Are software companies aware of UX?

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ABSTRACT
The efforts of addressing user experience (UX) in product development keeps growing, as demonstrated by the proliferation of workshops and conferences bringing together academics and practitioners, who aim at creating interactive software able to satisfy their users. Unfortunately, human-centred design and methods addressing usability and UX are always mentioned in research papers but yet very seldom applied in the current practice of software development in industry. In this paper, some findings of studies we have recently performed with software companies are reported. They show that either companies still neglect usability and UX, or they do not properly address them. Thus, in this workshop that seems to consider UX evaluation as a usual practice and aims to optimize the impact of UX evaluation feedback on software development, our provocative statement is: Are software companies (at least) aware of UX? The studies summarized in this paper show that, in many cases, the answer is NO. We are working to overcome the current situation and the paper concludes by providing some suggestions to fill the gap between research and practice of UX.

Keywords
Software life cycle, human-centered design, ethnographic studies.

Categories and Subject Descriptors
H5.m. [**Information interfaces and presentation (e.g., HCI)**]: *Miscellaneous*; D2.10 [**Software**]: *Methodology.*

General Terms
Design, Human Factors.

INTRODUCTION
Designing for UX requires understanding user requirements from both a pragmatic (system functionalities and interaction) and a hedonic point view [16]. It is necessary to iteratively design and evaluate prototypes, according to the human-centered design (HCD) process [7]. Unfortunately, HCD and methods addressing usability and UX are always mentioned in research papers but yet very seldom applied in the current practice of software development. Our position is that, in order to successfully address interplay between UX evaluation and system development in current work practices, we still have to do a lot in order to make software companies aware of the importance of UX.

In this paper, we briefly report some findings of recent studies involving software companies. On the basis of such studies, we provide some indications for making UX an explicit goal of software developers, as well as suggestions on how to fill the gap between what Human-Computer Interaction (HCI) researchers propose about design and evaluation of UX and the activities performed by software engineers in their daily practices of software development.

ABOUT USABILITY ENGINEERING IN SOFTWARE COMPANIES
Our research group has been working for defining HCD techniques and methodologies that could be pragmatically integrated in the work activities of software developers. For example, in [4] it was proposed how to augment the standard waterfall life cycle to explicitly address usability issues; the Pattern-Based (PB) inspection reported in [9] has been defined in order to provide a cost-effective method that could satisfy the companies' need of effective and easy to use evaluation methods.

Despite the efforts of HCI researchers, HCD approaches are applied only to a limited extent by practitioners, as shown in [3], [6], [8], [10], [11], [14], [18], [19]. Such studies indicate that the main reasons why companies are reluctant to adopt HCD practices include: 1) time and costs of the HCD methods; 2) cultural prejudices; 3) lack of frameworks guiding the software development team in applying HCD methods. Some studies actually involved designers with a strong HCI background, and even HCD practitioners (e.g. [11], [18]). Thus, the situation is even worst when software engineers are addressed.

The above results have been confirmed in our recent survey reported in [1]. Specifically, we collaborated with colleagues of the Aalborg University to investigate the practical impact of usability engineering in software development organizations in two different geographical areas in Europe, namely Northern Denmark and Southern Italy. The survey was conducted in order to identify possible obstacles that prevent organizations to take into account usability issues. It showed that the number of organizations conducting some form of usability activities is rather low. Even if software developers are becoming

more aware of what usability is and of its importance in order to improve their products, one of the main problems still remains what we call “Developer mindset”, i.e. many developers have their minds set more on programming aspects, technical challenges and functionality of the product than its usability. Still too many of them do not know well what usability is. Another main obstacle they report is the lack of suitable methods that could be integrated in their work practices without demanding a lot of resources. Software development companies do not consider involving final users during the requirement analysis and the evaluations activities. This pushes usability researchers and practitioners to deeply consider devoting more attention on how to transfer academic work into practical value for industry. As we said in [1], we believe “it is responsibility of academics to translate scientific articles, which formally describe evaluation methods, into something that makes sense for companies and it is ready to be applied”.

HOW ETHNOGRAPHIC STUDIES MIGHT HELP?

As follow-up of the study in [1], we wanted to know more about the advantages and problems of usability engineering as perceived by individual organizations. We focused on companies whose software developers appeared to be motivated to improve the usability of the products they develop. The key question to be addressed is why such developers do not push for the adoption of usability engineering methods in their development processes. We also decided to consider ethnographically based research in order to get an in-depth understanding of the socio-technological realities surrounding everyday software development practice [5], [15] this should provide other indications on how to overcome obstacles to a wider account for usability engineering.

In this paper, we briefly report on a study we have performed in order to know more about the software development life cycle of a company of medium-high size. The study had two main objectives: 1) to view, capture and understand the work practice by employing observational methods and in-situ interviews; 2) to integrate HCD activities in key points of the software development life cycle, such as interviews and usage scenarios during the requirement analysis, as well as prototyping and evaluation during system design.

The study was conducted at a medium software company located in Southern Italy, which develops products in different domains, primarily public administration and bank. The company accounts three different Business Units (BUs): Public Administration, Finance, and Research. The latter is mainly involved in research projects. Each BU could be considered as a separate small company, with its own personnel for carrying out all the activities in the software life cycle: project leaders, analysts, designers, developers, BU managers, etc. All BUs adopt a traditional waterfall life-cycle model for several reasons, primarily management background and project constraints, which completely neglect usability and UX issues. The study has been carried out in the Public Administration and Research BUs. Two master students participated in the study, each one involved in the activities of a BU. Their work was part of their master thesis in HCI. They were in the company for a total of 120 working days. Specifically, Rossana, the student in the Public Administration BU, was assigned to a project for creating an application for tourists visiting a certain town, running on a mobile device; it was committed by the town municipality. Diego, the student in the Research BU, was assigned to a research project on “Technologies for Situational Sea Awereness”, whose aim is to develop hardware and software to provide services to various people, from oceanography researchers to skippers, and others.

The details of the study and the analysis of the collected data will be described in another paper we are currently writing, and can be discussed at the workshop. We summarize here some findings, which were confirmed by the interviews to the BU managers, performed about a month after the end of Rossana’s and Diego’s work. As most important effect, they were surprised to see how effective and efficient the HCD methods that Rossana and Diego used were. Thanks to this experience, they finally understood that the minimal resources spent in the iterative prototyping were widely fulfilled by the obtained benefits.

The Research BU manager appreciated a lot the fact that Diego, in the requirement analysis, insisted a lot for including a detailed specification of user requirements. He did it and also performed semi-structured interviews to validate such requirements with other stakeholders. The manager actually understood how fruitful these activities were and how meeting other stakeholders helped resolving several concerns. Diego insisted for involving more real users, pointing out that how different final users are from other stakeholders in terms of needs and expectations, but this was not possible.

Both Rossana and Diego used paper prototypes a lot, discussing them in participatory meetings with other stakeholders, i.e. the other project partners in the case of Diego research project, while Rossana organized short meetings with all designers. Because she was involved in the design of an application devoted to people visiting a certain town, she was able to involve a few other persons in the company (secretaries and staff members), who acted like tourists interacting with the prototypes. Even if the approach might appear a bit naïf, HCI researchers know how useful these “quick and dirty” methods might be. To test a running prototype with real users, Diego contacted two friend of him, who are professional skippers, and

performed a thinking aloud test. They pointed out a feature that was not as useful as designers considered, and indicated some other problems.

After an analysis of various tools for rapid prototyping, Diego selected Justinmind Prototyper (http://www.justinmind.com/) and used it for creating several successive prototypes. The BU managers are now enthusiastic of this tool and are getting it to use in the early design phase. Rossana and Diego also performed several heuristic evaluations of the prototypes. Thus, they used methods that are very cost effective in order to demonstrate that methods that require limited resources and little training of company employees, who could perform them, actually exist.

What performed in the above study is in line with other works. For example, Jim Hudson states that a variety of methods have to be used at all phases of the product life cycle [5]. For example, in order to understand customer needs, the design team can choose from casual conversations to more formal focus groups. He also found very important discussing with small groups of customers on the paper prototypes once or twice each week. During these meetings, customers have to be observed during the interaction with a product prototype.

SUGGESTIONS

The ethnographic study confirmed how it is important to develop paper prototypes and to discuss them with other stakeholders, including end users. This is a first important suggestion for companies. It might appear that it is not a novel finding, but it is worth emphasizing that it is obvious within the research community, whereas the actual problem is to transfer the use of iterative prototyping in the practice of companies. With our ethnographic study, we provided evidence for the company of the advantages of informal meetings in which several stakeholders, including end users, analyse prototypes, starting from those on papers. This study and other previous experiences of ours on HCD in practice (e.g., see [2]), as well as other relevant work in literature [20], provide another important suggestion: running prototypes have to be evaluated with samples of their end users in a real context of use, since “end users can raise significant issues about system usability only when they get down to using the system, or even a running prototype, in their real activity settings”. Only then, they are able to provide the right indications about what is working well and what is not. If this is true for usability, it is further true for UX, both because usability is part of UX and because the subjective aspects that UX impacts can be really assessed only by end users in real contexts of use.

In several interviews conducted with company managers as follow up of the study in [1], it emerged that another reason why companies neglect usability and UX is that such requirements are not considered in public tenders. In most of their work, company develop software systems committed by public organizations, which specify the system requirements in Call for Tenders. It is evident that the companies’ interest is to satisfy all and only the requirements specified in the Call. Thus, another suggestion for changing the current situation is to convince such public organisations of the need of explicitly mentioning UX requirements in their Calls for Tenders. According to this, we are already in touch with people working at the office of the Apulia region (the region where our University is located), which is publishing in the last years several Call for Tenders about ICT systems, and we are discussing such issues. In trying to convince them to address UX, we are actually facing the lack of usability and UX requirements that are objectively verifiable; consequently, it is not easy to specify them in the Calls. HCI researchers are urged to find proper solutions to this problem.

Our last suggestion is that, once we succeed in getting companies aware of usability and UX, we try to satisfy their request of suitable methods requiring limited resources and help integrating them in their work practices. Current situation shows that this is still very challenging. Only a few scattered experiences of designing and evaluating UX in practice are reported in literature. For example, at Nokia, which has a long history in designing for experience, the product development process includes continuous evaluation of usability and UX in different phases of the life cycle. After the release on the market of the product, feedback is gathered from the field through controlled and uncontrolled studies in order to collect information for improving successive products [13].

Despite the effort spent by Nokia and some other companies in designing for and evaluating UX, there is yet no consensus on approaches and methods to be widely adopted in order to develop software systems able to provide users with pleasurable and satisfying experiences [12], [17]. We look forward to the discussions at the workshop, hoping that they might provide more insights.

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