead them to engage in competition and conflict. In achieving system goals (eg profitability or election), participants distort lifeworld ideas. A lifeworld idea which has been distorted by the system may still carry much of its lifeworld legitimacy and may be mistakenly interpreted as a lifeworld-embedded social norm. Thus, the lifeworld is susceptible to amendment by the system's imperialistic influences, for which Habermas adopts the term 'colonisation of the lifeworld'.

3.2 Privacy and the Theory of Communicative Action

The TCA owes much to the concept of private and public spheres. The private sphere is associated with individual authority, home and family; participants are unhampered by the system. The private sphere complements the public sphere in which people freely meet to discuss social problems and political action.

Others (Fuchs, 2011, Livingstone, 2005) have considered Habermas's work on the public sphere in their contributions to contemporary debate on information privacy. However, this paper's perspective differs because it supports the notion that in a particular context, according to social norms, one continues to have some privacy while in the public sphere (that is, psychological privacy), and therefore it diverges from the concept of private and public spheres (see also Fairweather, 2001).

As described in the contextual theory of information privacy (Nissenbaum, 2004, 2009), if an information flow disrupts the normatively-established integrity of a context, the availability of privacy is likely to change. In other words, according to established social norms, privacy norms and therefore privacy expectations differ from context to context. Furthermore, Westin (2003) indicates that privacy expectations emerge from a society's communication practices; when considered in the light of communicative rationality, this may support Nissenbaum's suggestion that privacy is normatively-established.

As Habermas's conception of the lifeworld articulates the significance of communicative action in the mutual shaping of social norms, it may be a fruitful position from which to think about information privacy: privacy expectations are the expression of social norms and they arise from communicative action in the lifeworld. The conceptualisation of privacy held by an individual person is informed by their experience of social norms in native lifeworld institutions such as family and culture.

It may be suggested that the diversity of privacy preferences existing in the lifeworld may not survive consensus-forming communicative rationality. As the TCA promotes genuine, uncoerced consensus, if communicative rationality that meets the criteria of the TCA erodes the diversity of privacy preferences existing in the lifeworld, it does so genuinely and without coercing participants. Under these conditions, it may be that erosion of diversity is justifiable. However, if communicative

rationality has elements that work to erode diversity of privacy preferences, there are other strong drivers of diversity working against these elements. At a fundamental level, people cannot all live in the same physical place, and the different places they live in result in different cultural experiences as they react to different environmental stimuli. In addition, their online activities may not be entirely homogenising (Fairweather and Rogerson, 2005).

Furthermore, although systemic privacy theories may be seen to colonise the lifeworld concept of privacy, they are based on, and integrate with, scholarly observations of privacy in the lifeworld. Therefore, to the extent that scholarly observations distort neither the lifeworld nor its observation, lifeworld-system reciprocity exists. This reciprocity has carried the diversity inherent to lifeworld privacy through to systemic privacy theory. This claim is supported by both the contextual theory of privacy (Nissenbaum, 2004, 2009) and Martin's social contract perspective (2012). However, under the TCA, as long as privacy continues to be the subject of theoretical and political debate, it is undergoing reification by the system. Therefore, observation and perhaps intervention are important in ensuring the diversity of privacy preferences observable in the lifeworld is accounted for in systemic privacy theories.

4. Analysis of privacy technologies

Under the motivation of regulatory frameworks, privacy is increasingly embedded in designs of technologies. However, many contemporary technologies are not designed according to conceptualisations of privacy that are consistent with privacy theory. Instead, privacy is often narrowly defined or conflated with other concepts. This section discusses two technological concepts that have been premised upon privacy misconceptions and considers their consistency with privacy theory with a view to applying the validity claims of communicative rationality in Section 5.

4.1 RFID identification scheme

In an example that is not unusual, privacy is narrowly defined by Vaudenay (2007) in: "… a formal model for RFID identification schemes" as "the ability to resist to adversaries aiming at identifying, tracing, or linking tags" [p1]. In this technological concept, public-key cryptography is applied in order to prevent the collection of data by any party not holding one of two keys. Under this model, data is either disclosed or not, therefore it is a dichotomous approach to privacy, conflating privacy with security and confidentiality.

If a technology implemented this concept, Radio Frequency ID (RFID) tags embedded in a product purchased by a consumer would interact with external tag readers, sending data to third parties. Information that may be sent includes product barcode, location, date, time and, if the consumer used a credit card and if the financial transaction is matched to the RFID tag at checkout, the purchaser's identity and credit card details. In order to be fully informed, a consumer would have to read the data from the RFID tag. This calls for awareness of the tag's existence, an RFID tag reader, awareness that an encryption key was needed, and the key. However, even with full knowledge, a consumer would not be able to prevent third parties equipped with these items from receiving data.

As this RFID identification scheme conflates privacy with security and confidentiality, it obscures the meaning of data privacy. In order contribute clarity, the RFID identification scheme is now considered with respect to each of the privacy theories identified above in Section 2.

The restricted access theory is inconsistent with the RFID identification scheme *per se*, however it is consistent to the extent that the data transmitted under this scheme is regulated, and this varies from nation to nation.

The control theory is inconsistent with the RFID identification scheme because the scheme does not provide an opportunity for informed consent and nor does it support the consumers' control of personal information in the proliferation of data.

Integrative theories are inconsistent with the RFID identification scheme because it supports neither the restricted access nor the control theories.

The property theory is inconsistent with the RFID identification scheme because consumers have no option whether to exchange the data in a financial transaction separate from the purchase of the goods in which the RFID tags are embedded.

The contextual theory is inconsistent with the RFID identification scheme because, other than the context of having purchased goods with RFID tags enabled, the consumer's context is irrelevant. Therefore, any social contexts informing the consumer's privacy expectations are also irrelevant.

The ontological theory is coincidentally[2] consistent with the RFID identification scheme because it increases the traction of the infosphere, however it does so in order to support confidentiality and security, not privacy.

In summary, the RFID identification scheme is inconsistent with all but the ontological theory of privacy, with which it is coincidentally consistent.

4.3 Privacy-preserving data mining

Privacy-Preserving Data Mining (PPDM) (Agrawal and Srikant, 2000) applies Secure-Multiparty Computation (SMC) or perturbation to data in order to establish a standard level of confidentiality. However, it does not establish a level of confidentiality customised to the context-relevant expectations of the people described by the information. As above, PPDM is now considered with respect to each of the privacy theories identified above in Section 2.

The restricted access theory is coincidentally[3] consistent with PPDM because it deploys data perturbation and Secure Multiparty Computation to prevent third parties from extracting meaningful information from data and from accessing data. In addition, PPDM is consistent with the restricted access theory to the extent that the personal data subject to PPDM is regulated. As with the analysis of the RFID scheme above, this varies from nation to nation.

The control theory is inconsistent with PPDM *per se* because PPDM itself does not provide an opportunity for informed consent. However, it is consistent to the extent that informed consent is sought and provided for PPDM.

Integrative theories are inconsistent with PPDM because, although it is coincidentally consistent with the restricted access theory, it is not consistent with the control theory (with the proviso of the possibility of informed consent being actually provided for).

The property theory is neutral with respect to PPDM. However, it suggests a problem. Under the property theory, PPDM is conducted over personal data that has already been the subject of a transaction. Therefore, at first PPDM appears to be innocuous with respect to the property theory of information privacy. However, PPDM can infer previously unknown information, X, about Alice for the benefit of Bob, the data holder. Assuming Alice already knows X about herself, PPDM reduces the opportunity for her to transact it in a privacy market.

The contextual theory is inconsistent with PPDM because PPDM makes no provision for consideration of whether established privacy norms are contravened. On the other hand, the breadth of the contextual theory's applicability means that PPDM technologies and practices may be extended to incorporate a privacy norms checkpoint. Therefore, the contextual theory is ultimately neutral with respect to PPDM.

The ontological theory is coincidentally[5] consistent with PPDM in the sense that PPDM assumes the constitutive relationship between Alice and the data that describes her. Also, PPDM decreases the

[2] There is no reference to the ontological theory in Vaudenay 2007.

[3] To the best of the authors' literature search abilities, at this point in time, there are no research papers discussing PPDM and these theories of information privacy.

traction of the infosphere and privacy by exposing information about Alice that she had not chosen to disclose.

In summary, PPDM is coincidentally consistent with the restricted access theory and it is inconsistent with the control and integrative theories. PPDM is neutral with respect to the property and contextual theories, however it is problematic under the property theory. Finally, PPDM appears to be coincidentally consistent with the ontological theory.

5. Technical cases and the TCA

The two technologies discussed above are either inconsistent with privacy theories, neutral or inadvertently consistent to varying extents. This section attempts an analysis of the cases above with reference to the TCA. The analysis aims to explore each technology's validity claims to truth, rightness and authenticity with respect to privacy theory. As noted above in Section three, truth relates to an idea's factual integrity; rightness relates to its consistency with established social norms; authenticity relates to the extent to which the participant's discussion represents the idea (Finlayson, 2005, Horster, 1992, Thomassen, 2010).

5.1 RFID identification scheme and the TCA

With respect to the validity claim to truth, as diversely articulated in privacy theory, the RFID identification scheme (Vaudenay, 2007) is inconsistent with all but the ontological theory of privacy, with which it is inadvertently consistent. Therefore, its validity claim to truth, with respect to privacy theory, is weakened.

With respect to rightness, the RFID identification scheme does not account for diverse, culturally-informed privacy norms. Instead it bypasses consumers, imposing a uniform approach to privacy. Thus, its validity claim to rightness is weakened.

With respect to authenticity, the RFID identification scheme conflates privacy with security and confidentiality, which obscures the meaning of privacy. This observation re-opens discussion of truth and rightness validity claims. If the RFID identification scheme aims to support security and confidentiality, then the validity claims to truth and rightness are re-opened to communicative rationality, not in terms of privacy, but in terms of security and confidentiality. Thus, the meaning of this technological concept with respect to privacy can be re-calibrated.

5.2 PPDM and the TCA

With respect to the validity claim to truth, as diversely articulated in privacy theory, PPDM is coincidentally consistent with, or neutral with respect to, the restricted access, property, contextual and ontological theories, and inconsistent with the control and integrative theories. That the consistency is coincidental is of no significance with respect to the truth validity claim, which focuses only on factual truth. Therefore, PPDM is consistent with four of the six privacy theories and makes a stronger validity claim to truth than the RFID identification scheme.

With respect to rightness, similarly to the RFID identification scheme, PPDM does not account for diverse, culturally-informed privacy norms. In applying a standardised approach to confidentiality, privacy norms are disregarded. Thus, PPDM's validity claim to rightness is weakened.

With respect to authenticity, similarly to the RFID identification scheme, PPDM conflates privacy and confidentiality, obscuring the meaning of privacy and the meaning of PPDM, which might more accurately be termed 'confidential data mining'. Thus, as above, discussion of the first two validity claims can be re-opened in terms of confidentiality, rather than privacy.

6. Conclusion

This paper applied the validity claims of Habermas's TCA in order to analyse the extent to which an RFID identification scheme and PPDM support privacy, as articulated in six privacy theories. The privacy theories and the TCA were reviewed to establish foundations for two analyses. The first analysis identified whether each technology was consistent with, neutral, or inconsistent with each privacy theory. The second analysis applied the TCA's validity claims. These analyses found that the RFID identification scheme and PPDM may have claims to validity with respect to data confidentiality or data security, but in terms of data privacy, the authenticity validity claims are weaker. This finding suggests there may be a requirement for entrenching approaches to privacy that more closely reflect privacy theory.

When designing technologies, for clarity of focus, perhaps privacy ought not to be conflated with related concepts such as security and confidentiality. Instead, it may be more robustly considered as a concept that overlaps with security and confidentiality. Misconceptions may lead to systems that entrench privacy approaches that fail to support information privacy norms, as expressed in privacy theory. In such cases, technologies will have weaker claims to validity, especially through the authenticity validity claim.

Authentically valid outcomes may be achievable if technologies entrench conceptualisations of privacy informed by the social norms arising in the lifeworld and as accounted for in privacy theory. In practical terms, optimal outcomes may be achievable when technologies support diverse privacy expectations that change from context to context. Systems designed to support these characteristics of privacy may be less likely to coerce users to adapt their privacy preferences to the technology, and less likely to motivate resistance actions such as circumventing the technology, falsifying personal data, or opting out. Such technologies may stand a chance of authentically representing the diverse privacy expectations informed by the social norms that arise in the lifeworld. These technologies may be more likely to support autonomy and freedom with respect to data privacy, while at the same time supporting the system goals achievable under such a framework (for example, accurate, representative data and customer loyalty).

Further research opportunities exist in applying similar analyses to other technologies. However, the next stage of this research project will attempt to apply a combination of the contextual framework and the ontological privacy theory to the design a Privacy-Enhancing Technology that will extend an emerging group of technologies, Brain-Computer Interfaces. Once the design is established, it will undergo a Habermasian discourse analysis in order to establish the strength of its claims to validity. The overall goal is the provision of valid privacy technology for users of Brain-Computer Interfaces.

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AUSTRALIA AND DATA RETENTION

Matthew J. Warren and Shona Leitch

Abstract
The information society has developed rapidly since the introduction of the World Wide Web at the end of the twentieth century. This development has of course meant that many countries (including Australia) are looking at a number of ways to protect their citizens from the increasing threats being presented by the information society. The Australian Federal Government proposed a number of ways this could be done through their discussion paper "*Equipping Australia Against Emerging And Evolving Threats"* including the introduction of data retention. The aim of this paper is to review the issues of data retention from the related public submissions and identify the issues and concerns that have arisen.

Keywords
Australia, Data Retention and Government.

1. Introduction

The information society has developed quickly since the introduction of the World Wide Web at the end of the twentieth century. The information society has resulted in a boom in electronic commerce, social interaction via social media but has also seen an increase in anti-social activities including cyber crime. Cyber crime is becoming an important issue for all countries, including Australia. One of the problems is the complexity of these crimes and the impact that this has upon law enforcement agencies and their ability to investigate and prosecute cyber crimes.

The Australian Federal Government report, *Equipping Australia Against Emerging And Evolving Threats* is a discussion paper that was considered by the Australian Federal Parliamentary Joint Committee on Intelligence and Security (Australian Government, 2012) in 2012. This report proposed that Australian Internet Service Providers (ISPs) should retain information for a two year period so that law enforcement agencies could gain access to the information if needed. The rationale for these changes is the ability to provide Australian law enforcement agencies the necessary information to investigate *high tech* crimes. The report itself (Australian Government, 2012) identifies *high tech* crimes as covering "identity crime, sales of illicit products, credit card fraud, money laundering and child exploitation material" in relation to criminal and terrorist activities. The reality however is that criminals and terrorists have become much more adept and innovative in their use of new technologies and Australian law enforcements agencies (from a forensics and law enforcement perspective) have a need to be able to investigate *high tech* crimes and activities; and as such they need to be able to assess online data that relates to suspected individuals. Currently ISPs only hold user data for short periods of time usually only days or weeks. This makes it challenging for law enforcement agencies to investigate *high tech* crimes effectively.

It is perhaps pertinent to consider whether Australia is unique in proposing national data retention strategies. The European Union (EU) (population 500 million) has had a *Data Retention Directive* (EU Directive 2006/24/EC) since 2006 and this has been implemented by all member states (apart from Germany and Belgium who have only partially implemented the directive (European Union, 2013)). This directive allows operators such as ISPs and telecommunication providers "to retain certain categories of data (for identifying users and details of phone calls made and emails sent, excluding the content of those communications) for a period between six months and two years and to make them available, on request, to law enforcement authorities for the purposes of investigating, detecting and prosecuting serious crime and terrorism" (European Union, 2006).

This paper will discuss why the Australian Federal Government is considering implementing data retention followed by an analysis of the public findings submitted to the Australian Federal

Parliamentary Joint Committee on Intelligence and Security. These themes and trends from this analysis will be discussed and in particular the issues raised by the submitters in regards to data retention in Australia.

2. Proposed Australian Government Strategies

The Australian Federal Government report *Equipping Australia Against Emerging And Evolving Threats* was a discussion paper that was under consideration by the Australian Federal Parliamentary Joint Committee on Intelligence and Security in 2012 (Australian Government, 2012). The report proposed a list of possible policies that could be implemented for the protection of Australia against new and potential security threats. It also discussed a wide range of security issues covering; new wiretapping abilities for law enforcement agencies, the protection of Australia's critical infrastructure especially the telecommunication sector (including the new National Broadband system) and amending and updating the powers of ASIO (Australian Security Intelligence Organisation).

One key component proposed was that as part of the *Telecommunications (Interception and Access) Act 1979*, the *Modernising the Industry Assistance Framework* should include "tailored data retention periods for up to 2 years for parts of a data set, with specific timeframes taking into account agency priorities, and privacy and cost impacts". It was recommended that the data retention policy would cover Internet and mobile based information (web, email, cloud and social networking) and the information could be accessible via Australia Law Enforcement agencies (Australian Government, 2012).

The Australian Federal Parliamentary Joint Committee on Intelligence and Security (a multi-party committee) requested public comment on the *Equipping Australia Against Emerging And Evolving Threats* discussion paper.

2.1. 2012 - Public Consultation

As part of the consultation process, the committee requested public submissions be received in the period of 1st July 2012 and the 20th August 2012. This was then followed by six (one was cancelled) public hearings between September and November of 2012 in Melbourne, Canberra and Sydney (House of Representatives, 2012). The breakdown of the submissions received is shown in Table 1.

Table 1: Breakdown of Public Submissions

		Not able to Assessed	Assessable submissions
Actual Submissions			193
Name Withheld (Anonymous submission)			3
TBA		2	
Confidential		30	
Supplementary Submissions			4
Answers to Questions on Notice			5
Total Submissions	237	32	205

Of the 237 submissions, 30 were deemed as being confidential and were not released to the public and 2 were described as TBA (to be announced) and no complete submission was actually made. This meant that there were 205 submissions that could be assessed; but 5 of these submissions were answers to questions on notice and were linked to the public hearings and specific questions, but for completeness these will still be assessed.

After the public submissions, on the 19th September 2012, the Committee received a letter from the Attorney-General clarifying the data retention aspects of the report (House of Representatives, 2012).

The Attorney-General made the following clarifications (Roxon, 2012a):

- The Government *does not* propose that the data retention scheme would apply to the *content* of communications. The content of the communications may include the text or substance of emails, SMS messages, phone call or photos and documents sent over the Internet;
- Reference was made to EU Directive 2006/24/EC and the data set that is collected in association with that directive, the implication (not actually stated) is that a similar data set would be used for the Australian data retention model.

At the end of July, a grass roots organisation called Get-up Australia (community advocacy organisation) developed an online campaign against the proposed changes under the banner "Protect us, But Respect Us". This included an online video campaign via YouTube (Get-Up Australia, 2013); as of March 2013 the Get-up Australian video had been viewed 59,593 times.

In September, 2012 The Attorney General released a video message to the Australian public about the potential National Security Reforms (including data retention) via YouTube (Roxon, 2012b). The aim was to clarify a number of misunderstandings that may have arisen through the public debate (especially to address comments made by the Get-up Australia YouTube Video), as of March 2013 the Attorney General video had been viewed 3,275 times.

2.2. The impact of the Hacking Group Anonymous

In July 2012 an event occurred where the hacking group *Anonymous* stole users data from the Australian ISP provider AAPT and disclosed the data on the internet to highlight this potential risk to both the government and the general public (The Australian, 2012a).The profile of the attack was that that Anonymous was able to steal 40GB worth of users data from ISP organisation AAPT and they released 180,000 sanitised records via Pastebin (see Figure 1). The organisations that were impacted in this information leak included (The Australian 2012b): the Department of Defence, the Australian Securities and Investments Commission, the Reserve Bank of Australia, ABC Ultimo, the NSW Attorney General's Department, the Labour Council of NSW and Queensland's Department of Premier and Cabinet.

AAPT's response to the situation was to publically confirm that the hacking incident occurred, that two files were stolen that contained limited data and that the data was historical in nature and had not been used for 12 months or more (Gizmodo, 2012).

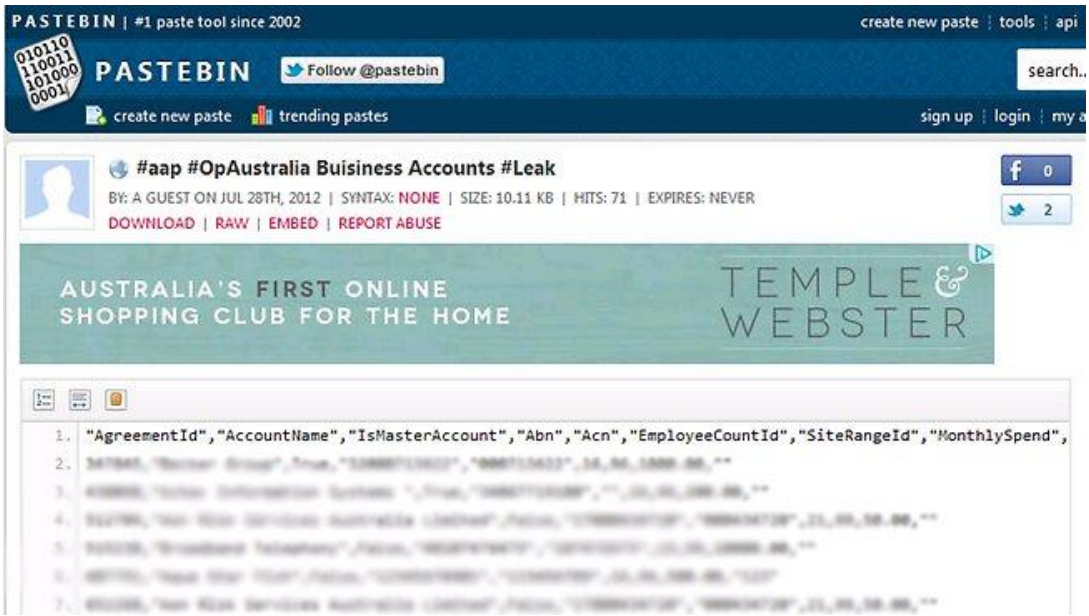

Figure 1: Release of AAPT Information via Pastebin

2.3. After the public consultation process

After the public submissions and hearings in November (2012) the joint parliamentary committee was still seeking further clarification on the data that would be held (even after the Attorney general clarification in September, 2012). The issue arose after representatives of the Attorney-General's department admitted that they had been having difficulty costing the scheme (with assistance from industry) owing to uncertainty about the scope of data required to be maintained. (The Australia, 2012c).

The findings of the Joint Committee on Intelligence and Security is still pending.

3. Research Model

This section of the paper reflects on the theoretical research approach that was chosen and the analysis of the sample.

3.1. Research Approach

A qualitative approach to analyse the sample submissions was used. Qualitative research is a complex, interconnected family of terms, concepts and assumptions (Denzin and Lincoln, 2005). It was decided to use the submissions as historical documents (Denzin and Lincoln, 1994) and these would form the base sample for the analysis to be undertaken.

The researchers carried out a content analysis of the submissions based on Prior's (2011) approach, that of:

- *Focusing on the document content* - looking at their content and carrying out the analysis of the whole document (in this case the submissions);
- *Focusing on the document as a topic* – looking at the documents and the impact in relation to schemes of social interaction and social organisation.

The aim was to determine the different schemes of social interaction and capture those as common themes in relation to the different samples.

3.2. Analysis

When looking at the submissions sample, five clear groups appeared; submissions by government (Federal and State) entities, individual submissions, corporate submissions, professional entity submissions and other submissions (individual politicians, political parties and religious groups).

The samples were then broken down into sub groups and a sample was analysed related to each of the particular sub groups, as shown by Table 2.

Table 2: Sample sub-groups

Sample Type	Sample Size
Government	10
Individual	10
Corporate	10
Professional Bodies	10
Other	5

The samples were analysed by one the researchers, initial themes were identified. These initial themes were then evaluated to remove duplications; the final themes are presented in Table 3. The themes are presented related to the sample and at the end the term POS, N or NEG is used to represent a positive, neutral or negative stance.

Table 3: Summary of Themes

Sample 1 Government • Accessibility of data for a set period POS • Improved law enforcement POS • Development of standard practices and approaches needed POS • Limitation of data collected NEG • Limited financial and privacy issues POS • Alternative approaches such as Data Preservation model need N	Sample 2 Individual • Increased fear NEG • Inhibits personal communications NEG • Impact on civil liberties & basic human rights NEG • Requirement of an oversight process N • Potential abuse of data NEG • Increased privacy issues NEG
Sample 3 Corporate • Increased security concerns NEG • Increased privacy issues NEG • Technology issues and risks NEG • Government financial support required N • Massive volumes of data generated NEG • Improved law enforcement POS • Increased operating costs NEG • High implementation costs NEG	Sample 4 Professional bodies • Requirement of an oversight process N • Increased security concerns NEG • Increased privacy issues NEG • Increased operating costs NEG • Potential abuse of data NEG • Massive volumes of data generated NEG • An extensive business case costing model required NEG • Formal definition of the dataset to be collected N
Sample 5 Other • Impact on society and citizens NEG • Massive volumes of data generated NEG • Increased operating costs NEG • High implementation costs NEG • Increased security concerns NEG • Increased privacy issues NEG	

What was of interest regarding the submissions with themes was the following analysis.

The positive themes that emerged related to:

- Improved law enforcement (Sample 1 Government and Sample 3 Corporate);
- Development of standard practices and approaches needed for the proposed data retention scheme (Sample 1 Government).

There were a large number of common concerns including:

- Security and privacy concerns (Sample 3 Corporate, Sample 4 Professional bodies and Sample 5 Other);
- High implementation costs of the Scheme (Sample 3 Corporate and Sample 5 Other);
- High operating costs (Sample 3 Corporate, Sample 4 Professional bodies and Sample 5 Other);
- Potential abuse of data (Sample 2 Individuals and Sample 4 Professional bodies);
- Massive volumes of data generated (Sample 3 Corporate, Sample 4 Professional bodies and Sample 5 Other).

The individual concerns (Sample 2) were negative about the proposal in general and the concerns related to the impact upon the individual and also wider society.

An interesting government theme (Sample 1) were concerns about the limited data types to be collected and the wish to actually preserve more data through a more extensive data preservation scheme.

4. Discussion

There are a number of potential issues and risks associated with the Australian proposal; the major risk being that ISPs would be able to retain personal user data and they would be unable to hold that user data securely for an extended period of time (highlighted by the APPT example). The various sample groups highlighted an extensive list of concerns (themed in a number of key areas); the Government sample appeared the most supportive.

Governance was a major theme and how to ensure that there is an effective oversight process implemented. The appointment of an independent commissioner could be needed to ensure that the data retention policies are correctly followed, that data is used by law enforcement agencies for the tasks identified and that data is not shared with other government agencies without authorisation. Cost for the ISPs will also be a challenge as they would have to improve their security in light of the proposals to accommodate the large amounts of user data that would require storage as well as developing new systems in order to track and sort data as per requests from Australian law enforcement agencies. ISPs would have to improve their security and develop new systems in order to track and sort the large amounts of data, as per requests from Australian law enforcement agencies; this of course would have financial repercussions. The cost of the implementation and running of the scheme was highlighted as being an issue, some of the submissions suggested that the government should pay for the full cost of implementation and running of the data retention scheme.

Even through the attorney general clarified that "The government *does not* propose that the data retention scheme would apply to the *content* of communications", this clarification did not occur until after the public submissions had been made, had it been made more timely this clarification would have helped to mitigate some of the concerns raised by the submissions.

5. Conclusion

The paper has reviewed the Australian Federal Government future security proposals and in particular related to data retention and analysed a sample of the submissions as well as identifying the main themes in relation to the proposals (positive, neutral or negative).

Future research will be to extend the sample analysis to include all of the samples and develop the themes into an overall model that represent positive, neural and negative attitudes towards the question of data retention within Australia.

Once the Australian study has been completed, a comparative analysis will be made of other data global data retention schemes.

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PRINTABLE GUNS IS AN IDEA WHOSE TIME HAS COME

Danny Weston and Catherine Flick

Abstract
This paper considers the dramatic example of the 'Wikiweapon' project aiming at producing a completely 3D printed gun by self described 3D printing collective, 'Distributed Defense' as illustrative of current and likely future controversial issues surrounding 3D printing technology. We argue that this case is representative of the multifarious difficulties the fledgling 3D printing technology raises for philosophers and likely prefigures future developments, especially with regard to how 'Distributed Defence' have responded to attempts to stymie their activity. This paper aims to consider some of the philosophical resources we have at our disposal at present for anticipating and assessing cases such as the above, which are sure to become more frequent as 3D printing technology becomes cheaper and more widely available. The paper presents both a review of the utility of some existing approaches and a general argument for articulating the issue(s) in terms of responsible innovation.

Keywords
3D printing, Actor Network Theory, Information Ethics, RRI

1. Outlining the problem

1.1 Introduction

3D printing, or additive manufacturing, is quickly becoming the next revolutionary technological innovation that will affect domestic life. It essentially works like a traditional inkjet printer, but lays down layers of a molten material, such as plastic, which hardens quickly, allowing more layers to be placed on top according to the design. Eventually, a 3D shape is produced. Until recently, the technology has been restricted to those, usually companies, who are interested in rapid prototyping, because of the poor quality of the prints and the expense of the machines and materials. Recently, however, low cost 3D printers, such as the open source RepRap, have come onto the market, opening up the ability for hobbyists and early adopters to enter the scene. Materials and accuracy of prints have rapidly improved. Sites like Thingiverse display pre-designed models, uploaded by members of the public, for everything from common tools to toy figures to replacement parts.
The title for this paper is the claim made by the 'Distributed Defence' self-described collective in reference to their "Wikiweapon" open source design for a 3D printer produced gun. Following the project launch, the manufacturers of the 3D printer that was to be used for the proof of concept, Stratasys, took action to cancel the lease of the printer and seize it to prevent it being used for such manufacture. 'Distributed Defence' had already courted controversy when trying to raise money through crowdsourcing finance site Indiegogo, who cancelled the fundraiser for the "Wikiweapon" project. They subsequently raised funds via Bitcoin, an anonymous internet "cash" equivalent currency.

This case is representative of the multifarious difficulties the fledgling 3D printing technology raises for philosophers and likely prefigures future developments, especially with regard to how 'Distributed Defence' have responded to attempts to stymie their activity. The question we aim to consider here is what philosophical resources we have at our disposal at present for anticipating and assessing cases such as the above, which are sure to become more frequent as 3D printing technology becomes cheaper and more widely available.

1.2 Zittrain's 'Generativity'

An unrealistic optimism often tends to herald a new development in ICT (though, of course, one of the major issues with 3D printing is that it blurs ICT technology with potentially ubiquitous and cheap manufacture of hard goods). Morozov calls it 'cyber-optimism' (Morozov, 2012), Lessig simply refers to it as 'cheerleading' (Lessig, 2010). In both cases it is argued that such views both purposefully and unconsciously would obscure certain facts – including obvious bugs – in the technologies they praised. Lessig says, "many of us simply turned a blind eye to this increasingly uncomfortable (and worse) fact: The Net was not in Kansas anymore" (foreword to Zittrain, 2009). Jonathan Zittrain himself (Zittrain, 2009) argues even more bluntly – that to understand the problems we face with digital technologies we have to face up to the fact that we are being overwhelmed by 'crud' and that we should put this 'crud' right at the centre of what they have become. We have new kinds of problems – and probably ones that won't have solutions without new kinds of concepts to underlay them. The other difficulty, of course, is knowing which point to set off from. The controversies surrounding 3D printing begin at the digital level, so starting there is as good a place as any, by following Zittrain's reasoning:

There is a fundamental openness to digital technologies we consider part of the digital, networking and internet landscape. It's an openness we don't find in many of our other devices – especially for example 'white goods' such as fridges, ovens and the like. In fact compared to almost all of the other technologies we use, this is actually completely anomalous. It is this 'openness' that Zittrain stipulates as the primary basis of his concept 'generativity'. The opposite of this he refers to as 'tethered' technology. Whilst there are many 'tethered' devices and technologies in the digital, networking and virtual landscapes, as a general rule these said technologies are more like to have a basis, or origin in 'generativity' that is only subsequently 'tethered'. He defines 'generativity' explicitly as "...a system's capacity to produce unanticipated change through unfiltered contributions from broad and varied audiences." Further specifying these 'varied audiences', he says, "contributions from diverse people and groups, who may or may not be working in concert, with the output of unanticipated change." And with regard to the inputs: "…how much the system facilitates audience contribution is a function of both technological design and social behaviour." (Zittrain, 2009) – the concept of 'generativity' is thus also describing relationships between technologies and between its users. The extent to which it is generative is also reflected by how far the users feel they are just consumers or contributors and participants.

This certainly provides a useful outline for approaching the digital aspects of 3D printing – specifying its fundamentally generative nature, anticipating how designs will be shared, modified and improved and so on. The 3D printer's generativity is not only derived from its networked capabilities but also from its very nature as a 'general solution looking for problems' as Zittrain characterised the PC and the generative revolution that rapidly followed its sudden ubiquity. Zittrain however, forsees a 'generative paradox'. The problem now is that:

"…the very popularity and use of the Internet and PC are sorely testing that generativity. We wouldn't want our cars, fridges, or TiVos to be altered by unknown outsiders at the touch of a button – and yet this remains the prevailing way that we load new software on our PCs. More and more often that software is rogue – harvesting computing cycles from a PC in order to attack others, stealing personal information, or simply frying the PC. Soon, either abruptly or in slow motion: splat." (Zittrain 2009).

The Apple iPhone is the classic 'tethered appliance' of today. Tinkering by hobbyists is not permitted. All new applications have to go through Apple's vetting process and can be delivered only via the Apple Store. Apple at one point threatened to turn iPhones into 'ibricks' if they were found to have been modified outside of Apple's control (the colloquial term for an iPhone that has been made accessible to third party tinkering is a 'jailbroken' phone). This device typifies the 'tethered appliance' in Zittrain's sense in that "It is….one of sterile appliances tethered to a network of control." Malware will certainly be aimed in future at 3D printers, however the outcomes are somewhat different, and any question that they may produce – even by accident – dangerous or even lethal material items, goes to the heart of the concern raised in this paper. As fear, uncertainty and doubt spread regarding generative technologies then many users will in fact welcome further lockdown of their devices. This

is a process that, Zittrain argues, will be spread along by the legislature and in turn will create further opportunities for regulation, surveillance and control by one or more centralised bodies.

For Zittrain, the internet until recently has been not just a generative device but a generative network - it "fosters innovation and disruption". Increasing lockdown of devices into 'tethered' appliances is however leading to what he calls an appliancized network. The latter stymies innovative capacity whilst also increasing regulability (and with it, visibility of participants actions). The latter may be seen as advantageous by some for managing the consequences of ubiquitous 3D printing yet it will inevitably fail against anyone willing to adapt and learn possibly risky techniques for stymying both surveillance and control at a distance. Just compare the 'jailbroken' iPhone (according to a relatively recent report, more than a third had been so modified in China alone (Lu, 2011)). Any movement towards 'enclosure' of 3D printing would likely rapidly backfire, especially once their cost drops markedly. The problems that 'Distributed Defence' encountered in their 'Wikiweapon' project were primarily facilitated by the fact that they rent their 3D printer from a third party. Even if such devices were only ever sold with 'hardware as service' end user agreements in place, the usage of the iPhone demonstrates the willingness of customers to risk not only complete loss of service, but even prosecution.

Similarly, pursuing a more 'tethered' approach where the device's functions are tightly controlled remotely encounters similar difficulties, especially as it is only a contingent characteristic of the printer that it is networked at all. Tethered devices such as Echostar or TiVo give the manufacturers the ability to disable devices from a distance. In an example discussed by Zittrain for example, in 2006 EchoStar was ordered by a Texas court to kill its DVR functionality in a legal battle with TiVo who claimed patent infringement. This leads to what is effectively a contraband situation, where offending articles of property can be impounded and destroyed. Only in this situation, there are no raids on homes or warehouses, no warrants issued for searches, only what is effectively property destruction enabled remotely – and to the outside world effectively invisibly (Zittrain, 2009). No devices have been destroyed as yet, however such remote remedies are not unknown (Amazon for example, and without irony, suddenly withdrew thousands of copies of George Orwell's 1984 from Kindle Readers due to a copyright issue).

What about physical generativity at source, though? A commonly used anti-piracy advert ("Piracy, it's a crime") launched by the Motion Picture Association in 2004, opens with the statement 'You wouldn't steal a car' and then lists a number of other undesirable activities with a view to relating them to digital piracy. This was rapidly converted into a competing meme online, attempting a reductio ad absurdum – becoming "you wouldn't download a car". With the advent of 3D printing technology however, one just might.

1.3 Actor Network Theory (ANT)

So far the most disruptive aspect of these technologies has been to tip the scales in favour of the individual, and as Benkler notes (Benkler, 2009), this has provoked a powerful reaction in the established interest groups most affected. Print media reacts to online media. Entertainment industries react to digital piracy. A ubiquitous 3D printing cottage industry could soon challenge a large swathe of the manufacturing industry.

How to anticipate the ethical dimensions of this is confused by the very nature of the technologies in question. Existing roadmaps such as those provided by philosophically inclined legal scholars (Benkler, 2009), (Lessig, 2006), (Zittrain, 2009) and (Solove, 2008) map primarily the digital domain. Category confusions have been rampant in this area alone, creating enough intractable difficulties for philosophers to busy themselves with. 3D printing however threatens to confuse not just categories but entire domains. It is truly a 'hybrid' in the Actor-Network Theory (ANT) sense. Referring to news articles, Latour describes how such hybrids: "sketch out imbroglios of science, politics, economy, law, religion, technology, fiction" (Latour, 1993) Moreover, they also mix 'humans' and 'non-humans' intimately – one of the key observations driving the theory and practice of ANT. For Latour and other ANT scholars, many of our present philosophical conundrums are driven by mistaken attempts to 'purify' such hybrid entities, practices, objects into definitive categories – and we are confused when

they dynamically mix. To that extent, ANT provides practical guidance for how to describe and possibly even predict the future of 3D printing technology. Its emphasis on 'hybrids' and presenting an ontologically flat description of both humans and 'non-humans' and the notion of 'work' required to maintain a network has comprehensively equipped already to provide useful insights into using digital technologies as (Venturini 2010) notes. It is similarly no great leap for it to be applied to the practice of 3D printing on an individual case by case basis and deployment of the technology more generally – a thorough methodology is supplied by Latour in 'Reassembling the Social' (Latour, 2005) and is supported by dozens of in depth empirical applications across the ANT literature that are of relevance to both the digital and 'hard' aspects of the 3D printing hybrid.

On ethical issues however, it is silent – indeed as Latour envisioned it from the very start to be a theory and practice free from normative judgements. Whilst Susan Baase's contention then (Baase, 2007), that in technology ethics it is best to adopt the best tool for the job rather than argue over which particular ethical theory is 'best' overall, (selecting the approach that most closely matches the issues raised by the specific technology), has been a useful imperative to approach other ICT issues, it is not so helpful for addressing the challenges of 3D printing.

1.4 Information Ethics (IE)

Floridi's 'Information Ethics' (IE) has been tremendously useful in tackling ICT ethical issues. The 'allocentric' focus on an object, or patient centred approach, putting information (rather than the human subject) at its heart has untangled many a thorny conceptual bush. Its major weakness however, is when extended beyond the virtual realm of information. Floridi makes a valiant attempt to extend the theory to physical entities, including humans, regarding them as ever more complex informational entities, or 'inforgs' (Floridi, 1999). This is tied together using a tenuous concept of 'dignity' – where the preservation of the more complex 'inforgs' such as humans, takes precedence over the most simple (e.g. a data disk). We would argue that this has been ably dispensed with by (Stahl, 2008) in disputing Floridi's attempt to provide a universal applicability for his IE and neither do we believe is Floridi's response (Floridi, 2008) sufficient to save the theory in this single respect. This difficulty in extending the concept of 'dignity' whilst less pronounced for unthinking physical objects – such as 3D printers and their products – relative to humans, is still a large enough leap from the digital and virtual to render it of limited use in this domain. Whilst it is likely that Floridian directives may in fact result in intuitively correct conclusions (such as – it is problematic that 3D printers can create guns because they can be used to kill human beings, which are high up the 'dignity' scale of inforg complexity, (or in IE terms it could 'maximise their entropy')), its process of reaching such conclusions is too easily attacked and so we would argue that it should be abandoned as an ethical theory (or even heuristic) useful in this context.

As with many modern decentralising technologies (such as the internet), it is going to be difficult to identify the answers to these questions. It could feasibly be that there are no answers to these questions – groups such as "Distributed Defence" are always going to find a way to avoid oversight, or find methods to continue with their project despite their potential ethical and social irresponsibility. But this is an extreme example – as shown by the open source movement out of which some of the enthusiasm for 3D printing has come, there are those who wish to be socially and ethically responsible but lack the resources to know how to identify and address the issues.

2. Responsible Research and Innovation (RRI)

Our remaining choice then, we argue, is to discuss these issues in terms of responsible innovation, a modern method for framing discussions about technology, society, and ethical values. How can we ensure that 3D printing is only used for 'good'? Who is ultimately responsible for the results and use of this technology – the 3D printing technology designers, the designer of the model, the printer of the model? What sorts of oversight mechanisms should be created?

One option is to apply an increasingly prevalent attempt at encouraging "responsible research and innovation" (RRI) – identifying and engendering responsibility in those who would develop and use

technologies. Over the last few years, this approach has become the focus of long term funding agencies such as the European Commission when looking at the sorts of technology development projects that request funds. The original aim was to involve stakeholders from the very early stages of development, with the aim to "co-develop" innovation so that "co-responsibility" between society and innovators could be ensured (Owen, Macnaghten & Stilgoe, 2012). Rene von Schomberg regarded this as an important step in allowing "a proper embedding of scientific and technological advances in our society" (2011). Although much of the discourse is aimed at funding bodies, such as the EC, there is a distinct responsibility planted firmly on those innovating and researching, and not just on regulation. In defining responsibility as a "collective, uncertain, unpredictable activity [we focus] attention on dimensions of responsibility such as care and responsiveness which are values- and not rules-based, allowing for discussion concerning purposes and accommodating uncertainty" (Owen, Macnaghten & Stilgoe, 2012). It is in this way that the discourse of RRI can allow for technologies that are disruptive, and which "break the mould" that may have been predicted for such technology, such as the internet and, more recently, 3D printing, but which places the responsibility for the use and further innovation of these technologies firmly on both society and those who develop them. Grunwald (2011) suggests that there are three possible mechanisms by which disruptive technologies with "normative uncertainty" could be dealt with: the techno-sceptic approach, in which the technology is rejected by society; the constructive approach, in which the properties of the innovation which are troubling to society are modified; or the techno-optimistic approach, where the normative framework within which the technology has appeared is changed, so that the technology is now accepted. Grunwald goes on to elaborate that each of these could be introduced at various levels at which decisions about technologies are made: political levels (regulation, public funding, etc.); entrepreneurial decision making levels (looking at the reception of the economy); engineering levels (through individual innovators and researchers, or through professional societies and ethical codes), consumer behaviour (preferences of users, purchasing power), and public debate levels (which can influence the others) (Grunwald, 2011).

With this in mind, who would be responsible for the development of 3D printing of "undesirable" objects? Certainly RRI theory as described above would point to the creator of the model and those who decided to make use of it. With the difficulty of regulation of models and printers, it would only make sense to take a techno-optimistic approach, and reframe the normative framework in which 3D printing is placed. However, it should be up to society (enabled through public debate) about which uses of the technology are deemed acceptable, and for this to filter through entrepreneurial, engineering, and consumer behaviour levels, with each of these stages theoretically and ideally reflecting on the decisions made about the technology. It would then be the responsibility of those involved to reflect on and justify their decisions openly and transparently, and accept the social and/or otherwise consequences of their actions.

However, practically speaking, this may not be easy– it would require, as Grunwald suggests, a "complex interplay of interventions at all of these different levels" (2011). If merged with an idea of prospective responsibility, however, such as that proposed by Malsch (2012), society could identify technologies that have normative uncertainty, and clearly define responsibilities within the research and innovation before too many decisions are made. In the 3D printing case, the possibility that guns could become printable should raise the question of who might be responsible for such an activity, and co-construct with society the responsibility trail for any potential use of the technology in that way. This does not go so far as to regulate the technology, but to at least identify the chain of responsibility for any such use of the technology, hopefully before such technologies are used in such a fashion, so that those involved could be educated of their responsibilities.

This is not to say that RRI theory is the only possible response to this issue – RRI discourse is still in early stages, and does not seem to be able to agree on many terms as yet (the main one being "responsibility"), but it opens up the area for discussion and gives some pointers as to how a framework in which disruptive technologies such as 3D printing could be handled in a democratic, co-constructed manner.

3. Conclusion

RRI provides a particularly promising avenue of research and philosophical inquiry for dealing with the issues raised by 3D printing. We hope that in this – too brief – survey of several approaches, we have illustrated that no single approach is sufficient to capture the intricacies and cross-category and domain transitions required to even outline the problems in the first place, never mind provide workable solutions for them. A broad-brush conceptualisation such as that offered by Zittrain in his 'Generative/Tethered' distinction is enormously useful for 'thinking around' and articulating 3D printing conceptual terrain. Methodological approaches such as ANT, particularly with its strong philosophical attack on simplistic divisions and hierarchies of subject/object (represented best in (Latour, 1999)) provide an excellent basis for actively mapping the area empirically and could be useful in tracing the chains of responsibility mentioned above in the discussion of SSI. IE, similarly, has a useful role to play in consideration of the digital aspects of 3D printing. The one thing that is clear overall though is that there is still a tremendous amount of work to be done.

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MATURITY, ETHICS AND THE IS PROFESSIONAL (DOES AGE MATTER WHEN IT COMES TO ETHICAL ISSUE AWARENESS?)

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Abstract
As technology has developed so awareness of related ethical concerns has become more important. We expect decision-makers and policy-makers to have a good level of awareness and to understand the importance of ethical issues. IS professionals are no exception, and those working within a senior role should have an understanding and awareness of the ethical concerns that may impact on stakeholders. The IDEGOV project revealed that more mature IS professionals had a significantly higher level of awareness and perceived understanding regarding the importance of ethical issues, than younger IS professionals in the study. Concerns about lack of ethical education combined with an ongoing 'youthitization' within western society, therefore indicates a possible area of concern for future ethical decision-making within Information Systems.

Keywords
Awareness, Decision-makers, Ethical issues, Information Systems, Maturity, Perception, Policy-makers, Professionals, Youthitization, Ageism.

1. Introduction

Why does increased maturity seem to lead to a greater awareness of ethical issues in information systems (IS) and why is it an important issue to consider? This paper discusses these two questions by drawing on evidence from a global study across a mixed demographic of IS professionals. The IDEGOV project (Identification and Governance of Emerging Ethical Issues in Information Systems) was a year-long study that focussed on how IS professionals' identify ethical issues, and what governance structures were in place to address those issues. The study revealed several important concerns and offered some insight into how they could be resolved. Through survey questionnaires and in-depth interviews with IS professionals and practitioners from across the globe, several issues were identified, including trust, social exclusion, privacy and surveillance, (un)freedom, the impact of technological growth on job losses, misuse of technology and the dangers posed by the disgruntled.

The project was also conducted with a view to understanding the possible ethical issues that are emerging as new technologies are being introduced into the field of IS. For example, how to rectify security concerns (Katzan 2010; Raamgovind 2010) when technologies like cloud computing is hosted in one country but have clients in another.

During the course of the IDEGOV study it was identified that around 70% of the sample were over 50yrs old. This provided an opportunity to initiate analysis beyond the initial project specification to consider age related differences in perception regarding both current and emerging technologies, and to discover if awareness of the issues and concerns raised was related to age.

This paper presents the findings of the additional analysis and considers the indicators, influences and impact of a greater level of ethical awareness amongst older IS professionals than that indicated by their younger colleagues.

2. What is important in computer ethics?

Since the Post Reformation period, people have largely been concerned with safety, security, privacy and the family/community relationships that formed their initial 'primary ties' (Fromm, 1942 p.20). However, since the dawning of the information age, concerns have been raised regarding technology

specific threats and dangers such as data protection in addition to those primary concerns. As Dana (2004) asserts, concerns of privacy protection are likely to escalate with further technological developments (p.122) This has been alongside a gradual acknowledgement that as ICTs have become more sophisticated, so our ability to control and secure our personal information, keep it safe and keep it private has become more and more challenging for all users as 'the capacity to process privacy-relevant data is much increased' (Fairweather, 2001 p.314), as well as concerns about the accuracy of that data (Camp and Osorio, 2003). This has become a concern for users of ICTs from business to governments, and from individuals to communities (Garigue, 2007, Cullen, 2009). The debate however, continues to rage about defining what these primary concepts are, (a universal definition of privacy has still not been accepted) and how far their scope should be extended and applied to IS. However, as Korzaan and Boswell (2008) suggest, it is clear that people still place a value on the key areas of safety, security and privacy, even if they have their own perceptions of what they are and how much they expect to be protected (McArthur, 2001).

Information systems have changed the world, and in doing so, created new concerns that need to be addressed by decision-makers and policy-makers alike. It is therefore the responsibility of those working within the field of IS to be at the forefront of acknowledging and addressing those concerns. Information systems professionals across a wide range of disciplines should therefore, by the nature of the jobs that they do, be more aware of current and emerging ethical concerns than those who merely use the technology (Xu, et al, 2011; Kauffman et al; 2011).

Findings from the IDEGOV project, revealed a list of ethical concerns raised by IS professionals from across the globe that showed an awareness and understanding of the dangers and issues, both current and emerging that was significantly more knowledgeable, concerned and pro-active than would be expected from lay end users who tend to display 'a lack of awareness of basic information security principles'. (Stanton et al 2005 p. 127) However, it was not until age was factored into the analysis that it became apparent that there were significant differences between the age groups regarding awareness and concern about the issues, and that there appeared to be a higher level of awareness and concern amongst older IS professionals. Whilst not entirely absent, when the analysis of the perceptions of the younger IS professionals was conducted, it appeared that ethical awareness and concern was either at a lower level than their more senior counterparts or (perhaps more worryingly) the issues were understood, but not perceived as being as important to address as other issues such as on-time-delivery, completing tasks, maintaining budgets, innovation for its own sake or just keeping a client or employer happy. As one older IS professional stated "There are a lot of responsibilities; I think that, there is a responsibility to take into account, all of the relevant stakeholders, not just the people who are paying you".

3. Demographics, Perceptions of age and IS professionals.

Literature on older employee's relationships with technology largely appear to focus on problems of training and engagement and where it is perceived that 'older workers are more likely to possess skills of an earlier work era and are less likely to participate in training' (Culley & VandenHeuvel, 2000). Other research has sought to 'compensate for age-related deficits like cognitive, perceptual, and motor declines' (Convertino et al 2005 p1). Each of these approaches draws attention to, and perhaps over emphasizes the negative aspects of older employees, and may be in some ways symptomatic of the trends in employment prospects and perceptions of the value of older workers by managers.

Although scholars like Abbey and Hyde (2009) and Olson et el (2010) acknowledge that there have been stereotypes of older people less likely to use new technologies, perhaps due to being cautious or resistant to the technologies, the findings from their empirical work have debunked these myths. They show that there is a rise in older people's use of technology and that this use is becoming similar to that of their younger counterparts. Adding to this, the IDEGOV study revealed that when it came to ethical awareness and concerns about dangers such as privacy and security, at least amongst IS professionals, the older generation were more cautious and savvy about such dangers and frequently cited them as possible reasons for lack of take-up of some new technologies, and their caution or even reluctance to use social media applications such as Facebook. That these people were cautious in their

approach to technology therefore, should be viewed as a healthy awareness of the potential risks and dangers, which is in keeping with the heightened levels of concern and awareness expected from a member of the IS profession, rather than any age related reluctance to engage through technophobia or a lack of ability to learn new skills (Lin et al 2011, Culley & VandenHeuvel 2000).

It has long been established that 'Older workers hold unique resources from previous work and life experiences—a wealth of knowledge and domain expertise, highly refined social skills, and problem solving insights into anomalous work situations' (Convertino et al 2005 p2). Therefore, a higher level of awareness of the issues could also be expected in a sample of older IS professionals. There were higher levels of authority and decision making responsibilities within the sample group that tended to fall upon older workers, and which goes some way to explain the initial skew in the demographics in the data collected for IDEGOV given the criteria for selection of participants outlined below.

There is however some area of concern regarding age when it is related to awareness of ethical issues and how that is used to inform decision-making. Despite the demographics of the study sample group, there is still cause for concern where younger people, (who have been shown by this study to have less awareness, and place less importance on ethical issues), are put into a position to make decisions and then do not consider those issues to be of importance.

Younger people may be brought into senior positions within organisations with a view that they can bring a dynamic, forward thinking and innovative way of working which will promote rapid growth and expansion, are not afraid to seek change rather than maintain the status-quo, and often champion the use of new technologies. Fenstermacher & Kleiner (1999) have pointed to the emergence of a "new paradigm shift - identifying the unique, creative contribution of each individual as a valuable asset, without regard to age or seniority" (p.13) in the work place.

However, there are concerns when people are promoted to senior management positions when their personal ethical awareness and judgement could have a significant impact on the success or failure of a business or project. Further, where financial considerations are paramount, ethical issues can be forgotten or discounted if their importance is not realised due to lack of awareness, and where 'legitimacy becomes subordinate to efficiency because notions and terms of legitimacy are discursively produced and defined by economic efficiency criteria' (Banerjee 2008 p.57-8). The question is, does having older decision-makers protect society from some of the greater excesses of corporate and government intrusion? If so, then the youthitization of senior management roles should be greeted with considerable caution.

4. IDEGOV Project

The empirical data collection for the IDEGOV project comprised two approaches, which were questionnaire surveys, the findings of which then informed questions used during in-depth interviews. Invitations were sent to a wide range of organisations with a view that they should fall into a set of categories:

- Any organization with a dedicated information systems unit
- An organization specializing in information systems
- An information systems consulting firm which sells/outsources its services
- A Non-profit organization which may be a member of IMIS

(IdeGov Final report 2012 p. 10)

Participants in the project were wide ranging, from philanthropic charities to banks and from education to military organisations and included people from a range of professions including managers, systems experts and technical staff. The age bias in the sample was felt to be due in part to the seniority of many of the participants alongside the age of some of those who were utilising their contacts to assist in identifying possible interviewees for the project.

Using Nvivo, software to assist with the coding and analysis of the interview data, revealed a significant number of concerns including:

- Security on data processing
- Abuse and misuse of technologies
- Lack of proper policy and policy of execution and implementation of emerging technologies
- Intrusion especially on wearable technologies
- Copyright software and intellectual property
- Surveillance resulting in censorship

The extent of the differences in awareness and concern between older and younger IS professionals was not revealed until age was factored into the analysis specifically. It was then discovered that older interviewees had a significantly higher level of awareness and understanding of ethical concerns than the younger IS professionals who participated. Concerns about the ethics of younger IS professionals was cited by the older interviewee's as being a concern for the future with, education or raising awareness being seen as very important. As one respondent said "Make them more aware of the values and so on, that are underlying the systems they are developing."

The higher levels of awareness and concern were not isolated to new and emerging technologies like cloud computing whereby awareness and concerns were fairly specific "it is envisioned that cloud computing would be a major technology in this field and also cloud computing comes with its concerns about privacy of course", but also included concerns about current technologies such as social media, the use of databases and the collection of personal data "people had been in control of what kind of data was collected and interacted with other parties, but not these days" The caution did not appear to relate to concerns about their ability to understand or utilise the technologies, but were more to do with awareness of possible concerns and real dangers that the use of new technologies such as social media and cloud computing could bring to an individual or an organisation.

This older group was also found to be more likely to consider ethical issues when using or developing technology, and in some cases would not use technologies such as social media due to those concerns. This contrasted with younger IS professionals who were more likely to be unaware of the issues and stated as such directly "I am not aware of these things." Or they would place much of the onus on the end user to take responsibility to identify concerns or to use equipment ethically "I don't believe there are any; it depends on how you use them."

It seemed that younger IS professionals were keen to use the technologies for networking and to assist career progression, or to communicate with family and friends. It also appeared that to some extent technologies such as social media were used because they were following the trend and considered it the 'in thing' to do in order to maintain visibility and involvement. This was apparent even amongst those younger IS professionals who did indicate a concern during the interviews "I am absolutely concerned that Facebook is selling my data to third parties, but so far the benefits have outweighed this fear of mine" and yet they still maintained a Facebook profile and did not always practice caution in what they posted online.

5. Analysis and Discussion

The differences in awareness between the under 50's and over 50's may reflect broad and diverse experiences and influences, and the sample analyzed can only reflect the views and perceptions of this particular group. However, as representative of the current position of IS professionals in a global context, the study raised some interesting issues.

5.1 Negative stereotypes of older workers

Importantly, the findings support the view that many negative stereotype views of older workers are not backed-up by the evidence of empirical research (Chou 2012, Stamov-Roßnagel & Hertel 2010, Abbey & Hyde 2009, Convertino et al 2005, Taylor & Walker 1994, Stoufer 1992). Such views can lead to older people being perceived in a negative light, particularly in the workplace where 'these stereotypes are usually based on subjective theories rather than empirical findings' (Stamov-Roßnagel

& Hertel 2010 p. 894-895). The IDEGOV study therefore provided some additional evidence that older workers may be more beneficial to organisations than some assumptions might suggest. Further, indications are that a more experienced and therefore more ethical and aware employee may actually improve productivity and efficiency long-term whilst also protecting an organization from making some mistakes that could prove costly both in financial but also in reputational terms. If therefore, we infer from the findings, that it is maturity and experience rather than just functional expertise that is an indicator for greater levels of ethical awareness, then recruiting older employees at all levels of an organization could be considered to be good management practice.

5.2 Youth culture and education

The subtitle of this paper refers to an approach that assumes that age is in some way a concern or an issue to address. However, there needs to be a discussion and more research done to discover whether or not the age of decision-makers matters within organizations when addressing ethics, and what the impact of the approach has on the development and success of IS. Current population trends within the UK and elsewhere continue to indicate an ageing population (McNair et al 2007) and it is expected therefore that there will be a much larger pool of older, more experienced people in the workforce over the next 20 years or so. As the current generation of highly skilled, tech savvy thirty something's start to pass 40 and then 50, previous stereotypes of the 'inflexible older worker who is afraid of technology' may well change.

It is understood however, that in order to become ethically aware it is important that IS professionals 'are challenged to expand their awareness of who it is they are responsible towards and the impact that has on their own rights' (Stoodley et al 2009 p.390). This can be achieved in-part by education and also through experience. One concern about a youth biased culture, is that there is little time for the development of awareness through experience, which acts as a brake on rash or short-sighted ventures, and yet the education of future IS professionals does not appear to currently address this gap.

There was also some concern from the respondents who considered that the current education of professionals might still be focusing too much on technological skills and business needs and culture as 'the IT discipline to date has been predominantly experienced as technology centred.' (Stoodley et al 2010 p.4) rather than including sufficient ethics, risk analysis and stakeholder engagement needs into the design, development, production, implementation and support to users. This concern was expressed by several older interviewees and it was also mentioned by some younger IS professionals, particularly where they were directly involved in research and development projects.

5.3 But does it matter?

Within the field of computer ethics, there is an on-going discussion about the core issues of concern i.e. privacy, security and safety alongside the protection of certain freedoms. Many of our concerns about the impact of ICTs and technology can be addressed by taking into account those concerns and addressing them (Stahl 2011, Stoodley et al 2009, Gandy 1993). If these issues are not considered adequately, then there is a danger of eventual usage creep towards unethical practices. These ethical issues and the way they are approached impact on future successes or failures, not only of businesses, governments and other organisations, but also the possible impact on the way that society develops in the future. Whilst it should be considered that concerns about safety and security can sometimes trump freedom and privacy, as evidenced by the development of the surveillance society, it is also necessary to ensure that the technologies and their uses are controlled and that 'accountability should start with the reminder that personal data, however abstract, has effects that are felt by persons' (Lyon 2001 p. 180).

Since Lyon's concerns were expressed in his 2001 publication, technology has continued to develop and there has been a further erosion of our ability to withhold and control our personal information. It is with this view that 'the emergence of a wide variety of new technologies should give us a sense of urgency in thinking about the ethical (including social) implications of new technologies' (Moor 2006 p.111). The popularity of social media, which is dominated by younger people means that the

importance of previously established norms, rights and expectations regarding issues such as freedom of speech, privacy and data-protection are being re-evaluated. Facebook privacy policies and the introduction of Google Street view with its subsequent privacy breaches highlight the need to remain vigilant in recognising and challenging unethical or questionable practices or development projects, and yet these questionable ethical practices do not seem to deter their users.

The re-evaluation of our ethical expectations means that concerns about many aspects of privacy or personal data protection could become impossible to maintain in any meaningful fashion. The landscape of ethics could be forever changed to accommodate powerful business interests and a social landscape that has significantly changed values. If so, then the ethical issues of today may well be considered less important by this and future generations of IS professionals. It may well be that current moral expectations are no more permanent than covering the legs of tables in the 19th century.

It can be argued however, that the potential costs of dismissing ethics are too great and that ethical issues remain too important and fundamental, and a failure to at least attempt to address them would be very worrying. Therefore, even if sometimes it seems that the use of ever more sophisticated technology is continuously promoted for greater financial return, and the protection policies retrospectively put in place will never be able to catch up with development, it will always be necessary to continuously raise awareness and try to address the issues.

The concerns discussed above indicate an ongoing need to be vigilant in identifying and addressing ethical issues in technology. It is perhaps the complexity and long-term impact that is felt so keenly by those who have lived through the development of technology and experienced some of its failures as well as excesses. By drawing on those previous experiences it may be possible to mitigate a short-term culture and avoid the situation where 'little learning occurs from mistakes and the same mistakes are repeated across institutions' (Leidner and Kayworth 2006 p.356). This further supports the need for both experience and ethical education for IS professionals. Knowledge and education about the history of technological development, its uses and impact provide insight into future outcomes. It is this lack of perspective and contextual knowledge that is of particular concern in respect of the younger IS professional who, according to the IDEGOV findings have relatively low awareness and concern about ethical issues than their older colleagues. This raises questions about whether some highly skilled young IS professionals are ready to be promoted to senior positions in light of their possible lack of personal ethical development.

Further, if it is experience rather than just 'talent' that leads to good decision making, ethical awareness and understanding, then it is important to ensure that IS professionals are exposed to high standards and expectations of ethical behaviour from senior colleagues as well as by ensuring that ethics are embedded within technical education. In this way it is hoped that it would in part mitigate the lack of experience in the event of being in a decision-making position at a younger age.

6. Conclusion

This paper has gone beyond the initial IDEGOV study and has considered age as a factor in the level of awareness of ethical issues and how the greater level of awareness and concern is related to the maturity of current IS professionals. Currently, decision makers and policy makers still tend to be overwhelmingly more mature individuals, and it is this group who appear to have a greater awareness, understanding and concern about ethical issues than the younger IS professionals interviewed. The extent of knowledge and reasons for concern expressed by the older professional indicated a current and up-to-date awareness combined with concerns drawn from experience. This finding has served to further address stereotypes and age bias in the current perception of older employees. Caution was expressed regarding youth culture and that any youthitization of the workforce in favour of a more dynamic and fast-paced approach should be mitigated with a balance of more mature employees to avoid rash decision-making and short-termism that could undermine progress and development in the medium to longer-term. The lack of ethical awareness of younger IS professionals and the concerns about the impact of a failure to address ethical issues can however be partially addressed by improving the education of IS professional and through implementing a change in the way that technical education is conducted to include embedded ethics at its core.

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AN ANALYSIS OF HIGHER EDUCATION USING FLORIDI'S INFORMATION ETHICS

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Abstract

We use Floridi's Information Ethics as a basis for analyzing the place of higher education in an increasingly interconnected and informational society, the infosphere. We consider a issues ranging from the purpose of higher education to broad policy issues including access, accountability and intellectual property. Of course, we include analysis of the changing nature of students in conjunction with our deepening understanding of cognition and the changing nature of the infosphere. Ultimately we conclude that ethics is becoming an increasingly important part of the responsibility of higher education.

Keywords

Information Ethics, Luciano Floridi, Higher Education, Higher Education Policy, Student Learning Outcomes

1. Introduction

In the development of Information Ethics (IE), Luciano Floridi develops a rich set of concepts to establish an information-focused analysis of ethics in the infosphere (2013). Here, we adapt those concepts to analyze the role of the University in the infosphere. We use "the University" to refer to the social and cultural structure that stems from the amalgam of individual institutions of higher education.

Floridi's (2013) Resource Product Target (RPT) model unifies computer and information ethics. He observes that early attempts at IE viewed agents as taking informational resources from the infosphere and either producing informational products for inclusion in the infosphere or targeting an entity in the infosphere for change. This is the External RPT model, since the agent is outside of the infosphere. This model fails to account for the impact the interaction has on the agent and its relationships as part of the infosphere. In our analysis, traditional higher education is subject to this critique as there are striking parallels between the External RPT model and the traditional understanding of the University. Clearly, the classic lecture-hall university—embodied in Freire's (1997) "banking" model of education—in which the student is the receptacle for the information deposited in her via university faculty reflects this external approach. Another common characterization is the University as an "ivory tower" existing outside of or on the periphery of society and that university experience prepares students for life in the "real world".

Floridi argues that the External RPT model is a micro-ethics. By placing the agent and its uses of information *within* the infosphere (the Internal RPT model), he establishes a foundation for a macro-ethical theory. A key feature of this approach is that it recognizes that the agent cannot escape the impact of its actions and is in part created by the information it generates. The self-reifying nature of this system requires a high level of analytical ability and capacity to understand and pro-actively shape it. Moreover, the abstract nature of the very materials that constitute the infosphere, in which an increasingly large proportion of the global population operates, demands reconsideration of how we approach higher education.

In this paper we analyze implications of the University and its various agents--a single university, the collective faculty at a university, a program of study at a university, students or learners, and a single faculty member--integrated within the infosphere. As agents, what resources are essential? What products ought to be valued and produced by the University and its constituent parts in an age when

providing access to information is no longer the primary objective of its existence? What are other implications of being an integrated part of the infosphere?

In the next section we address fundamental questions about the purpose of the University in the infosphere in a context that includes pressure from government and capital in the higher education sector. In section 3 we address policies surrounding access, accountability, and intellectual property. In section 4 we focus on students, identifying some of the metacognitive demands requisite of the realities in the infosphere. In the conclusion we reflect upon next steps for those interested in reconsidering the ethical complexities involved in having students, departments, faculty, and institutions of higher education engaged in the creation, maintenance, and evolution of the globally accessible infosphere.

2. On the Purposes of the University

A university, on one hand, is an institution designed to establish the terms and order of forms of knowledge. It confers degrees based on the ability of participants to succeed at a delivery model that requires conformity to specific structures of interaction (seat-time and compliance with demonstrations of understanding articulated by faculty). However, a university is also viewed through its ability to engage as an active agent, particularly through its students. As active agents, students navigate the intellectual, cultural, and social milieu to prepare them to shape their lives and communities. Historically, during their undergraduate experience students were encouraged to discover the expansiveness of multiple world views, the benefits of engaging in multiple levels of social life, and an awareness of a variety of ethical systems and their applications.

Floridi's analysis of the infosphere links to new norms for consideration in undergraduate education in significant ways. The University and its agents are challenged to recreate themselves due to features of the evolving infosphere (2013, Chap. 1, emphasis in the original):

1. a substantial erosion of the *right to ignore,*
2. an exponential increase in *common knowledge,*
3. a steady increase in agents' *responsibilities.*

According to Floridi, the erosion of the "right to ignore" is that claims that one did not know are becoming increasingly hollow. Since the infosphere is frictionless, information is readily available and easily found. The University and its constituent parts are expected to be cognizant of, and even anticipate, changes in the social, cultural, and political landscape. Each university is expected to be information rich. The University, as a producer of and resource for information, has an especially high expectation to be cognizant of the infosphere and its position inside of it. In particular, the University cannot ignore that it is a target of the informational acts of other agents.

"Common knowledge" here is the notion that not only does everyone have certain information but everyone knows that everyone knows that everyone has that information. In the pre-digital-era, the University was primarily treated as an information resource—information from the University was *not* common knowledge. It was rather, a valued commodity. Students attended universities largely for the information they held, both in the minds of faculty and in the stacks in the libraries. A secondary use of information by the University was as product. Faculty scholarship resulted in new information leading to new knowledge. Various agents chose whether to circulate or limit access to new information. The value of information was reified by controlling its dissemination. This value is being erased as, increasingly, information is circulated to the masses by the masses. Students rehearsed information producing processes through activities surrounding courses, but this information was for classroom consumption. Some students experienced the process of scholarship under the mentorship of a faculty member, producing new information that occasionally impacted society.

As circles of influence increase, "agents' responsibilities" increase. The increase is compounded as those that influence us grow. Today the infosphere wields increasing influence on the nature of faculty, students, and institutions. The University is in the midst of a crisis politically and economically, particularly as it relates to information and knowledge production and the confusion of these two notions in the public sphere. As Neem et al. (2012) note, education finds itself in an

assembly line model of production. This is due to the nature of funding universities, the lack of shared understanding of the benefits of a classically "educated" population as a cornerstone of maintaining the common good, and the rise of both free and profit-making models of education. For-profit online universities are getting noticed. Some support a "disaggregated faculty model" in which courses are developed by mentors who support delivery, rather than faculty, and students engage material on their own. At the other end of the spectrum is the availability of theoretically "free" education through Massive Online Open Courses (MOOCs). The combined pressures of limited economic growth for the middle and working class (those most likely to benefit from pursuing a post-secondary education) and the increasing cost of delivering post-secondary education in traditional institutions, have raised concerns regarding the value of higher education while raising the specter of disembodied education.

Why should an agent react to information only available within a course/faculty interaction when additional information is now available through online resources? Moreover, why should an agent within the University create only for a limited audience when the wider world may benefit from access to the information? Whereas, the idea of "thinking globally and acting locally" provided an ethical framework that made sense when acting locally was really the only realistic sphere of influence for those in the late twentieth century, what limits should we place on information generation now that our work can be shared instantly on the Internet?

While the core purpose of the University has historically been seen as the production and interpretation of information, its role in the production and development of knowledge, "the web of mutual relations that allow one part of it to account for another" (Floridi 2010:51), has been less well understood. There has been rigorous questioning of the role of the University as an informational resource. Yet little is said about the creation of knowledge and questions have been raised about whether this is an economic problem, a political problem, a western issue or a global issue.

3. University Policies in the Infosphere

3.1 Access

A key question in higher education surrounds the type of access people with various backgrounds in various environments can achieve. Access includes the ability to enter a university through admission, but it also includes an ability to retrieve, know, and understand multiple materials without being discouraged by finding the encounter too difficult (Collini 2012). In the last 70 years the U.S. has experienced exponential growth in higher education enrollment. Access, in large part, has been driven by instrumental concerns including industrialization, unemployment avoidance, competition, civil rights, and the promotion of social mobility, and it has been funded by the state with an eye toward the enhancement of opportunities to achieve employment and middle class status (Callan 2011; Geiger 2011). Through an expanded infrastructure of two- and four-year campuses, and until recently the growth in the availability of financial aid, participation of all income groups in higher education rose from 47% in 1977 to 61% in 2008 (Callan 2011:85). Yet, gaps in educational opportunity still correspond to social class patterns of society, with those from families with incomes in the highest quartile having a greater likelihood of entering college (81%) than those from the lowest quartile (41%) (Callan 2011:85). Recent increases in tuition costs and reductions in financial aid are increasing the divide. New delivery techniques via information and communication technologies (ICTs) may open the door to mediation of these sorts of access issues. ICTs provide the cyberinfrastructure that creates the environment for a new knowledge economy (Willinsky et al. 2011) through which human capital may be enhanced (Williams 2012).

Floridi's (2012) reflection on the critical importance of *infraethics* as a vital tool for facilitating improved opportunities for positive *distributed morality* can be amply demonstrated in the individual and institutional actions we see in higher education today. ICTs have changed the very nature of what is possible, and probable, within institutions of higher education. Online education has crossed a tipping point making it economically viable in relation to face-to-face settings, and now MOOCs can–at least theoretically–provide some sorts of educational materials at a very different price point than previously possible. Students participating in MOOCs at accredited institutions that transcript these

courses can obtain high levels of information from field experts and accumulate credits that may be used or transferred to another institution in a shorter time frame at less expense. This raises at least two points for consideration. First, with MOOC availability it is increasingly difficult for individuals to claim a lack of access to various forms of higher learning. Access points of this type allow for a higher level of common knowledge and create a responsibility that strips claims that "I did not know" or "I could not know". Second, there is a requirement on a university for a heightened responsibility to consider carefully the transfer of credentials that include MOOC credits and to determine the quality of such credits and their placement in the curriculum.

While MOOCs provide access, they beg the question of access to what form of information. Do students experience a transmittal of information or a process of inquiry through a MOOC? Access implies that students receive a sense of the contingency and vulnerability of various forms of knowledge and an opportunity to practice critique in various ways (Collini 2012). A central question then is if access through distance models increases common knowledge and responsibility, how does the attainment of judgment progress? While the new paradigms of information delivery recognize the inherent declination of most students and scholars to learn better *in relationships* and provide new opportunities to connect and collaborate with people who are anywhere in the world, they have also created a cacophony of issues related to Floridi's notion of *distributed morality.*

3.2 Accountability

The University today constantly encounters calls for accountability. Since the publication of A Nation at Risk universities have been required to provide extensive information regarding their financial status, efficiency, and ability to effectively deliver curriculum for particular outcomes. In many ways the call for accountability has been perceived as a threat to university autonomy and self-regulation, bringing into question the very expertise of the educational enterprise and the creation of knowledge (Ewell 2011; Zumeta and Kinne 2011).

Collini (2012:107) notes that self-regulation is a standard that in the higher education environment and one that scholars subscribe to in their work of inquiry. Self-regulation and autonomy in one's work allow for deep analysis and ongoing contemplation that may seem peripheral to instrumentally driven environments. Yet they set the stage for extensive collective engagement. At this intersection we find a connection between current debates around accountability and Floridi's work on distributed morality and his comments on the "right to ignore" and "agent's responsibility".

One of the central struggles among governmental representatives, scholars, and higher education administrators has been a frequent eschewing, by universities, of assessment procedures that are designed to discern the strength of curriculum delivery, outcomes, and university effectiveness. While accountability measures are often posited upon a "rate of return" (Ewell 2011) that is instrumental in orientation, they also speak to the political landscape that universities have often sought to avoid or ignore. Yet the forms of self-regulation (e.g., expert reviews) described by Collini (2012) that are part of the inquiry process of scholars, provide the basic framework within which knowledge and responsibility may be developed. In essence many accountability measures have been set to "assure delivery" and place confidence in the rationality of consumers. However, what is missing from the accountability discussions is an awareness of the informational environment and a sense that accountability is multi-fold. Underpinned by the erosion of the right to ignore in the infosphere, the core of accountability is self-regulation, a development of judgment, an appreciation of rational argument, and an ability to effectively engage others in collective enterprises. Maintaining procedures for procedures sake within the infosphere, evidences a failure to understand the loss of the right to ignore or to engage in practices that are not responsible to the information and knowledge available.

3.3 Intellectual Property

Floridi (2013, Chap. 1) points out "that objects and processes are de-physicalised, in the sense that they tend to be seen as support-independent", and "that the right of usage is perceived to be at least as important as the right to ownership". These changes raise important intellectual property questions for

the University to address. Questions about ownership range the gamut: who owns online learning systems, online courses, information students create? Is this even the right question in light of the evolving importance of right of usage?

Other questions emerge in the infosphere. Why should an agent react to information only available within a course/faculty interaction when additional information is available online? Moreover, why should an agent of the University create only for a specific collective when others may benefit from accessing the information? A motivation for MOOCs is serving the broader good by providing education for those who could not otherwise access it. Yet inevitably the issue of competition for the attention and resources of those who might otherwise have paid for their education becomes conflated within this generosity.

Recent scholarship on the knowledge economy acknowledges that education creates human capital that provides access to a better life while simultaneously increasing an individual's responsibility. Yet knowledge is made competitive through intellectual property rights, raising additional issues of the value of the knowledge acquired. A shared commonwealth of knowledge that allows for global collaboration also requires an examination of codified knowledge and the historic manner in which it has been traded. As Williams (2012:31) notes, "Global protection of intellectual property rights is an expensive and highly specialized business, but unless it can be done successfully the economic value of the property falls considerably because of its intrinsic non-rivalry". The intrinsic "good" of the global collaboration may diminish the value of increased access to information and knowledge acquisition. Aware of these difficulties, scholars have sought ways to credit authors for their work and ensure authenticity and access. King (2007), for example, created a system in which citations include a universal numeric fingerprint to track data sources. It is through these patterns of attention, expanded awareness, and responsibility that distributed morality is evidenced.

4. Student Learning Outcomes for the University

An analysis of the University within the IE framework would not be complete without addressing learning outcomes or skills. Beyond basic and discipline-specific skills, students need to master informational abilities to be successful in their coursework and careers and to build knowledge. Students as information agents must develop skills to use, create, and become information. Additionally, students' development of metacognitive skills allows them to be self-referential agents, capable of deliberation and self-awareness as information agents. Overwhelmingly, modern students of the University are digital natives accustomed to the ubiquitous nature of ICTs. Digital natives have skills from growing up online; these students are "comfortable with new technologies and using them on a daily basis without distinguishing between online and off" (Palfrey and Gasser, 2008, p. 48). Despite this comfort, studies have shown that students still struggle with informational skills (Holman, 2010; Jones, et al, 2008; Purcell, et al, 2012; Zull, 2011). Research now begins with search engines, not at the library, with little understanding of complex search mechanisms, and with lack of discernment regarding relevant or reliable results; thus the problem is no longer access, but rather comprehension, evaluation, and use of information.

With the immediate availability of information, misinformation, and disinformation in the infosphere, it is essential that students have analytical skills, as well as metacognitive abilities to create, navigate, and utilize information. Specifically students need to understand when to scan quickly and when to focus deeply and to know how to control their environment to support the appropriate method of work. They need to recognize, comprehend, and apply general concepts to specific problems in different disciplines. They particularly need the ability to evaluate the quality of information.

Mastery of these skills is not specific only to success at the University. Head (2012:9) notes that employers expect new hires "1) know how and where to find information online, without much guidance; 2) use a search strategy that goes beyond Google and finding an answer on the first page of results; and 3) articulate a "best solution" and conclusion from all that was found".

In addition to specific skills and research strategies, students supposedly develop post formal cognitive skills (Sinnott 1998; 2003). Post formal cognition includes metacognition, which includes monitoring one's cognitive processes (Flavell, 1979) and metastrategy or recognizing the strategies

and processes one uses (Kuhn, 2000). The metacognitive development of students in information search process has been described by Bowler (2010) in a naturalistic, qualitative study that identified thirteen metacognitive skills that support high quality research. The thirteen metacognitive skills she describes are intimately connected to the practical steps in research. The metacognitive aspect of these skills is the student's self-awareness of employing them.

There are numerous metacognitive skills necessary for successfully and ethically navigating the infosphere. One metacognitive ability is metastrategy, which is directly connected to skills and deliberately differentiating the use of specific skills. For example, one must understand that sometimes one needs to focus deeply and narrowly while at other times one must scan widely and quickly. Metastrategy requires understanding that these two approaches exist, that they work best in different circumstances, and when and how one best applies them.

The second type surrounds having an understanding of the nature of information. Bowler's (2010) list includes the metacognitive skills of understanding memory, how memory works and the role it plays in retrieving and using information. Also important is understanding the difference between memorization of information and the application of information. Students' evaluation of the quality of information, availability or lack of availability of information, methodologies and epistemologies are all included here.

Another metacognitive skill students need is to understand the principles for determining effective and ethical treatment of information. As Sinnott (2003) explains, post formal cognitive development includes the recognition that ethical and factual positions should be tentatively held. Students with highly developed metacognitive skills recognize that ethical principles must apply to complex and changeable situations, and new information may result in a reevaluation of the quality of old information.

Finally, the metacognitive skill of self-monitoring allows students to maintain awareness that they are utilizing all of these metacognitive skills as well as basic research skills. As Flavell (1979) explained, metacognition at its most basic is an awareness of understanding, an awareness of a lack of understanding, an awareness of one's confidence, a deliberate use of specific strategies, and both accurate and inaccurate assessments of one's own cognitions.

These skills are not unique by any measure; most institutions incorporate similar learning outcomes and in fact, the skills listed above follow closely the long-established ACRL Information Literacy Competency Standards for Higher Education (ACRL 2000). However, there is a greater urgency in its application within the infosphere in relation to higher education. Floridi's Internal RPT model (2013, Chap. 2) reminds us that the student and the University are not separate from the infosphere, but part of it. All entities take, use, and produce within the infosphere and with this is the need for an information ethic. According to Floridi (2007:61), "the infosphere will have moved from being a way to refer to the space of information to being synonymous with Being". Students, each university, the University, and indeed, society are part of the infosphere. It is essential that skills are taught, as well as practiced in order to make the infosphere the place we want it to be.

5. Conclusion

In this paper we have begun the task of analyzing the University from an informational perspective using Floridi's IE as an analytical framework. The myriad entities that comprise the University make this a complex task. We have articulated an informational perspective on the purposes of the University. We have identified three major policy areas that are essential to the University in the infosphere. We have identified metacognitive skills that are informational in nature, and, thus, of particular importance to citizens of the infosphere. Rather than being the purveyors of information, higher education must refocus and emphasize in its classrooms and for its students the practices associated with developing strong analytical abilities with respect to obtaining, assessing, digesting, and synthesizing information.

The Four Ethical Principles of IE (Floridi 2013, Chap. 4) raise developing an informational approach to higher education to the level of an imperative. Floridi argues that we are in the midst of

constructing the information environment we are living in by changing the information around us. This is increasingly true for students as more of their lives take place in the informational environment and their actions have an increasing impact on that environment. The University today needs to address the creation of an ethic appropriate for the creation of the emerging informational environment where all informational agents have the opportunity to flourish.

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LEARNING COMPUTER ETHICS AND SOCIAL RESPONSIBILITY WITH TABLETOP ROLE-PLAYING GAMES

Katerina Zdravkova

Abstract
Tabletop online role-playing games enable active learning intended for different ages and capabilities. They have also been implemented in computer and engineering ethics courses. This paper presents the experience of implementing role-playing in several courses embedded in Web 2.0 environment, with an intention to confront complex and sometimes mutually conflicting concepts, and integrate them into a whole. Representative examples introducing two basic scenarios are presented together with the detailed analysis of performing the game. The paper concludes with student opinion and basic findings of the effects of role-playing in ethics learning.

Keywords
Active learning, Asynchronous learning, Web 2.0 learning environments

1. Introduction

According to Oxford Advanced Learner's Dictionary (Oxford, 2003), role-play is a "learning activity in which you behave in the way somebody else would behave in a particular situation". Almost forty years ago, it was implemented to facilitate the learning of English as a foreign language (Shapiro, 2012). Shapiro and Leopold deduce that the "new dimensions in role-playing pedagogy" improve the acquisition of vocabulary and grammar structures enabling students to innovatively analyse and synthesise content through creative and critical thinking.

An interesting survey dealing with mathematics education through chat and calls was done by Rosa and Lerman (Rosa, 2011). Their most important conclusion was that online learning brought "important new aspects to our understanding of mathematical knowledge as a social construction".

Several moving experiments with role-playing were performed with children with special needs. In 2001, middle school pupils with learning disabilities were trained to differentiate when to ask for help from their peers in five different role-play scenarios (Wolford, 2001).

Role-playing increased by repeated reading two stories, demonstrated that fourteen young children with hearing impairments learned to read and talk using a printed text, and their "narrative productions and story grammar usage". During the experiment, they managed to retell the story more sophisticatedly and with more complex phrases (Pakulski, 2003).

Role-playing also improved "listening, auditory comprehension and narrative/ conversation skills" of young boys with fragile X chromosomes (Mirret, 2003).

Multiplayer role-playing games for children as NUCLEO (Sancho, 2009) and video games like Morrowind (Kadakya, 2005) ascertained that virtual worlds could also be fruitful environments for active collaborative learning where overall student engagement escalated. Inspired by the regular use of Internet and online games, Taiwanese researchers developed a game-based learning system for a high-school course "World Geography" (Tarng, 2010). Authors concluded that the game enhanced students' learning unrelated with the gender and Internet usage.

Role-playing activities proved their usefulness for expanding learning and understanding of more mature students as well. Long-term experience of implementing games performed by oral presentations, directed towards identifying different functions of human body organs, has shown that the games motivated students "to engage in deep learning that results in a meaningful understanding of material and content" (Cherif, 2010).

Australian online role-play environment for higher education EnROLE integrated Mekong e-Sim Adelaide and Round Table Discussions. It included a framework for evaluating the approach, examined new methods from the learner and teacher perspective, and defined criteria for learning and teaching incorporating classroom activities, e-mail, custom web applications, standard LMS tools, Web 2.0, and virtual worlds (Russel, 2010). One of the former round table discussions simulated Ethics Committee meetings in pharmacological research intended to identify with ethical decision making.

1.1. Role-playing in computer ethics courses

If at the end of the 20th century, the fascination by "the pervasive use of information technology, ... the increasing number and complexity of the constraints on acceptable engineering solutions, ..., the globalization of industry, ..., and the increased pace of change" inevitably imposed that ethical education was "required to be an engineer" (Wulf, 1997), the beginning of this century demanded to "expose students to issues of professional practice, ethical behaviour, and computer law", including topics dealing with the "impact of computers on society, computing careers, legal and ethical responsibilities, and the computing profession" (CS, 2001). New trends suggest to confront students "to the larger societal context of computing to develop an understanding of the relevant social, ethical and professional issues" and to warn them that "new computer-based products and venues pose ever more challenging problems each year" (Strawman, 2012). Bearing in mind all these objectives, the crucial goals of computer ethics courses introduced in this paper are to identify various ethical concerns caused by the pervasiveness of contemporary information and communication technologies, and consequently to increase the awareness of instantaneous challenges they bring. In order to achieve this goal, teachers should not present self-experience and knowledge. It is rather inevitable to allow students to discover by themselves all the possible causes of these challenges, and all the countermeasures to prevent their reappearance.

There have been very few attempts to include traditional learning techniques into online environments exploiting tabletop role-playing games in teaching, and assessing computer and professional ethics.

Prince reports the positive effect of several role-playing games dealing with "number of key ethical issues" (Prince 2006). The approach he proposed was actually a speaking role based on previously assigned roles. In his sample of 37 students at the York University in Toronto, 23 were "foreign-born".

His method has been adopted "to assist the professional integration of foreign trained engineers", showing the potential to teach engineering ethics and professionalism in an extremely culturally diverse environment.

Although rather exhausting for students and particularly for teachers who have to supervise and direct the game, the attempt to implement group tabletop role-playing in computer ethics courses for undergraduates and graduates at University of Skopje and University of Novi Sad proved to be successful and well accepted by students (Zdravkova, 2009). The effectiveness of the approach was encouraging to experiment with two models of role-playing, which are presented in this paper.

Our experience shows that tabletop online role-playing games in computer ethics courses are very convenient leaning tools that enable confronting of several complex and mutually conflicting concepts into one integral whole.

In the following section of the paper two basic scenarios depending on student participation in the game are presented. Each scenario is illustrated by the game performed during academic 2012/13. Afterwards, the effort to participate in the game is presented. Particular attention is paid to student impressions about the approach. The paper concludes with the crucial findings of the approach.

2. Online tabletop role-playing games in learning environments

Miner and Hofmann (Miner, 2009) claim that blended learning is appropriate to "best achieve a training program's expected learning outcomes". They also suggest delivering of the content "as a role-play session supported by lecture in a traditional classroom".

Social networking and collaboration services unified in Web 2.0 and their incorporation into contemporary learning management systems enable evident online exchange of information and experience. They enhance learning and teaching, and significantly contribute to the creation of new forms of educational contents and study materials. Instead of being passive consumers of facts, students are stimulated to intensively exploit the world, and discover state-of-the-art facts. They present the results of their discoveries in "table-talk" form online, supporting Brown's and Adler's claim that "one of the best ways to learn something is, after all, to teach it to others" (Brown, 2008).

Contemporary learning environments with online interactive activities such as forums, blogs, and wikis support and facilitate tabletop role-playing. Writing can be replaced by table-talk using chat. All mentioned activities are incorporated in Moodle, the learning management environment, which has served as an e-Learning platform for computer ethics and social responsibilities courses at undergraduate, and postgraduate levels delivered at the University of Skopje and the University of Novi Sad since 2006 (Zdravkova, 2009).

In the winter semester of academic 2012/13, 90 students enrolled the undergraduate course in Skopje, and 74 of them have successfully finished it. The advanced postgraduate course in Novi Sad was attended by 41 students, and successfully finished by 33. Postgraduate course has recently started in Skopje with 11 students.

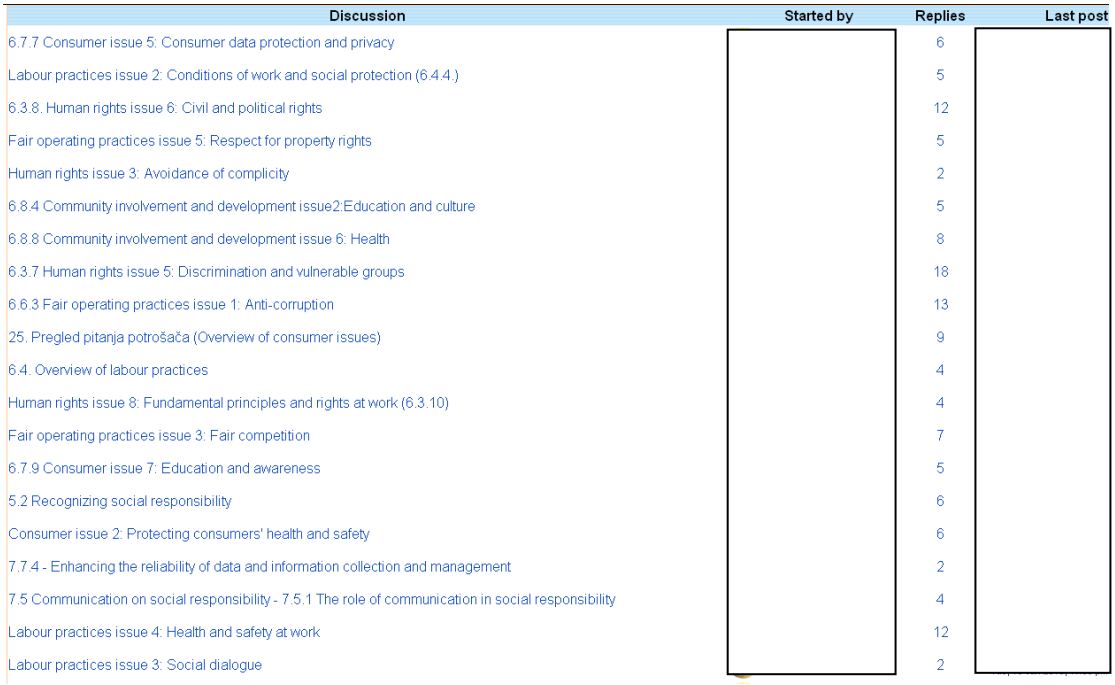
Three courses are delivered by the same teacher, and the same online activities, including group role-playing games are carried out for learning. The experience with these games has shown that they were among students' preferred activities. It was noticed that students put a lot of effort and discovered many new important things.

Therefore, role-playing based on real-life multidisciplinary problems remained a significant part of the assessment process this year. It enabled a confrontation of many opposing opinions and their integration in a whole.

The game has two basic scenarios: playing an individual game, and playing a game as part of a team. The game is predominantly accomplished through forums for exchanging the findings that support students' beliefs. Postgraduate students participate in two basic types of games: role-playing games with individual participation, and games within a group. Undergraduates play only group games with several members contributing to the common goal, to consistently defend the role they selected.

2.1. Role-playing games with individual participation

Whenever the course is attended by fewer students, role-playing with individual participation is used to stimulate research and critical thinking. It is much more convenient for postgraduates, who have already attended courses that cover the essentials of computer ethics during their previous studies, so they know how to recognise ethical dilemmas one issue brings, and at the same time know how to do research. The main task for all the postgraduates in both countries this academic year was ISO standard 26000 (ISO, 2010). After selecting the topic from an open list, students were supposed to prepare an individual essay with 1500 to 2000 words based on at least 10 different sources. Each essay presented the ISO topic student selected in brief, pointed up the most important findings in favour of the standard, and the examples of its violations. Particular attention in Novi Sad was paid to civil rights, discrimination and vulnerable groups, health and safety at work, and corruption and fair competition. Students in Skopje were predominantly concerned with social investment, protection of consumer's health and safety, fair competition and marketing, and human development in the workspace. Figure 1 presents the game which was simultaneously played in Novi Sad by more than 30 students.



Discussion	Started by	Replies	Last post
6.7.7 Consumer issue 5: Consumer data protection and privacy		6	
Labour practices issue 2: Conditions of work and social protection (6.4.4.)		5	
6.3.8. Human rights issue 6: Civil and political rights		12	
Fair operating practices issue 5: Respect for property rights		5	
Human rights issue 3: Avoidance of complicity		2	
6.8.4 Community involvement and development issue2:Education and culture		5	
6.8.8 Community involvement and development issue 6: Health		8	
6.3.7 Human rights issue 5: Discrimination and vulnerable groups		18	
6.6.3 Fair operating practices issue 1: Anti-corruption		13	
25. Pregled pitanja potrošača (Overview of consumer issues)		9	
6.4. Overview of labour practices		4	
Human rights issue 8: Fundamental principles and rights at work (6.3.10)		4	
Fair operating practices issue 3: Fair competition		7	
6.7.9 Consumer issue 7: Education and awareness		5	
5.2 Recognizing social responsibility		6	
Consumer issue 2: Protecting consumers' health and safety		6	
7.7.4 - Enhancing the reliability of data and information collection and management		2	
7.5 Communication on social responsibility - 7.5.1 The role of communication in social responsibility		4	
Labour practices issue 4: Health and safety at work		12	
Labour practices issue 3: Social dialogue		2	

Figure 1. Role-playing game with individual participation played in Novi Sad

Individual essays were prepared during a fortnight and uploaded in the topic related forum initiated by the student who selected the topic. They were graded immediately after being submitted with at most 70 of maximum 100 points. During the following week, students were discussing the same topics further, discovering interesting issues that were not elaborated by the original author. Their judgements and conclusions were also documented, formatted according to the essay template and graded.

Grades of individual essays and discussions were summed. Even after receiving the maximum of 100 grades, many students continued the debates. In several occasions, posts were confessions presenting personal experiences as victims of violation of social responsibility agreements in the communities they are part of.

2.2. Group role-playing

The broad problem is presented to students, and they select the role they consistently defend throughout the entire game. The selection process is open, so each student exactly knows which student has the same role, and who the game participants from the opposite teams are.

The game is played during a fortnight through two parallel forums, one for public discussion among all students, and the private forum for communication of the members from the same team. While the main forum is visible to all participants, the second is visible only to the team.

After the game in the central forum is completed, the supporting forum is used for the preparation of the joint report, which is briefly presented during the lectures. The report is a basis for the role-playing in the classroom.

Here is the task of the game performed this year:

Mr. Stingy, the owner of an IT company students work for, decides to fire the most unproductive employees, and those who use company resources for private purposes. He forms the project team MoniSoft engaged to create monitoring and surveillance systems against all employees, including themselves. MoniSoft members feel a moral obligation to inform others about their existence. As an answer, employees create their own counter-teams: Online spies who discover spyware techniques; Hackers who discover how to disable the creation of dangerous software; Identity protectors who explore privacy enhancing techniques; Solicitors who learn how to protect employees' rights; and Whistleblowers who prepare a report of dishonest activities in the company.

In order to disable spying and hacking of monitoring software, Mr. Stingy forms an additional team CriptoSoft with an obligation to explore all the ways to disable spying and hacking of MoniSoft's activities. National ICT Chamber of commerce is also informed and decides to resolve the problem, initially through mediation.

Since participants in the undergraduate course in Skopje knew themselves from previous courses, they jointly selected the role to defend. Each team consisted of 9 to 12 students. Postgraduates in Novi Sad were heterogeneous, thus they selected the role according to their interest in the role. Their groups had 4 to 5 members.

No matter the role and the number of participants, all the discussions were performed in one big forum, where student discussions were public and overt. Moodle couldn't offer anonymity of the participants, but since all participants have the role to be colleagues in a conscious company, anonymity was not essential for the game.

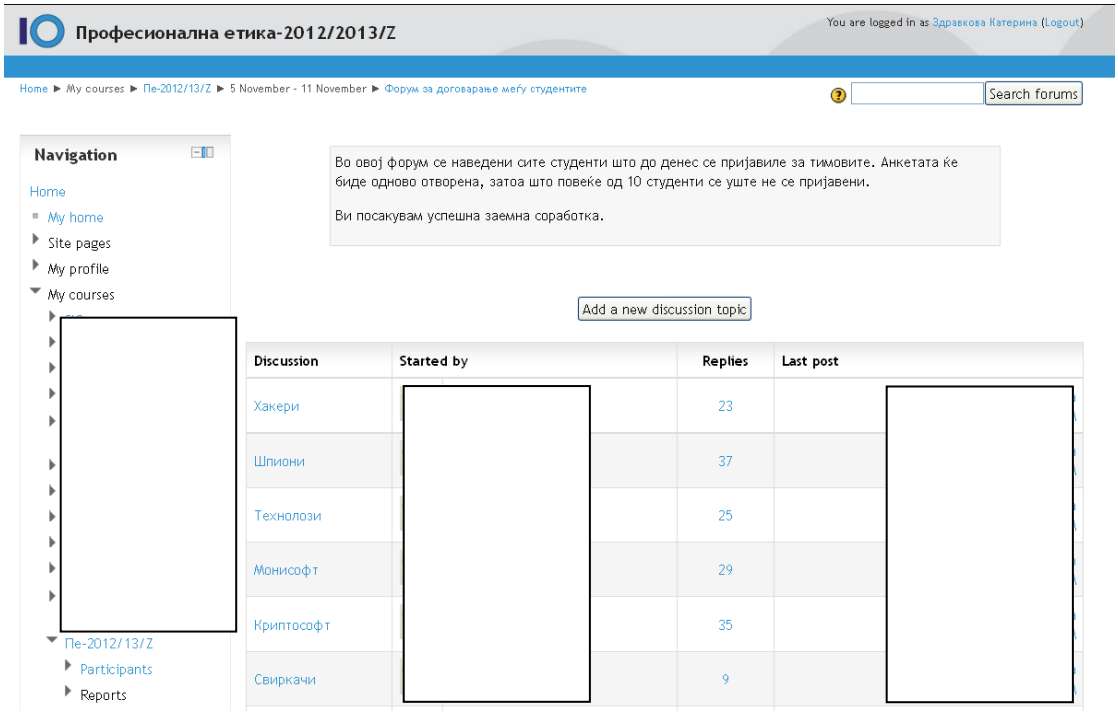


Figure 2. Mutual consultation during and after role-playing game with group participation

The teacher was always present online in both forums to direct the discussions, pose questions, contribute with facts students have neglected or ignored, and intervene if necessary.

Apart from online activities within the learning environment, student's group participation was supported by social media technologies outside it, particularly by social networks, instant messaging, chat, and mobile messages.

All posts were regularly graded. Grading stimulated students' enthusiasm to play their roles and consequently deepened their skills and increased self-awareness. While postgraduates were concentrated on technical details of the role they defended, which reflected their deeper understanding of the ethical concerns, undergraduates were enthusiastic to show the awareness of other's activities. In both cases, politeness was the main attribute of the discussions.

Joint reports were publicly presented in the classroom, usually revealing the hidden strategies of the teams. Each presentation was a small performance. After each presentation, the role-playing game continued, involving many students from other teams. Students were usually revealing the weakness of the rival team, which were not presented online. Crucially, most participants empathized themselves with the role they had to defend. They played it with great confidence and belief that the role their group played was the most crucial. Group playing enhanced by public discussions was a unique learning experience students enjoyed. It seems that it attracted them more than orthodox learning activities.

3. Effort to participate and to maintain the role-playing games

One of the crucial arguments against the implementation of role-playing in class is the impression that teacher's preparation period for role-playing is almost as twice as the period to prepare for instruction (Fanning, 2011).

Our impression is that the preparation period for online tabletop game-playing is not the greatest challenge for the teacher. However it is more exhaustive to be online ready to play and maintain the game.

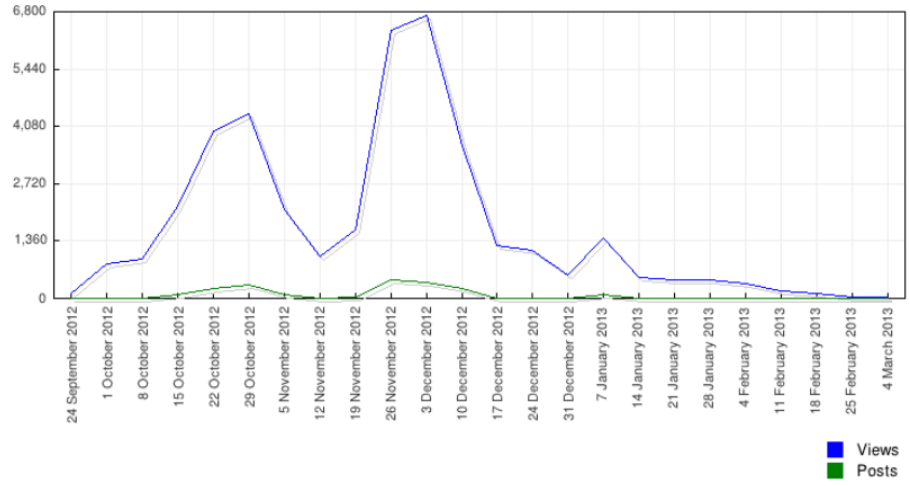


Figure 3. Views and posts during undergraduate course in Skopje

This academic year, postgraduates in Novi Sad prepared computer ethics logs, participated in two role-playing projects: individual on ISO 26000, and group on Mr Stingy's IT company, and prepared two individual essays.

Undergraduates in Skopje individually created wiki articles in the local Encyclopaedia of ethics, participated in the group game on Mr Stingy's IT company, and prepared two individual essays.

Accurate indicators of online engagement are the number of views and posts. Figure 3 presents them during undergraduate course. Expectedly, the highest pick corresponds to role-playing. Second pick was during Encyclopaedia creation.

Each participant in individual games initiated a personal forum and participates in the forums of other colleagues. Average contribution of postgraduate students in both countries was 6,38 posts, which produced in average of 3450,64 words each. Their posts were based on 54,09 references per student. Group projects were performed through two parallel forums, with an average of 7,81 posts in the main forum, and 4,60 in the supporting one. The detailed information is presented in Table 1.

Table 1. Activities during role-playing games in Skopje and in Novi Sad

Role-playing scenario	Individual participation		Group participation					
	Skopje	N. Sad	Main forum		Supporting forum		In total	
Number of students	11	33	74	33	74	33	74	33
Student accesses	1635	4839	9585	4346	5000	1380	14585	5726
Student posts	64	217	522	314	178	76	700	390
Accesses / student	148,64	146,64	129,53	131,70	67,57	41,82	197,09	173,52
Posts / student	5,82	6,58	7,05	9,52	2,41	2,30	9,46	11,82
Teacher accesses	131	233	108	148	81	60	189	208
Teacher changes	7	3	23	15	13	5	36	20

Although the teacher was not visibly involved in individual played games, the maintenance of the games was rather exhaustive. It comprised of the preparation of the environment for the game, direct

involvement in the discussions with own examples and findings, occasional correction of accidental student mistakes, precise reading of all posts, manual checking for plagiarism and grading. The effort was much intensive than in any other traditional course. Student feedback of this approach is presented in the following section.

4. Student feedback

Personal students' impressions about the amount of gained knowledge came from 22 postgraduates from Novi Sad (presented with dark bars in Figure 4.) and 60 undergraduates from Skopje.

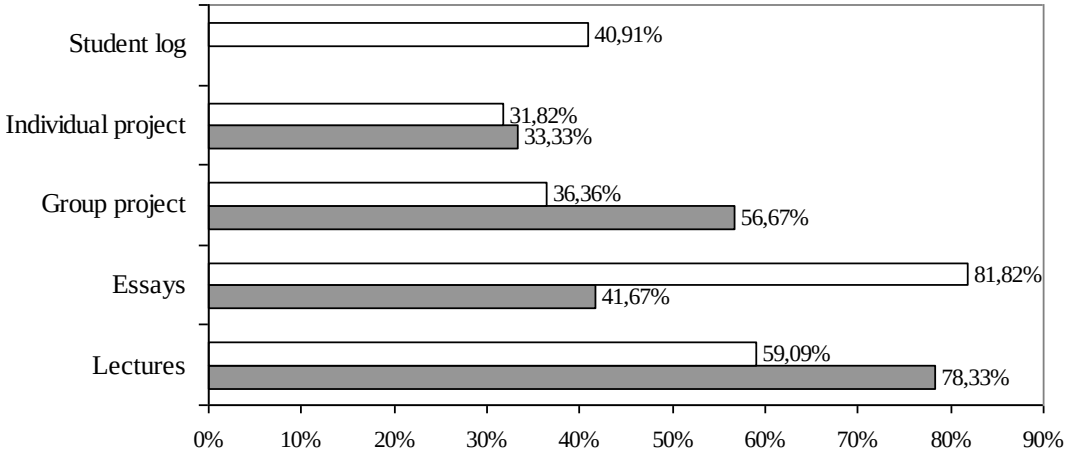


Figure 4. Students' opinion of the amount of gained knowledge

While undergraduates had an impression that they learned the most from the lectures (78,33%) and from role-playing, experienced postgraduates were more enthusiastic by their research during the preparation of individual essays (81,82%). Although their impression that they learned least from role-playing games, they estimated that their previous knowledge increased 50,91% by group role-playing, compared to 53,64% from individual essays, and only 45,41% from individual game on ISO 26000. More than half of all undergraduates highlighted the importance of group project, with 46,67% who considered it a great experience for further team-projects.

While young students had no concerns, the greatest anxiety for the postgraduates was professional conduct in IT companies. Almost two thirds (63,64%) of them reacted that local IT companies insufficiently keep to ethical codices.

General impression about the course delivery was very favourable, and 86,36% postgraduates and 86,67% undergraduates replied that they liked it a lot. Two postgraduates objected that the pace was vigorous and demanding. One student objected that the assignments stimulated a "too positivistic and too objectivistic" observation, while another student reacted that research was "shallow". Only two undergraduates objected that the effort to participate in the course was large. Several students suggested more frequent discussions in the classroom. One student suggested that assessment should be done through a global group role-playing game, which covers different ethical aspects.

Quite a lot of students in both groups emphasised that the immediate teacher feedback and the fast grading of posts was a great motivation to study and work more. Another interesting remark was that with online interactive activities it was impossible to "skive" obligations. On the other hand, skipping of obligations is a very typical activity of younger students, particularly in courses where reading and acquiring new knowledge is predominant to resolving practical exercises.

5. Conclusion

Tabletop online role-playing games can easily be embedded in contemporary learning environments that offer asynchronous learning. Our previous experience with their usage has shown that these games enable students to successfully identify all the threats appearing from ubiquitous IT use with

regard to perceived professional and social responsibilities (Zdravkova, 2009). The experience this academic year has confirmed some basic findings:

1. The approach is similar to everyday student activities, thus it stimulates them to regularly participate in the game and explore it more. Younger students are so excited with the game, so they do not even notice how much effort have they put to finish it, and acquire even more than it was intended.
2. The narrative nature of ethics courses is not attractive to computer science students. They have an impression that they already knew everything. Overt presentation of unknown or unexpected facts and findings stimulate student curiosity to discover more and more, particularly when the rival colleagues are active too.
3. Individual game participation is more suitable for smaller classes with experienced students capable of critical thinking. In previous years, it was preferred by part-time students who work. Surprisingly, students this year found it the less important. Possible explanation might be the huge number of smaller forum (Figure. 1.), which diverged the discussion leading to no final conclusion.
4. Group participation is more convenient and attractive for bigger classes, and younger participants lacking consciousness of ethical issues. They identify with the team and consequently defend the role they selected. With the time, new findings perfectly articulate students' judgments, to express their discoveries into a coherent whole. Good team leaders prepare a corporate final report that sometimes exceeds the quality of individual contributions.
5. The active contribution from the teacher is inevitable. Regular presence in the forum with many small questions and hints toward possible goals usually triggers further study. Fast grading shows students how much have they gained so far, and stimulate striving for a better grade.
6. The dynamic change of content motivates students to express their own thoughts and study more. They inspire research without the feeling of being pressed, making role-playing a valuable learning style for computer ethics courses.

Therefore, role-playing is an exhausting learning method that can be effectively used in learning of computer ethics and social responsibilities.

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