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Devising UIF Model in Designing Usable User Interface Impacted from Shorter-Time-To-Market Phenomena

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Abstract

The research goal is set in devising a UIT (Usability interface Factors) model in designing user interface when there is a time pressure and investigating the todays software company's tendency to shift towards shorter-time-to-market phenomena, while still carrying about high quality of User Interface- UI and User Experience-UX. Currently there is only few published research analysing this tendency and habit of today's companies. Also, there is no published research that addresses efforts in handling this habit by analysing and assessing the impact of IU design systems for increasing the level of usability using UI consistent. However, the complexity of the research landscape and the diverse set of approaches and goals impedes the analysis and advancement of research and the identification of promising research areas, challenges, and research directions. As research, method will use analyses of published research and then surveys and questionnaires to collect information from a representative sample of a broad population using specifically devised questionnaire. Insights and recommendations are provided.

Keywords: Instructional methodology, programming robots, educational methodology, Computer-assisted instruction
JEL classification: A31

Introduction

We have found out that most of the companies that are focused on Software Development in North Macedonia and Kosovo are working on developing Web and Mobile applications. Mostly they are doing usability testing and bugs or crash tests of their software. "Each software system has a part where users test and report a problem and which is taken into account by the developers here".

Important in UI design and usability testing process they have mentioned "the time". Usually they are under the pressure to deliver as fast as possible and meet unrealistic deadlines and usually they do not have time to do properly at least usability testing.

This is important since the users are those that will like or dislike the application and therefore usability testing gives the most important to them feedback information.
In order to improve the current situation they all mentioned the need to some standardized usability testing methodology since different working groups are doing it differently and what is important according to the focus groups and speaking with experts from Companies is that "No application developer involved in the development of the software should not do the testing, but specially trained professional in usability testing". Currently they do not have any professional usability tester and the same people that developed the software are doing the UI testing and that has a lot of bias in the testing results (Myers et al., 2011; Hanssen et al., 2011)

Research methodology

Qualitative Research

For the preliminary phase of the thesis, the Grounded Theory method was selected for the analysis of the prior data, a decision that was based on the type of the existing data and considered feasible approach for extended application in the latter qualitative research phases. The process of our literature review (Trivedi, 2012; Marques et al., 2012; Imtiaz et al., 2013) is an example of our qualitative research. To gather data, we have analysed others work (Banerjee et al., 2013; Garousi et al., 2013) on the field of software usability testing process and their methodologies (Myers et al., 2011; Hanssen et al., 2011; Imtiaz et al., 2013). As result we have conducted possible research gaps on the field and also we have identified a research problem which we aim to solve. We have used statistical survey with a view towards making statistical inferences about the research question being analysed.

Quantitative Research

The questionnaire and survey method have been used for the quantitative phase of the study. Experiments and the generated empirical results are the base for our quantitative research methodology.

The central hypothesis and research questions that will guide this research study are:

H1: If companies use UI design systems than this will improve the overall user satisfaction and increase usability.

H2: If companies use UI guidelines and libraries in their software systems than this will decrease the overall learning curve for the product/platform and increase usability.

Research questions are as following: (i) RQ1: What components contribute to the UX process and how should they be addressed in the design of software systems?; (ii) RQ2: What is important in UX and how should they be addressed in the design of software systems?; (iii) RQ3: What are the contributing factors in proper UI design?; (iv) RQ4: What are the effect and relevance of the UI in increasing the level of usability?, and (v) RQ5: What are the effect and relevance of the UX in increasing the level of usability?.

Results and findings from case study analyses

Our study is built on numerous studies from the reviewed published literature (Myers et al., 2011; Trivedi, 2012; Hanssen et al., 2011; Marques et al., 2012; Imtiaz et al., 2013; Banerjee et al., 2013; Garousi et al., 2013) and then used questioner to include the opinion of companies that work in this field. There were in total 30 participants of this research that where divided in two groups consisting of one company in North

Macedonia and one in Kosovo. Both of the groups also provided their opinion about the global worldwide situation with larger companies. A preliminary survey from all groups has been conducted. The survey questions have aimed to capture and answer the research question previously defined. In this study, the same objectives for both groups will be used. The tests, quizzes and observations have been collected and recorded. Furthermore, questionnaires are recorded and transcribed for analysis. We have done feasibility study, which includes the literature review, and after questionnaire, and empirical research where we measure parameters and comparative research.

Jakob Nielsen, a renowned web usability consultant and partner in the Nielsen Norman Group, and Rolf Molich, another prominent usability expert, established a list of ten user interface design guidelines in the 1990s. There is considerable overlap between Nielsen and Molich's heuristics and Ben Shneiderman's 'eight golden rules'. These 10 rules of thumb further iterate upon Shneiderman's eight golden rules 4 years after Shneiderman's initial publication. The devised UIT (Usability interface Factors) model we have used and integrated both of the approaches in our study and the results are given below.

Conclusion

This research study investigates to find out if there is any benefit in the proper UI design that might increase the usability of the software system. The idea is that when creating UI functionalities, all sites, windows, and parts that have interactivity with the user have a predictable view and location.

The earliest innovations in this field were made from Microsoft, where every part of it is predictable and sometimes the fingers and eyes themselves know where to find any functionality without knowing in advance, based on consistency.

Currently there is only few published researches analysing the phenomena, tendency and habit of today's companies to shift towards a shorter-time-to-market. But there is no research that follow design of UI and test properly the usability of the UI of software, while still carrying about high quality. Also, there is no published research that addresses efforts in devising new methodology for more efficient usability testing methodology. However, the complexity of the research landscape and the diverse set of approaches and goals impedes the analysis and advancement of research and the identification of promising research areas, challenges, and research directions. One of the goals of this study is to try to answer these mayor deficiencies and lack of research efforts and systematically map (classify) the secondary studies in usability software testing. The merits of the research study are the assessment of the impact of UI / UX design systems for increasing the level of usability using UI / UX consistent and devising a new novel methodology. Also provide insights and recommendations when undertaking manual software testing process for practioners and industry experts.

Another important role of the research we aim is communicating the devised UIT (Usability interface Factors) model were we have used the approach with the devised main factors to Usable User Interface design that we tested for usability: 1. Visibility of system status; 2. Match between system and the real world; 3. User control and freedom; 4. Consistency and standards; 5. Error prevention; 6. Recognition rather than recall; 7. Flexibility and efficiency of use; 8. Aesthetic and minimalist design; 9. Help users recognize, diagnose and recover from errors; 10. Help and documentation.

Therefore testing the usability of the above-mentioned factors is crucial. User Interface Design is responsible for the transference of a software system strengths and visual assets to a product's interface as to best enhance the user's experience. This

study may contribute to improve the usability design by invoking the usability experts to realize the benefits of this approach and encourage companies that are under the pressure of short-time-to-market phenomena to implement this approach and interchangeably incorporate usability testing for UI and UX before final release.

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Appendix

Table 1
What Components Contribute to the UI Process

Q1. What components contribute to the UI process and how should they be addressed in the design of software systems?			
UIT (Usability interface Factors)	North Macedonia	Kosovo	Worldwide
1. Visibility of system status.	75	50	80
2. Match between system& reality	75	80	90
3. User control and freedom	100	100	100
4. Consistency and standards	50	90	100
5. Error prevention.	100	100	100
6. Recognition rather than recall.	50	50	90
7. Flexibility, efficiency of use.	75	85	90
8. Aesthetic minimalist design.	25	25	75
9. Help users recover from errors.	50	50	80
10. Help and documentation	25	25	90

Source: Authors' work

Table 2
What Is Important in UI

Q2. What is important in UI and how should they be addressed in the design of software systems?					
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Visibility of system status.	34	43	8	13	2
2. Match between system and the real world.	29	39	14	17	1
3. User control and freedom	39	47	14	0	0
4. Consistency and standards	11	34	39	15	1
5. Error prevention.	34	43	8	13	2
6. Recognition rather than recall.	29	39	14	17	1
7. Flexibility and efficiency of use.	39	47	14	0	0
8. Aesthetic and minimalist design.	11	34	39	15	1
9. Help users recognize, diagnose and recover from errors.	34	43	8	13	2
10. Help and documentation	29	39	14	17	1

Source: Authors' work

Table 3
What Are the Contributing Factors in Proper UI Design?

Q3. What are the contributing factors in proper UI design?					
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. effectiveness	37	49	12	2	0
2. satisfaction	11	34	39	15	1
3. learnability (easy to learn)	43	28	15	13	1
4. memorability	27	41	17	11	4
5. efficiency	21	39	20	17	3

Source: Authors' work

Table 4
Effect and Relevance of the UI

Q4. What are the effect and relevance of the UI in increasing the level of usability?					
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. effectiveness	34	43	8	13	2
2. satisfaction	29	39	14	17	1
3. learnability (easy to learn)	39	47	14	0	0
4. memorability	33	35	19	12	1
5. efficiency	11	34	39	15	1

Source: Authors' work

Table 5
Effect and Relevance of the UX

Q5. What are the effect and relevance of the UX in increasing the level of usability?					
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. effectiveness	37	41	16	5	1
2. satisfaction	34	39	14	13	0
3. learnability (easy to learn)	46	43	17	0	0
4. memorability	39	40	19	2	0
5. efficiency	42	34	16	7	1

Source: Authors' work