Existing but Not Explicit - The User Perspective in Scrum Projects in Practice

Åsa Cajander[1], Marta Larusdottir[2], and Jan Gulliksen[3]

[1] Uppsala University, Box 337, SE-751 05 Uppsala
[2] Reykjavik University, Menntavegur 1, 101 Reykjavik, Iceland
[3] KTH – Royal Institute of Technology, Lindstedsvägen 3, 10044 Stockholm
asa.cajander@it.uu.se, marta@ru.is, gulliksen@kth.se

Abstract. Agile software development processes are becoming more common, but this does not mean that the user perspective in the development is catered for. It has its challenges to integrate the users' aspects in Scrum projects in practice. In order to better understand these challenges we have interviewed IT professionals using Scrum focusing on four different areas: responsibility for the user perspective, emphasis on usability and user experience through documentation, usability activities with users and the organisational and contextual settings for emphasizing the user perspective. Results show that the responsibility for the user perspective is unclear in Scrum projects, and that often the user perspective is neither discussed nor described in the projects. However, the user perspective is often present through informal feedback used to understand the context of use and inform design for example. Finally the paper presents implications for working with the user perspective in Scrum projects.

Keywords: Usability, user experience, user perspective, responsibility, agile software development, Scrum.

1 Introduction

Systems development processes and methods used in industry vary over time, and historically different value sets have guided the development of processes for IT projects. The purpose of a process is often to provide structure, predictiveness and quality to software development practices and to be a container of the collective knowledge and experiences of software development work within a particular context [1]. Since the 1990s, agile processes, and especially Scrum, have become more popular [2; 3] as a reaction to the size and complexity of the presiding processes, such as RUP or the waterfall model. Scrum as a development methodology has received increasing attention over the last years, mainly due to its agile nature and openness for flexibility, and for the skills and driving forces of the team members. One of the basic values of Scrum is speed and communication [4]. However, the requirements on quality, usability and other aspects of great importance for the users are not explicit in the process.

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Many software development practitioners in industry regard Scrum as a user-centric process, for example by introducing user involvement through user stories, and by its iterative and communicative nature [5]. This aspect of Scrum would then concur with the values of many user centred design approaches, and this may then explain why Scrum has become so successful. However, the user perspective is not a mandatory part of the process and not something that can be taken for granted while applying Scrum in software projects. Even though many development organisations are describing great success of using agile development processes, none of these processes explicitly describe that usability activities should be included in the process [6] and Scrum has particularly been criticized for not sufficiently including the user perspective in the process [7]. One of the challenges mentioned by IT professional who are including the user perspective in software development is that it is hard to find time for usability activities such as user centred evaluation [8]. Additionally, it is challenging for the IT professionals to maintain an overview of the total user experience of the product in Scrum projects. It has been suggested that sharing documents, artefacts and particularly knowledge between the development team and the usability specialists is one way of maintaining the overview or the big picture of the user perspective [9]. Moreover, it has been suggested that having a usability knowledgeable person in the teams or at least that more face-to-face communication happened between the team members and the usability specialists [10].

Previously we have studied the application of usability evaluation methods in Scrum projects in practice [11]. From this study we concluded that many informants gather informal feedback on their design using qualitative evaluation and only very few conduct quantitative evaluation by asking more than 10 users to participate in thorough user evaluation. Typically thorough usability evaluation is conducted as seldom as twice a year, often by contracting an external usability expert [12]. The main reason for usability evaluation not being conducted more frequently is time constraints. However, some usability activities, such as workshops, are frequently used in Scrum projects [13]. These activities are often informal, ie do not include measurements or rigorous usability evaluations, and therefore these fit better to the fundamental principles of Scrum, which are speed and communication. Additionally producing incremental deliverables in short project periods is another popular and important Scrum feature. Another challenge experienced by the interviewed usability specialist in the Scrum projects was maintaining the overall vision of the user perspective, despite of the Scrum tradition of slicing projects in smaller parts.

In this paper we will further explore how the user perspective is affected by the fact that our informants are using the Scrum process in practice. We have chosen to address the occurrence of a user perspective in four important areas: responsibility for the user perspective in Scrum projects, activities including the user perspective in the development, emphasis on usability and the user experience through documentation, and the organisational and contextual settings for emphasizing the user perspective. Through such an analysis we aim to understand the need for improving the Scrum process to facilitate the inclusion of a user perspective more explicitly in the daily work of the IT professionals.

2 Background

One important task in planning your software development project is defining the responsibility for particular activities. Responsibility here may refer either to the state of having a duty to deal with something, or the state of being accountable or to blame for something [14]. This can be seen as either a rule based view of responsibility, or a consequence based view, as in [15]. The notion of responsibility for usability is closely related to discussions of responsibility generally in social science in relation to groups. Here phenomena such as "the diffusion of responsibility" and the notion of "somebody else's problem" are interesting to investigate. Diffusion of responsibility is a social phenomenon, which might occur, in larger groups, where no one in the group takes responsibility for phenomena. When a task is placed before a group of people, there is a tendency for each individual to assume someone else will take responsibility for it—so no one does. This is a negative outcome that may occur in groups where the responsibility is not clearly assigned. Previous research in the area has indicated that the diffusion of responsibility may have negative effects in systems development in practice [15].

Stating goals for usability or user experience is one way of describing the emphasis on the user perspective explicitly and giving the IT professionals some motivation for including the user perspective in their work. Stating usability goals has been highly rated by IT professionals as a way to integrate usability in software development work [16]. Identifying the usability requirements of a system as accurately as possible has been pointed out being a major challenge in agile projects, since it involves the customers rather than the actual users [6]. The results from a recent study show that stating usability goals in Scrum projects was highly rated by the participants, and still less than half of them did explicitly state usability goals [13]. Researchers have suggested that usability goals or issues could be combined with other existing documentation in Scrum, such as the description of the goals as acceptance criteria for the user stories [7; 17] and capturing usability goals in user stories or in the product backlog [18].

Recent results show that many IT professionals frequently conduct some kind of usability activities in Scrum projects, and that they generally rate the activities as being useful [13]. The highest rated usability activities according to this study were workshops, informal usability evaluation with users and meetings with users. It is noticeable that all of these activities are rather informal. Similar results have been presented in a study showing that all kinds of prototypes are used more frequently in Scrum projects than when using other software development processes [2]. A recent extensive literature study shows that the most common usability activities in agile development are low fidelity prototypes, user testing aimed at refining the prototypes in the next iteration and inspections [17].

Organisational and contextual settings for integrating user centred design into agile software development successfully have been explored in several research studies. Close collaboration between the development team and the usability specialist has been considered as one of the biggest success factors for integrating the user perspective in Scrum projects [10; 17]. The usability specialists' understanding of their job role and the need to establish, protect and communicate an overall team vision was

pointed out as the two major themes highly important for the success of integrating user activities in agile development [19]. Often user experience issues are considered important both on strategic and operational level, but the current work processes and management styles can limit the impact of the usability specialists [20].

3 Method

The 21 informants were found through personal contacts, a presentation at an HCI interest group, social media and suggestions from informants already interviewed. The informants who participated in the study all worked with Scrum and were interested in integrating usability activities into the Scrum process.

In total there were 7 females and 14 males, their age reached from 29 to 55, and they had been working from 1 to 15 years in the industry. Their education varied from having no university education to having a PhD degree. When our informants were asked about their roles we got various answers such as: usability designer, user experience manager, usability specialist, application designer, interaction designer, senior system developer, user interface developer, usability specialist, business architect, sales person, developer, tester, Scrum Master and Product Owner. Some of the informants stated that they had two or three roles. The informants worked at 14 companies in various organisational contexts. The main types of organizations were product development and consulting companies. Some of the companies were international, having employees worldwide. The number of employees reached from 8 to 12.500. Generally, the Scrum process used had been adapted to the context of the organisation. Some companies had combined Scrum with features from other systems development processes such as Kanban and Extreme Programming. We asked the informants about their work in one specific project since we wanted to understand the context of their experiences, and we did not want them to describe several anecdotal things from a number of project. We also asked them to tell about a project that they had been working on lately so that they would have it fresh in memory.

The data gathering method used for our study was semi-structured interviews. An interview template was developed and the questions were adapted in accordance with the organizational role of each informant, their background, and their experiences working with Scrum and usability. The interview template included the following topics: Background including role in company, responsibilities and education; experience from using Scrum in one particular project; their activities for involving users in that project; their view on responsibility for usability and other remarks. The interviews lasted for about one hour. The interviews were recorded and detailed notes on paper were taken. Most interviews were conducted by two researchers interviewing one person, one acting as a conductor and the other as a note taker. All recorded interviews were transcribed verbatim, most of them by an external consultant. The quotations provided in the text are not always verbatim, but sometimes slightly rephrased in order to be more readable and representative. We refer to our informants as males despite their real gender when describing their comments.

Data from different interviews were compiled and iteratively analysed by two researchers. During a thematic analysis [21], data was reviewed, organised and read through to identify themes. At this phase, mind maps were used. Data was then reviewed again to iteratively develop these themes and to categorize the statements of the respondents according to the themes in a software program for data analysis called Atlas.ti[1]. Some themes represent a set of inductive constructs while others are rather a set of predefined ideas. At this stage all the authors made interpretations and discussions included search for alternative understandings and interpretations. Finally, the different themes were exported from the software tool in order to have an overview. This overview constituted the basis for the written text presented in this article.

In the analysis of the interviews we chose to group the roles of the informants in four categories:

1. **Scrum manager role –** Three informants had the *Scrum Masters role*, which are responsible for the project management of the Scrum team or the *Product Owner role*, which is responsible of specifying what is needed in the software from the customers' viewpoint and prioritize these needs as described by Schwaber and Beedle [22].
2. **Team member role –** Nine informants were working in one team and being responsible for delivering the outcome of the sprint as described by Schwaber and Beedle [22]. Their main activities were to design, develop and test the user interface.
3. **Usability specialist role** – Five informants had extensive knowledge of HCI. Typically, they were not members of one particular development team, but supported many teams. Their main job tasks were requirements analysis, interaction design and evaluation. They contribute to the project both during pre-studies and support the team members during the actual development. This role description is based on the Usability Engineer role as described by Mayhew [23].
4. **Business specialist role –** the main job task of four informants was to analyse the requirements of the software during pre-studies. Typically, they were not members of one particular development team, because their main job task was done in the process of forming the teams. Typically these informants did not have as extensive knowledge of HCI as the usability specialists.

4 Results

Here the results will be presented according to the four focus areas in the paper.

4.1 Responsibility for the User Perspective

During the interview sessions all informants were asked about their opinion on who is responsible for the usability of the system or product. All informants gave one single

[1] For further information see `http://www.atlasti.com/`

answer to the question. Some of the informants see responsibility as pointing out the person to blame when things go wrong, whereas others answer from the perspective of who has the duty to deal with usability activities. One of the usability specialist is worried that he might be seen as the one who is to blame since he perceives that the usability of the product they are selling is not really good. He discusses if the others will put the blame on him: *"I do not think that anyone will come and chop my head off - yes actually it worries me a little bit because from a usability perspective it is my product - I am the only usability expert here, so if it lacks the usability it is my fault."*

It is noticeable that the answers to the questions were quite diverse and distributed between four different ways of looking at the responsibility: Six informants state that the usability specialist was responsible, some state that no one (three informants), the whole team (six informants) and the Scrum managers (six informants), are responsible. One of the three interviewees that described that no one was responsible describes that dismissing usability work and the responsibility for the product to be usable was a deliberate choice in the Scrum project due to time pressure: *"Actually no one is responsible. I tried to take that role and tried to integrate it in those parts that I was responsible for. But it was the first thing that disappeared when time became short. You won't have the time to do this. You have to program!"*

Some results indicate that the responsibility for usability is not well defined in Scrum in practice, and that "diffusion of responsibility" and "someone else's problem" has occurred in some of the teams. One informant sums up the situation like this after having thought about the responsibility: "*I don't know who was responsible, that's the answer"*. Another informant describes the lack of responsibility as a problem: *"There is no one responsible for the actual full user experience. That's the problem."*

Table 1. Overview of answers to the question: Who is responsible for the product to be usable??

Answer / Answers from:	The Scrum managers are responsible	The whole team is responsible	The usability specialist is responsible	No one is responsible
Scrum managers	3 Scrum managers			
Team members	2 team members	3 team members	1 team member	3 team members
Usability spec*		1 usability spec*	4 usability spec*	
Business spec*	1 business spec*	2 business spec*	1 business spec*	
Total number	6 informants	6 informants	6 informants	3 informants

* spec = specialist.

One interesting finding is that four out of five of the usability specialists perceived that the responsibility for usability was theirs in their capacity as usability specialists, and at the same time all the Scrum managers perceived that the usability of the product was the Scrum manager's responsibility. This variety of answers might come as a

result from the two different views of responsibility as either something you have the duty to deal with (as a usability specialist you are to deal with usability), and the overall responsibility for the quality of the product from a usability perspective (some might say that the quality of the final product is the manager's responsibility). One of the Scrum managers integrates both views of responsibility in his answer, and he describes that he is responsible or to blame for the usability of the final product, but that it is every ones responsibility to work with usability in the project: "*I of course know that I have the implicit responsibility due to the title I have and the things that I do in the project, people in the project certainly rely on me on making this product highly usable, but I can certainly see that everyone is working towards that goal"*. These two views of responsibility are also present in the answers from two of the usability specialists who have said that they are responsible themselves, but also that the Product Owner is responsible in some way.

Furthermore, six of the informants perceive that the responsibility was theirs as a member of a team. This sums up to be 13 out of 21 informants who feel that they are responsible for usability in their role. This result is really interesting as the informants who took part in the interview study were chosen based on the fact that they worked with usability in Scrum, and even so 8 out of 21 answered that they were not responsible for usability from any perspective. Another interesting finding is that the team members all give different answers to the question of who is responsible for usability, and that their answers are distributed in different categories in Table 1. The answers of the business specialists vary in a similar way but none of them thinks that no one is responsible.

4.2 The User Perspective in Documentation

The informants described several different approaches on how to include the user perspective in written text in the Scrum projects. There are mainly four categories of answers in the interviews: 1) there is no text on the user perspective; 2) a broad and vague description of the user perspective is used; 3) a detailed text on the user perspective is written; and 4) the user perspective is defined by a standard.

Some of the informants described that they did not describe the user perspective at all in their software development (category 1), or any kind of usability specifications. The reason given for this is that the user perspective and usability are difficult to state in words. One of the informants expressed that usability is more a general quality and a feeling not possible to define, as in this quotation: *"sometimes it's like this, you have to feel it to know"*. One informant mentions that the usability specialist in their company must check all the functionality before it can be delivered, that is their way of including the user perspective in their development process, but they do not state any requirements for the usability of the product. Hence, no text or documentation is used to ensure the user perspective. Some of the informants explain the lack of the user perspective in Scrum documentation by saying that it would be of no use in the Scrum context. Documentation used in Scrum generally describes some small aspects of the system, and these generally do not describe the overall picture which is necessary for user perspective. There are generally no such overarching descriptions used

in Scrum, according to the informant. In some companies the introduction of Scrum has changed the process of handling the user perspective and documentation generally, which he sees as very positive, and *"now it feels like we don't seem to do any specifications any more. It is so much more dynamic since they started with Scrum."*

About one third of the informants mention that their companies have written text on the user perspective in the text on non-functional requirements, and generally these requirements are not very strictly defined (category 2). The functional requirements, on the other hand, are strictly defined with levels of importance for the implementation. Some of the levels described were: *"must, if there is time, and if we have time, maybe we will do it"* but these are not applied for defining usability requirements. One informant describes how the user perspective often becomes very vague by explaining how it is included in workshops with users: *"It is very much up to the team in the workshops trying to define what is the soft parts of the products and it mostly comes like, this old system works like this and we don't like that"*. Some companies describe the user perspective in a document depicting a vision for the software system. However, it should be noted that having the user perspective in the vision document means that it is disconnected from the testing and evaluation of the system, as the vision document describes an idea or hope of how the system should work and be in the future. At the same time, including the usability goals in the vision documents helps when viewing the system as a whole which is good as the 'eagle view' of the system is described to be missing in many Scrum projects.

In a few cases there is precise description of the user perspective in documentation used in the projects (category 3). One informant explains: *"You're doing a login page then that login page should be easy and secure, and you have the corresponding measurement for that, what is the users satisfaction as opposed to a scale from one to seven, […] so it's measured in that way"*. An interesting observation is that even though these informants did state a precise description of the user perspective they did not evaluate against these usability goal in a quantitative way later in in the process.

In two companies a standard is used to define the usability of the product (category 4). Both these products are safety critical. One of the informants explains: *"So even in the standards they promote usability to avoid hazards"*. This informant explains further that this was one of the reasons that the company wanted to hire a usability specialist. Another informant says that at his company, general usability goals are stated with references to standard. He explains: "*the general requirements can be the same for different projects and will be referred to in a general document covering all aspects of it, for example a style guide that contains references to standards"*. It is clear that there is not one way of stating the usability goals in practice, and that the challenges for the usability professionals are numerous.

4.3 Activities with Users

It is described in the interviews that the fundamental value in Scrum is speed, and this affects the way that the IT professionals choose techniques to incorporate the user perspective in the development. Our results show that the Scrum team communicates with a few users in an informal way. Often some prototypes are showed and

discussed, or features are presented at a workshop. Prototypes are often showed both to the other team members and to the users. These meetings can be planned in advances, but often they occur when there is a need. Often they are qualitative and the focus is on feedback rather than on quantitative measures.

From a usability perspective it is interesting to look at the user stories since they could be closely related to usability activities and the user perspective in Scrum. A user story is a short text describing the user's interaction with the computer system and it is often used as a way to understand functionality. However, the user stories used by the informants in the study are seldom connected to other usability activities, such as for example interviews with users or field studies and they are often quite technical. One informant describes this as worrisome since the user stories do not help the developers understand the needs of the users. This informant is convinced that there is a need to make other kinds of user stories in the Scrum projects that he works in, and he suggests user scenarios as an avenue forward. Another problematic thing with the user stories mentioned is that the main objective with them is that they define what the different team members are supposed to do during the next day or days. Hence, they are used more for task lists, or to-do description in the projects and they are not really used as a way to understand the users', the users' needs or the user's perspectives. The user stories are more used as a description of who is doing what in the project, and informants use them as a way of remembering and talking about what they are doing in the project. One informant describes how user stories are used in the work of the IT professionals in this way: "they know which story is on-going, and who is working on it, and they have a day-to-day conversation." So the user stories are used to structure the tasks of each team member and for communication of how much is done in the development, and not for describing the user perspective of using the software.

Several of the senior usability specialists describe that they ask the developers what they need when they design the system. Here, the communication of the user perspective is in focus. Then the senior usability specialist gives the developers what they describe they need, and this can be Power Point presentations, documentations, UML diagrams or paper prototypes. One informant describes that: *"I usually try to have a discussion with the developers and ask them what they need to be able to do their job. If they need written requirements, I write it, if they need power point slides with descriptions I do that"*. Hence the communication as such is most important for extending the teams' understanding and motivation for incorporating the user perspective. This way of working also describes that when describing and presenting the users' needs in Scrum, the thoroughness of the information is not as important as providing artefacts to foster communication. When choosing the activities the informants do not talk about which activity would give them the best understanding, or the most correct representation of the user perspective. Instead communication is the core value that informs their choice. The informants also describe that paper prototypes are used in communication with users, and they are chosen as they are quick and easy. Often the feedback given is short and not documented.

One emerging activity with the purpose of including the user perspective in the Scrum projects is the use of user forums or blogs. One of the companies has a blog

where they present and discuss their product. This blog has attracted around 500 users of the system who discuss, complain and describe areas of improvement of the product. The usability specialist working in the company describes these forums that emerge in connection to their blogs as a new usability activity that he has chosen to include in his projects as it is a quick and easy way to discuss with users and to understand the users' perspective.

4.4 Organisational and Contextual Settings for the Usability Work

When asked about the organisational and contextual setting for the usability work, and the foundations for the level of emphasis on the user perspective in their projects, we got interesting answers from our informants describing what is important to incorporate a usability perspective in the organisation. Some mention that the development company has to be interested in including the user perspective in the development work, other mention that the managers and the Product Owners' view on the user perspective is crucial and some mention that both the development organisation and the client need to be interested in these aspects. These various views on what is important in the organisational and contextual setting are elaborated below.

Some informants stress the importance of having a usability knowledgeable person in each team who can teach the other team members how to include the user perspective in the development work. One informant describes: *"I think that by having me on the team everyone was constantly reminded of the need for things to be easier and usability. I think that's one of the big advantages of working in a team. You educate the people you work with and you change their attitudes"*. It is also a general pattern in the interviews that informants who work with usability as team members are more satisfied with their work situation. They have the possibility to affect the work in the teams, and the others often accept and appreciate their contribution. The informants who are outside the teams, in a specialist role focused on usability, are more dissatisfied. They are working as consultants for several teams, and they do often not have the status or power to make a true contribution in the development. One of the informants describes his situation: *"I am like an add on"*. It is noticeable that these informants do not have a formal role according to Scrum.

Others explain that the managers in the development company affect the emphasis on the users perspective vastly, their background and education plays an important role for the focus on usability. One informant says: *"There's a huge focus on usability in the entire organization, thanks to things that have happened. One is that we changed our management to someone who's not an economical person but someone who has an industrial designer background. He's kind of changing the focus to take care of the brand and rather than looking at the economic figures each month they look at the long term prospects for the products that we create"*. Another informant describes that the managers in the company emphasise the user perspective because they presume that they will earn money from it. He describes: *"The company has noticed that it makes money. I think that's the main force. When I started three years ago I tried to push for it as well. But they felt that it was a nice thing to have, but it wasn't crucial for sales. They see it as, in our field it has been low prioritized and*

they saw an opportunity there to enhance this focus. We can be market leading within our field. So I think they understand that they can make money of it". Even though a few informants describe the management's view of usability as important the majority of the informants did not mention the management when asked about the organisational and contextual setting of usability. This might be due to the fact that there had been a change in management in the organisations who mention this. It is interesting however that the informants who have a manager who is really interested in usability perceive that this strongly affects their work and the usability perspective in the organisation.

Others describe that the Product Owner plays an important role when deciding how much the user perspective should be emphasised. Formally the Product Owner should be responsible for the contact with the customer, but the customer does not need to be the user. One informant describes the different stakeholders' aspects by saying: "*I think that it's really important that the Product Owner has the usability perspective, because no one else at that kind of level has those glasses on. The sales director doesn't, and not the marketing director and not the management either really. So the Product Owner is really concerned about the product and how that will be perceived by the customer and the Product Owner is the one that has the most interaction and contact with the team"*. This informant describes that the communication between the management level and the team regarding usability is important, and that it is the responsibility of the Product Owner. It is however noticeable that this informant presumes that the CEO and the managers generally do not focus on usability, and therefore the Product Owner should have this focus. Another informant describes his experience of co-operating with a Product Owner that did not have a usability focus, and how this affects the usability work in a negative way. This informant describes the qualities of a good Product Owner focusing on usability like this: *"I would prefer another Product Owner, who understands the organization, that understands the task, understands really what the users like and what they need. This person was very good at making decisions, but maybe not from the user's point-of-view."*

Some mentioned that both the client and the development team needed to be interested in the user perspective. In some cases the client has asked for courses to extend their knowledge about usability activities. One informant describes that the client probably learned about the importance of usability the hard way. This informant explains: *"I was asked yesterday to have a lecture to the client on how we do work with usability, and how that can affect their role in ordering IT-systems on a regular basis, so they do have an interest in it and understanding for its importance, and I think they've learned this the hard way as many others have that they've ordered quite a few systems, and they're not satisfied with it"*. Another informant explains the importance of the co-operation between the client and the development team when keeping the user perspective in the development. He describes: *"It's probably because the clients have been interested in usability in combination with that we have been able to convince them that this is a good way of working. I guess it's a combination of both. I mean obviously as a usability consultant you know how you think it should be done. Luckily we have been given quite a lot of freedom in how to do it."* This view of the user perspective as a part of both the client and the development organisation's

priorities is a central part of user centred design, and it is interesting to note that very few informants describe this idea in their interviews. It is also interesting to note that the informants with a long education in usability are the ones that mention this perspective in their interviews.

5 Discussion

In this section the different results are interpreted in order to understand the four areas of the article better.

5.1 Responsibility for the User's Perspective

From our previous studies we have seen very different results on who actually shoulder the responsibility, and also different opinions on who should have the responsibility for usability [24]. This study indicates that responsibility for usability is a problematic area also in Scrum projects in practice. The concept of responsibility is not discussed or expressed in the actual projects. However, Scrum projects are probably not worse than other projects regarding the responsibility for usability. Scrum emphasizes productivity and speed in the development projects above other quality features of the system such as usability. Furthermore, there is often no formal role that is given the responsibility for usability in Scrum projects, and this may be a problem as it has a tendency to become "no one's responsibility". However, one may wonder to what extent formal usability responsibility really would affect people in their daily development work and hence influence the quality of the final product.

How can we influence people in Scrum projects to accept responsibility for usability and to work with usability issues? Is it simply to express this need as an activity in the process and then allocate a certain resource to be in charge? Other researchers have answered 'No', since the problem then emerges that responsibility for usability is assigned to someone who does not have the proper knowledge to be able to do a good job [25]. We believe that people must have the right attitude towards usability, a motivation that they really would like to work with usability and an understanding of the role that the user perspective can play in the project if considered properly. Extensive knowledge about, and experience of usability work is also crucial for the responsibility, which is obvious from the study since the vast majority of those who have formal and thorough education believe that they are responsible for usability. People also need to have the skill to be able to shoulder the responsibility for usability, and to work with usability in complex settings. They need to be able to argue and to have the ability to persuade others that usability is important. Hence, we need to prepare them for this during their university education [26].

In this study some of the informants are prepared to shoulder the responsibility for usability, but in the end they are not given the space, mandate or resources to seriously deliver a usable product. This often means that they also need to abandon the responsibility for the user perspective. When you have the mandate and resources to be in charge of usability the possibility to deliver this quality is much more evident

and subsequently the likelihood of delivering a successful project from a usability perspective is there.

5.2 Emphasis on the User Perspective in Documentation

The vast majority of respondents do not use precise or written descriptions of the user perspective in their projects. This is interesting since one way to look at maturity in the development process is to consider the teams' use of quantitative goals of usability [27]. These goals should then be used as a target for usability in all usability activities in development and measured continuously to check if these goals have been reached. However, from this study we can see that in the few cases where quantitative usability requirements or goals were used these were not measured in a quantitative way. The goals often got lost in the process, even if they were written at the start of the project.

Scrum is often presented as a dynamic development process in literature [5; 28]. It focuses on oral communication and on collaboration and it does not stress the need for documentation of any kind [29]. Instead it promotes the delivery of functioning programs and program code. In this context it should be noted that addressing the user perspective according to the principles of user centred design and the ISO standard [30] generally means gathering extensive data and documenting your studies to support design decisions in the project. Hence, this fundamental idea of documenting user data to support design is conflicting with the general idea of Scrum, which might give an answer to why the written documentation is often lacking. Moreover, our study shows that the documented goals for usability in Scrum, are often very general, short and mostly based on an oral common understanding. This becomes problematic as it is generally hard to evaluate those goals, and moreover it is not the same person that establishes the usability goals and subsequently evaluates them.

Another interesting finding is that the few organisations that write detailed usability goals do not use those goals when evaluating the product that they deliver. Even though these goals are precise, measurable and a part of the requirements they are not a natural part of the evaluation phase. These detailed usability goals are sometimes used in the design process to inform design. The activity of writing the detailed goals is hence used to inform design, but not to form the evaluation. Evaluations in Scrum projects are made to get informal feedback, to gather the users' opinion about the software, to find bugs and to check functionality [11]. Often the goal with the evaluation and testing is to check if the user stories are sufficiently developed, and not to check if the usability goals have been fulfilled. One of our informants expresses his view on usability goals by saying: "*As soon as something qualitative is written in the usability requirements, they get lost*". So he thinks that the goals are forgotten, after they have been written, and not used while designing and evaluating the user stories.

Another issue that affects the difficulty encountered when integrating usability in Scrum is the focus on things to be done, i.e. delivery of functionality, and an approach where the system to be built is documented in short descriptions, often in user stories. These small descriptions are not really well suited for usability work generally, as it is really difficult to describe general usability aspects of a system in such a way. It is

very difficult to describe when something is usable, and especially from the perspective of a small piece of functionality. Usability needs to be addressed on a higher level than possible due to the granularity of the user stories in Scrum, and it includes many aspects that are simply impossible to address when the system is presented as small pieces of a puzzle constituting the system to be built.

5.3 The User's Perspective through Activities with Users

It is clear from the interviews that the values underpinning the choice of usability activities are speed and appropriateness for communication. Perhaps this focus on communication really affects the work with usability, and that talking about the system, its users and different problems relating to the system is really one way to incorporate the user perspective that is not a formal activity. The focus on communication makes it easier to work with more fuzzy quality aspects that are not easily defined in documentation. Oral communication often gives a richer picture and supports the user perspective in that sense. Another aspect when choosing usability activities is that Scrum puts a lot of emphasis on producing new parts of the software through using user stories, and not on redesigning older ones. The value in Scrum seems to be a very action oriented culture with a focus on producing new functionality and not so much on evaluating existing software and redesigning to make the software more usable. Two of the informants describe that they have worked around this in Scrum through rewriting the usability problems into new user stories.

Many researchers seem to envision mature system development projects with documentation regarding the user's perspective, an explicit focus on usability, well defined roles and responsibility with a usability focus [31]. According to this way of thinking the system development projects with oral communication, none existing formal roles and a focus on functionality instead of usability are less mature. This would imply that Scrum would be a less mature process from a usability perspective than its predecessors. However, we would argue that the words mature or immature are quite inappropriate to use, as there is no one best way of organising work in software development projects. Instead the activities need to be carefully chosen and managed given a specific context, as is described by for example Contingency theory and in the work by Morgan [32]. Researchers in organisational theory have discussed the appropriateness of organisational structures in a given context, and we concur with them that the choice of activities is dependent upon the internal and external situation.

Workshops are very commonly used in the Scrum projects [13], and it is especially common in the pre-study phase or in the very beginning of the project. Mostly they are used in order to understand the context of use and to understand the users' needs. However, the workshops are not explicitly connected to usability work in the projects, but are more seen as a way to "capture requirements". This is interesting, as it is obvious that these workshops are one way to incorporate the user perspective or users in Scrum. Hence the workshop as an activity can be seen as a Trojan horse hiding the usability activities in a more popular or attractive form, which could be one avenue forward to include the user perspective through activities with users.

5.4 Organisational and Contextual Settings for Usability Work

This study indicates that experienced and knowledgeable IT professionals may be frustrated about the lack of usability considerations in the agile processes. These professionals constantly strive to work with usability according to books and articles published in the subject [33], however they often feel that they fail miserably. The context of their project often makes it hard to successfully integrate the values and principles of user centred design, as discussed by for example [34]. Moreover, they often feel that the guidelines and methods presented by the research community are not supporting them in their work [35]. Hence, we need to reconsider how to present usability activities so that they are perceived as useful by practitioners.

Experienced usability professionals in the study sometimes find ways around these problem and they dress activities that relate to the user perspective in different clothing. Subsequently usability activities enter the Scrum projects as 'Trojan Horses'. In the interviews it is for example apparent that usability activities are integrated into the Scrum projects in the shape of workshops or informal feedback. This way of integrating usability is also described in other research, by for example [36].

In theory, Scrum contains possibilities for an enhanced user perspective through workshops, meetings with users and user stories. However, a clear usability perspective is needed from the project management as well as the organisational context for successful integration of the user perspective in Scrum.

6 Conclusions

To conclude, and as a take-away message, we would like to present a few recommendations for working with user-centred design in Scrum based projects. These are based on the results of our interviews, and also in relation to our previous studies, in line with the discussion above.

1. **There is no clear picture of the responsibility for usability** – Clearly the emphasis on the user perspective should be strengthened if the responsibility for working with usability is clarified and communicated explicitly. This includes both the aspect of who will work with usability, and who is responsible for the quality of the final product. The question is how it could be done in the context of Scrum, where there are no formal responsibilities for any quality aspects, such as security, privacy and performance. Stating that the responsibility for usability should be shouldered by the entire team does not clearly enough distinguish how the user perspective should be integrated to promote good usability. Perhaps this responsibility could be made more explicit using ideas from for example the concept "privacy by design" where it is still a shared responsibility but more explicitly addressed [38]. Moreover, usability specialists shouldering the responsibility for usability needs contextual and organisational support to be able to make a difference regarding usability. Some examples of organisational support needed are: sufficient mandate, support from management, organisational competence,

self-esteem and experience as well as a good position in the team to be able to contribute to better usability.

2. **Usability goals are unclear** – The question is to what extent clear, measurable quantitative goals are needed to focus development efforts and to drive the development of the product quality. Here we believe that more investigations are needed to find examples where high quality products have been delivered without explicit targets being set. Overall quality goals often serve the purpose better than usability goals, as they help deliver the overall design direction.
3. **The ad hoc nature of user involvement and design feedback –** Agile processes do maybe not support, but also not prevent user involvement. Rather the processes involve users informally. Often this is done by gathering feedback on design in an informal way. Most often this is made in an ad hoc manner and based on the team members' own initiative and knowledge about the user perspective rather than being systematically planned in the Scrum process. We believe that it would be beneficial if the process could be systematised, showing user involvement and design feedback as general activities in the development process.
4. **New methods arise –** The agile requirements on speed and efficiency, focusing on deliverables over extensive documentation and the existing criticism based on lack of user involvement gives incentives to develop new usability methods. The development of user forums to discuss and provide immediate feedback to the developing organization happens because of the goal of agile methods of delivering functioning code as fast as possible. Perhaps incorporating the user perspective more deliberately in the sprint review meetings could be one way, or a new activity checking how the users would use the software in reality, a sort of a "reality check" could be another option.

The user perspective may be considered in Scrum projects, if the team wishes, but there is no explicit support or demands for this in the process, unless the project owner or the development manager has a special interest in usability. Since there is no explicit support for the user perspective in the process itself, much of these aspects often exist through informal communication. A user-centred Scrum project needs to find ways of working with the user perspective within the overall agile nature of the project. Activities addressing the user perspective need to be efficient, with a low degree of overhead and formatively contributing to the product towards the final delivery. To sum up: There are changes that should be made in Scrum projects to better integrate the user perspective, since the user perspective in Scrum is existing but not explicit.

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