The Usability Paradox

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ABSTRACT

This position paper describes the issues surrounding teaching Human Centered Software Engineering (HCSE). We identify a lack of methods in software engineering practices in new media projects. To get a better understanding of that, we are currently conducting a study to identify the current practices in the new media industry. The Human Centered ICT Toolkit is discussed, what it achieved, and what is missing. Looking at problems from an educational viewpoint, we propose to create an integrated HCSE approach by improving the descriptions of methods and their relations giving richer meaning to students and improving understanding of HCSE.

Categories and Subject Descriptors

H.5.2 [**Information Interfaces and Presentation**]: User Interfaces

General Terms

Management, Documentation, Design, Human Factors, Standardization

Keywords

Human Centered, Software Engineering, SE, Education, CASE, UCD, HCI

1. INTRODUCTION

The Rotterdam University's School of Communication, Media and Information Technology (CMI) has a broad scope, with six bachelor studies ranging from (visual) Design to Technical Informatics. With this wide range of expertise, CMI established a research center on Human Centered Information and Communication Technology to conduct research in the field of human-computer interaction, intelligent environments and exploiting these technologies to understand human behavior and user experience as well as informing the design of innovative technology and interactive media.

1.1 Mediatechnology

One of the six studies within CMI is Mediatechnology, a software engineering degree primarily developing for the web and mobile. This field distinguishes itself from traditional software in the degree of user interaction that is involved. Consequently it has usability as a higher priority. Based on discussions we have learned that (almost) none of the organizations in this industry are using formalized methods and methodologies in their development process. In order to get more insight into this new field of software engineering, recently a study has been started. In this study we want to identify distinctive characteristics of media projects and what methods are being used for software evaluation and usability testing.

1.2 Research approach

All of our third year students have an internship in industry. During this period students are asked to report in detail about how their employer's software engineering process is arranged. In particular, they look at how clients and end-users are involved, what methods, techniques and models are used, how and when tests and evaluations are performed. Where possible, also information about whether the projects are finished within time and budget will be gathered.

1.3 Human Centered ICT Toolkit

One of the recent results of our group is the Human Centered ICT toolkit[3]. It offers an overview of methods and tools available for different phases (research, concept, design, development and implementation) in a project. Figure 1 shows the (iterative) phases. The higher goal was to guide Human Computer Interaction (HCI) and Software Engineering (SE) researchers and practitioners (i.e. the students of our six bachelor studies) and to enable them to develop a shared understanding of the overlapping fields of SE and HCI. It was constructed for the following goals:

- A guide to easily get an overview of user centered design and evaluation methods for interactive software and media;

- An overview of methods, tools and techniques available in literature and online resources; student's realistic projects).

- An overview of methods, tools and techniques learned and applied in CMI courses;

Figure 1: The Human Centered ICT Toolkit

- An overview of techniques and tools being employed in different IT- and media enhanced sectors (i.e. student's realistic projects).

The results from the described industry survey as well as the toolkit presenting the overview of the existing methods will be guiding the design and teaching of the curriculum of all six studies.

While the toolkit is a good start in listing the various methods, not all of the original goals have been reached. In the next section we touch upon possible solution scenarios for the identified issues.

2. USABILITY PARADOX

Essential in HCSE is usability testing. In recent years many methods for user-centered design have been developed and many tools are at hand. The design has even been standardized by ISO 13407[1]. The Usability Engineering Lifecycle approach [4] is a well-known example of implementing the user-centered design approach showing how the various elements of such an approach link to software engineering activities. It refers to a general development approach (rapid prototyping) as well as to the Object-Oriented Software Engineering approach OOSE [2]. However, we still see many suboptimal products and interfaces that do not meet usability quality standards. Therefore it can be said that usability practices are apparently not consequently applied. Reasons for this can very from business to technical arguments. In the remainder of this work we reflect upon some directions for improving usability practice adoption.

2.1 Information loss

We define the (human centered) software development process as the product of the five phases analysis, concept, design, development and implementation, as taken from the toolkit model. In an ideal world, people involved in this process are all around the same table, together with all the stakeholders of their product. The real world is far from the ideal situation. However, different phases are handled by different people not sitting around the same table. Handover from one phase to the other is most often done in writing and important information gets lost, resembling the Chinese Whisper game, getting worse with every step.

2.2 Integrated approach

Currently, the model (and implementation) of the toolkit is flat which makes it unscalable when it grows and therefore it's adoption difficult. While it was not claimed that the model is linear, it does not ensure handover of information between the various phases. To remove the loss of information between the phases it is needed that a dimension is added that describes the input and output of every method. By giving the description more descriptive information, it can be made more valuable to students. By adding this dimension to the model and the methods described in it, students might get a better understanding of the intrinsic purpose of the methods and can also better judge how the various methods can be used together.

2.3 CASE tool

To facilitate the proposed integrated approach we argue for the development of a CASE tool build on top of the toolkit. This will primarily be targeted for education. We realize that the use for the real world could be limited, as it has to fit with regular workflow. By using the CASE tool in software engineering processes undertaken by students, all kinds of data can be gathered. This information could be used for further studies regarding the process.

3. CONCLUSIONS

In this position paper we identify that there is a problem with the adoption of usability practices. We also experience a lack of standardization in the field of new media software development. Our conclusion is that these both facts contribute to a fuzzy teaching model for HCSE.

Future results from the study that we initiated to identify software practices in this new media industry will hopefully give more guidance for developing HCSE courses. More descriptive information enables the students to have a better understanding of the issues at hand.

We also believe that the final outcome of this research will be of benefit to the new media industry if we can educate the market through our students.

4. ACKNOWLEDGMENTS

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5. REFERENCES

[1] ISO 13407:1999. *Human-centred design processes for interactive systems*. ISO, Geneva, Switzerland.
[2] I. Jacobson. *Object-Oriented Software Engineering: A Use Case Driven Approach*. Addison Wesley, 1992.
[3] B. Leurs and I. Mulder. UCD education beyond the textbook: practicing a human-centered attitude. In *proceedings of CHI Nederland Conference*, 2009.
[4] D. Mayhew. *The usability engineering lifecycle: A practitioner's handbook for user interface design*. Morgan Kaufmann Publishers, 1999.