

Desenvolvimento Ágil, Usabilidade, e End Participação do usuário

Agile Development, Usability, and End User Participation

Nielsen, Lene; Associate Professor; IT University, Copenhagen
lene@itu.dk

Madsen, Sabine; Associate Professor; Roskilde University
lene@itu.dk

Abstract

This paper contributes with insights in a case study on the global emerging practices and challenges caused by the advent of agile software development and by suggesting how to improve practice. We report from a worldwide study of usability professionals, which shows that the usability professionals share a forced development and innovation in their practice that stem from their clients' adoption and use of agile methods. We also report from an experiment that set out to cover some of the challenges that the usability professionals meet when working with agile methods – the problem of including user input in agile development.

Keywords: *usability; global practice; agile methods and user input.*

Introduction

On a global scale agile development methods are becoming more and more widely used in practice (Abrahamsson et. al 2009, Dybå, & Dingsøyr, 2008). Agile methods structure the software development process into short-cycle time iterations (typically of 2-4 weeks durations) in which working software is delivered to the customer at the end of the iterations (Beck, 2000, Cockburn, 2002, Rising, & Janoff, 2000).

In agile development requirements are referred to as user stories. A *user story* is one or more sentences in everyday language that captures a feature that the system might cover. These are produced by customer representatives. Recently some researchers have pointed out that when it comes to innovation, feedback from the customer representative(s) is not enough (Conboy & Morgan, 2011) and that customers and end users are two different stakeholder groups (Kautz, 2011). Agile method places new demands on traditional usability methods and how the results here of are being incorporated into the development process.

In this paper we investigate these new demands and the influence hereof on HCI practice and the practitioners. Furthermore we contribute with a suggestion for a usability method that can include the voice of the users in the agile development. Yet, so far only little agile research has aimed to understand and ensure the participation of this latter stakeholder group, i.e. the end users.

The case study

There are several reports on integrating User Centered Design (UCD) with agile methods most often the users are integrated into the agile cycles as objects for user studies or as participants in usability tests (Silva da Silva, 2011). The studies often focus on single company practice (e.g. Obendorf & Finck, 2008) or on trials performed in the meeting between academia and practitioners (e.g. Sy, 2007). To our knowledge no one has studied the influence of agile methods on HCI practice.

The studies of usability professionals tend to focus on practice and the discrepancies between theory and practice (Nørgaard & Hornbæk, 2006). We address the circumstance that agile development methods force the usability professionals to change and from this we develop new ways of incorporating usability in the process. We look at this phenomenon in a global context and report from a study involving 12 usability professionals from: Australia, Brazil, Canada, France, Germany, Japan, Korea, Russia, Spain, Turkey, UK, and US. All are members of UXalliance, an association of user experience companies located in 24 different countries. The interviewees were selected among participants in a bi-yearly meeting and represented diversification in both geography and maturity of markets. Each participant has been interviewed for approximately 45 minutes.

From the outset the study did not focus on agile methods, but the subject turned up in most interviews and the material have subsequently been analysed for influences of the agile method on HCI practice. The research has followed established procedures for qualitative data collection and analysis (Guba & Lincoln, 1998).

The empirical findings

The usability professionals explain that more and more companies are using agile methods. It becomes increasingly important for them to adapt their practices to the agile way of working in order to keep up with the market and get customers. Thus, the innovations in the HCI practices are driven by the *customers* and their preference for and use of agile methods rather than by the HCI community itself. This creates challenges: firstly, it means that the usability professionals find themselves in a situation where they have no prior experience, formal methods, and thorough understanding of agile development to draw on to meet the new demands of the market. Secondly, there are aspects of the agile way of working that challenge the usability professionals' underlying assumptions about what constitutes "good and proper usability work".

Challenges

If HCI methods are to play a role in agile software development they have to be performed as part of the iterations. This in turn means that the time available for recruiting end-users, collecting data on users, performing tests, for analysing and reporting the results becomes very short.

The professionals that had been confronted with agile methods raised a number of concerns that originates from their professional identity as being researchers and the skills of the usability professionals.

As usability researcher they are concerned with validity and research ethics. Some feel that the agile methods force them to do so few tests that there is a risk that the tests get superficial.

"It didn't get that level of testing that we are used to getting." (Participant 1)

One of the reasons for not getting a proper level of testing is inherent in the agile method, the recurrent cycles that focus on one functionality at a time. This focus on single

functionalities might prevent an understanding of the user experience of the unity of functionalities and the context in which they are going to work – the bigger picture.

“Even in the perspective of agile, there is a risk when you do unit tests. It might work at a unit level, but not at a system level.” (Participant 12)

The unit perspective creates problems, but some professionals report that it is possible to overcome these.

“But if you sort of can run a parallel stream thinking about the big picture and taking it from the perspective of that here are broader scenarios that we are trying to achieve, and prune your testing.” (Participant 1)

The usability professionals are challenged on their research approach which values knowledge based on data, thorough analysis, validity, and extensive reporting. The agile method forces the professionals to create meaning from a small sample and be able to understand the system’s overall scope from a few functionalities. To create a broad understanding of the system takes experienced usability professionals that can draw on their knowledge from previous work.

“(…) it depends on the researchers ability. If we did a website and a user said he didn’t notice the label. Why didn’t he notice the label? Maybe because of the colour or the word? The researcher should know what the user think in the process.” (Participant 6)

Furthermore the role of the usability professionals’ change from a person that focuses on problems – a researcher - to someone who also has to find solutions – a designer.

“On the other hand the need for real user centered design will go up. For what they still do not have internally are the designers, interaction designers.” (Participant 5)

Some companies embrace this challenge others find it difficult to adjust.

“I think we will need to do design. I would prefer to be a consultancy firm.” (Participant 2)

The professionals also report having to change the ways they plan their work, which makes them insecure.

“The biggest strain is that you have to let go of some of the formalities. You might not know the package you are going to test until 48 hours before. There are ways to plan, but it gets very complicated because you don’t know what you are going to test, the depth of what you going to test, and what the problems are. (...) The era of big deliverables is dead.” (Participant 12)

Even though it was reported that overall the usability professionals see the market maturing, a fear in the less mature markets is that clients just call it agile from an economical perspective.

“Sometimes clients think if they want to have results very fast and with a low budget, they go to agile.” (Participant 8)

New practices

The interviewees explain that when they work with agile customers they have to be able to conduct and report the results quickly, typically at the end of each agile iteration. To be able to do this they have developed new key practices, which they refer to as *feedback days*, *user workshops*, and *micro testing*. A typical process includes stakeholder involvement, prototype discussions which focus on the issues to be tested, user tests, oral delivery of results, discussions of design decisions, and new prototype development. The professionals describe the new practices in the following way.

“When they have their turn around or circles we always do these feedback days, which means everything is done in one or two days to close one cycle.” (Participant 5)

*“The other sort of thing is agile and this increasing need to think of stuff to spin through, being able to testing quicker. Rather than you plan something months out.”
(Participant 11)*

The quotes show that the usability professionals have developed a speeded-up way of working where they do all the normal activities involved in usability testing - i.e. user recruitment, testing, and reporting - over one to two days at the end of each iteration.

In the interviews several reported that new business opportunities often occur when clients want to have results faster and cheaper. This made many look at online solutions for reducing the costs – micro tests. The micro tests can reduce expenses both in connection with tests and with changes in solutions. A micro test site is a website that provides a set of well-defined tasks that the user can do remotely and which records the user’s voice and cursor movements.

*“I believe that the future of our world is micro testing. It is much more clever to do a test with a small budget than to do a big test at the end - and sometimes you can’t change it.”
(Participant 9)*

The demands and pressure the HCI professionals feel are alike worldwide. However, as a group of professionals they can also see benefits in the new practices that the agile methods force them to develop and apply. All interviewees report that they feel threatened on their professional pride and attitude and at the same time they currently strive to come up with solutions. So far the user input is seen as something that can happen at the end of a cycle, as user tests, we suggest including user feedback in the beginning of each cycle to support the already existing user stories.

Micro participation

There are at least two points in time at each iteration, where user participation is relevant, namely before, as micro participation, and at the end, as micro tests. In the following we introduce a new practice that is built on a micro testing website and includes the constraints of the agile development method – micro participation.

Micro participation refers to instances of very short duration (approx. 15-30 min.) during which input from end users is collected and incorporated into the development process as user stories. The end user input is obtained through unmoderated online tools, hereafter referred to as micro participation sites.

Before each iteration the customer representative is charged with the task of identifying, prioritizing, and selecting user stories. Here the participants’ input about their daily life, contexts, needs, and their design ideas facilitates the customer representative’s work.

At the beginning of the iteration the customer representative informs the team about the user stories that s/he wishes to have developed in the next iteration. The team then determines how many of these user stories they can commit to complete within the iteration.

Next the team elaborates the user stories in a team meeting. Coding and test activities are performed in accordance with the elaborated user stories.

At the end of each iteration the working software is demonstrated to the customer representative(s) and released for customer acceptance testing. However, agile methods do not prescribe end user testing. Yet, at this point in time it is also relevant to obtain information about end users’ ability to solve tasks using the working software. Our focus is on the beginning of each cycle and we propose to let a number of participants conduct storytelling session via a micro participation site. In this way user stories for the next iterations can be identified by the usability expert, prioritized and elaborated by the customer representative thus basing the user stories on both customer feedback as well as user input.

In the next section we demonstrate the practical application of the concept of micro participation. We use the identification of user stories as our example and describe the activities performed by developers, participants, usability professionals, and customer representatives to accomplish a micro participation instance.

The case

Inspired by the user stories on the website AgileModeling.com we chose to focus on an online parking ticket system. These are some of the user stories from the website:

- Students can purchase monthly parking passes online.
- Parking passes can be paid via credit cards.
- Parking passes can be paid via PayPal™.

We focused on creating an open process that allowed for user input for a future and ideal online parking ticket system. To conduct the practical experiment we used the tool UsabilityForce. Many similar systems exist, however, for most of these the client has to recruit the test participants

The tool offers online unmoderated usability tests of specific tasks that can be done within 20-30 minutes. The tool allows for tracking of cursor movement and simultaneous voice recording. Usabilityforce.com recruits the users and screens them for their ability to think aloud before they enter into their database. The users for a specific test are then found among the pool of users in the database.

UsabilityForce promises a response time within 48 hours from the task is sent to the videos are uploaded. The users are notified by mail and earn a small incentive for each test they participate in.

The users are provided with written tasks and access the webpage to be tested. They know they have to spend approx. 20 minutes on the tests tasks. While they test their voices are recorded and their screens captured.

We decided on a target group of people working for large companies that suited the participants in the database.

Design of the micro participation site

UsabilityForce demands a web-based solution and we designed a simple four-page site. Contrary to the ordinary use of UsabilityForce the users did not have to test a prototype, but ideate on solutions to the online parking ticket system. This was emphasised in the introductory email as well as in the instructions on the screen. The instructions were simple and stated that the users had to visualize a solution and tell how they could imagine solving the different tasks. The phrase “tell us” was used several times in the task descriptions.

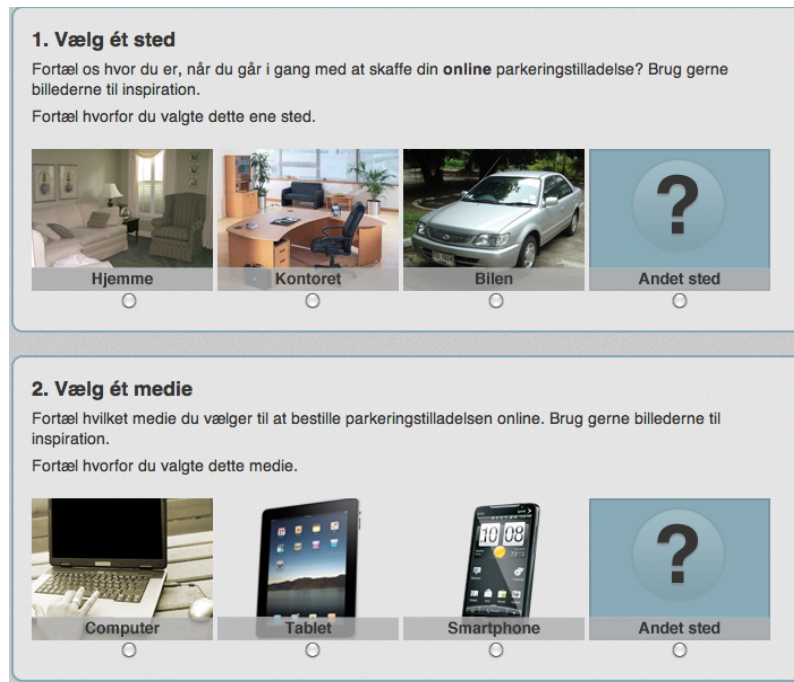


Figure 1: Screen dump of the micro participation site

In order to develop the tasks we used storytelling as a guiding principle. According to the prototypical story form (Mandler, 1983) a story begins with a setting in which characters, location, problems, and time is presented. After this one or more episodes follow. Each episode develops towards a goal and includes obstacles for reaching the goal. The prototypical story form inspired us to divide the tasks into beginning, middle, and end. The beginning (page 1) presented the goal: “Imagine that you have to work for a major Danish company for the next month. In order to have free parking you need a parking permit that covers the period you are working there”. The next page asked the participants to decide the place they would go online and the media they would choose (both part of the setting). From this the story had a setting and a direction (plot) that the participants could elaborate upon.

The next questions were very open: “How do you order an online parking permit? What will you do first? What happens next?” (the episodes). The last page ended with questions concerning obstacles: “Consider the weaknesses in the solution. What can go wrong? Which steps are vulnerable and might fail?” The phrasing of the tasks allowed the participants to speak freely and prompted them to come up with design ideas.

The design of the website considered the principles of agility as it took approx. 10 hours to construct including adjustments. In the future the website can easily be modified and reused. We estimate that it can be set up in 3 hours.

For the experiment 3 participants were recruited from UsabilityForce’s participant database. Later on 5 additional experiments were conducted. However, this paper only reports from the first three experiments.

The outcome

The purpose of our experiment was to test if it was possible to engage end users in a manner that provided: (1) fast results, (2) relevant information, and (3) easy identification of user stories.

In keeping with the first criteria we received three videos of approx. 20 minutes duration in less than six hours. In these videos the participants proved very competent in speaking about their preferred use situation and choice of media as well as in suggesting design ideas.

With regard to both the preferred use situation and choice of media the textual descriptions as well as the pictures on the micro participation site were important in order for the participants to understand the task and to get started. Thus, all three participants read each task out loud, listed the pictures and pointed with their cursor. After they had understood the task they provided additional information about their own everyday life and job situation in order to argue for their choice of use situation and media.

“Where I'd like to get it from? Well, then either you had to have the foresight enough to have done it from home, if you had to work for others. Now actually I work often as a consultant, so doing it from home or from the office, there you have to have foresight. I could often imagine that it would be while sitting in the car, that you think oh no, now I have to have the parking permit. And it might be clever to buy it for an entire month at a time instead of doing it for short periods of time. So I'd probably choose the car.” (Participant 2, authors' translation)

In this example the participant explained that she was working as an external consultant and therefore her preferred use situation would be the car or a café and the choice of media would be her Ipad or Iphone. The user story here would be:

- Users can purchase permit on mobile phone/tablet
- User can pay on mobile phone/tablet
- Parking attendant can validate permit bought on mobile device

While the users were speaking they frequently referred to their everyday experiences and as such they were in fact telling a story about, and adapting the task to their own life world. This made it possible for them to relate to the ordering of an online parking ticket as something they could see themselves do and it provided us with valuable context information.

With regard to design ideas it was easy for all three users to come up with *many concrete design ideas*. There were two reasons for this. First, as the users were able to understand the task in the context of their daily lives they were also able to bring their use experiences with other IT systems into play. Together the users had a broad knowledge of many different types of IT systems and they described their design ideas by making references to specific web sites and types of functionality (e.g. the area selection and calendar function on travel web sites, confirmation notification via email, mobile phone payment, print-self tickets for cinemas and trains, etc.). This in turn made it easy for us to understand their ideas and to write them down as user stories.

Comparing the user stories, presented in the beginning of this paper, to the user stories we extracted it is evident that in the experiment we were able to capture more contexts and thus understand the different contexts demands on functionalities (e.g. when users buy permits on the go, they cannot print a ticket and other solutions are demanded).

Second, the users were aware that the session would last for, and that they therefore would have to speak for around 20 minutes. This meant that they took time to elaborate on the details and the advantages and disadvantages of each design idea; that they let one idea lead to another; and that they would re-think the task in light of other media choices if they had extra time.

As the participants used their everyday lives and IT experiences as reference point and because they took time to elaborate on their design ideas they did indeed provide much relevant information, which was easy to translate to user stories. In fact it was so easy to follow their position on the page and to keep up with their talk that we could write down user stories – e.g. “print-self ticket to place in the front window of car” - while we were watching the videos.

The analysis activity that we, as HCI professionals, undertook to identify user stories took approx. two hours.

Conclusion

In this paper we report from an international study of usability experts' new practices and from an experimental case study of end users' ability to formulate design ideas using an unmoderated online tool. We have uncovered the problems that the usability experts face when working with agile methods, namely less time for preparation and no identification of user input in the method. Therefore we conducted an experiment, which showed that story telling allows the end users to access their experiences in a direct and spontaneous way, thereby providing valuable insight into their daily lives, contexts and needs. Even though micro participation is asynchronous it helps establish a dialogue between the end users, HCI professionals, customer representatives, and development team when end user input is translated to user stories and incorporated into the development process.

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