



# User and Client Satisfaction in Agile Development

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**Abstract:** The emphasis on User Centred Design (UCD) in agile systems development processes (Agile) has been studied from various perspectives. The context of Agile strongly affects the possibilities for IT professionals to conduct user-centred activities in their work. In this paper, we describe a survey study comparing the responses from professionals using Agile processes and other software development processes. Specifically, we explore the values and perspectives that professionals emphasise in their work, whether feedback is gathered from stakeholders, and how frequently feedback is gathered. The main results show that both user and client satisfaction is emphasised by professionals using Agile, but for professionals using other processes such as their home-grown process or the traditional waterfall approach, the focus is user satisfaction. The survey involved a relatively small number of participants (N=42), and thus can be seen as an exploratory work that can inform our future work.

## 1 Introduction

According to ISO/IEC 12207: 2008 [10], the goal of software development is to develop a set of computer programs (software), procedures and associated documentation and data. During software development, there are various phases, starting from the acquisition of the software, to the supply, development, operation, maintenance, and disposal of the software. Depending on the type and scale of a project (e.g., in-house vs. external organization order; short-term vs. long-term; local vs. global market), which in turn influences the choice of software development process and methods, different stakeholders can be involved. They include project manager, client, customer, software analyst, software developer, interface designer, usability and user experience specialist, and, presumably the most important among all, **end-user**. This list as well as the characteristics (e.g., role, expertise) of individual stakeholders can further be refined contingent on a project's profile. The

emphasis on fulfilling the needs of the different stakeholders varies with the software development process used.

Agile software development processes (Agile), such as Scrum, Extreme Programming (XP) and Dynamic Systems Development Method (DSDM), have become a *de facto* standard for software development practice. Lean software development, which is part of the Agile category, has recently gained popularity, with the Kanban processes being the most popular one [11]. Agile focuses on delivering functioning software early and continuously. Agile values speed, communication and collaboration in software development. In the Agile Manifesto, customer collaboration is one of the four core values and the first principle is described as “*our highest priority is to satisfy the customer through early and continuous delivery of valuable software*”, so customer satisfaction is strongly recommended [2]. In ISO/IEC 12207: 2008 [10], definitions of different stakeholders involved in software development, including customer, are given. Accordingly, customer is defined as: “*organization or person that receives a product or service* and a user is defined as: *individual or group that benefits from a system during its utilization*“.

In accordance with ISO 9241-210: 2010 [9], the User Centred Design (UCD) framework involves several key approaches: user-centred systems design methods, rapid contextual design, and user involvement. In UCD, we address different aspects of user experience (UX) and usability of software with user satisfaction being a major focus. In ISO 9241-210: 2010 [9], a user is defined as “*a person who interacts with the product*”. Examples of UCD activities include creating personas to communicate user research, doing field studies that observe users, and usability evaluations for gathering user feedback.

The recent wide adoption of Agile processes can be explained by the implicit assumptions that they address user perspectives better than traditional software processes [1] and that by simply applying an Agile development process the software system can become more usable for end-users than otherwise. However, previous research has shown that this is not always the case, and that the context of Scrum impacts user involvement as described in, for example [4] and [12]. Many research projects aim to analyse and understand the conditions under which Agile and UCD may work together. Some studies are based on empirical data (e.g., [8], [14]), but some are rather analytical, expressing opinions based on certain ideas and assumptions, which are thus more open to debate.

Another intriguing topic is the integration of UCD within Agile. Chamberlain and colleagues [5] conducted a field study to investigate the

integration of UCD into Agile. They concluded that successful integration requires *balancing* between each of the disciplines in the team and that sufficient resources for the work need to be provided. Additionally, it requires that all key members must be involved in key decision points in the project and that users play an important part in the project. Blomkvist [3] claimed that Agile processes do not inherently provide the required support for including user perspectives in development. As an example, iterative development is fundamental to both UCD and Agile, but their views on as well as definition of the term “*iterative*” are substantially different [3].

Nevertheless, the basic values and specific methods of Agile may have the potential to work well together with UCD. Ferreira and colleagues [8] conducted an observational study of a mature Scrum team in a large organization, and their interactions with the UX designers working on the same project. They concluded that the cooperation between Agile developers and UX designers was achieved through on-going *articulation work* by the developers, who were compelled to engage a culturally distinct UX design division. Constantine ([6], [7]) reworked his Usage-centered design methodology to become more lightweight. He claimed that his model-based approach focused on usability and user interface design, and even more so when it was turned into an Agile version of the same overall methodology. McInerney and Maurer [13] interviewed three usability specialists in Agile projects. They were all very positive over their ability to manage usability and UX activities in the Agile projects, and although they could not prove any positive effects in the resulting projects, they were positive about their ability to contribute, and did not identify any negative effects resulting from the adoption of the Agile approach in the projects [13].

In this paper, we address three particular questions to explore if there are any differences in attitude and practice between software development professionals who use agile processes and those who use other processes:

- a) What do professionals state as the main emphasis or values when developing software?
- b) Do they gather feedback from various stakeholders?
- c) If they gather feedback, how frequently is that done?

## 2 Method

In this section we describe the method and procedure of the study, the participants in the survey, the processes they used for software development and their main job role.

## 2.1 Method and Procedure

The survey consisted of 48 questions, 40 close-ended and 8 open-ended. The first part of the survey collected information regarding the participants' background, work environment and experience. The second part contained 4 questions regarding the participants' use of software development processes and their preferences. The third part contained a combination of 14 open-ended and close-ended questions to gather their understanding of the terms 'user', 'customer' and 'client' and to describe the people belonging to these three groups in their development project. Additionally, the participants were asked to describe their main emphasis when developing software. Finally, they were asked to respond to the questions about gathering feedback on design artefacts from stakeholders, including users, customers, clients, and colleagues. In this paper, we focus on the analysis of the participants' responses to the questions on the main emphasis and gathering feedback from stakeholders.

## 2.2 Participants

The survey was web-based and distributed via email to 393 graduates from Computer Science of Reykjavik University in Iceland that all had successfully completed at least a B.Sc. program there and their graduation year was between 2009 and 2014. Out of these graduates, 73 responded to some questions in the survey (i.e. the response rate of 18.6%). To the questions analysed in this paper, 42 responded (i.e. the response rate of 10.7%), the gender distribution was 74% male, 12% female and 14% did not respond to that question. This response rate was rather low, but the study could be seen as a pilot study for future work in the area.

All of the 42 participants received the more or less the same training in computer science and all of them completed a course in Human-Computer Interaction (HCI) as a compulsory part of their education. Of the respondents, 86% completed a B.Sc. degree, 14% completed a M.Sc., or a Ph.D. degree. Their industrial experience varied, 36% had been working for less than a year, 40% for 1 – 3 years and 24% for more than a year. The largest group of the participants (57%), at the time the survey was administered, worked in a company that had less than 50 employees, 17% at a company with 51 to 200 employees and 26% with over 200 employees.

Concerning the types of software developed in the participants' companies, the sector "Business/Finance" and "Data Management" were the most common (26% each), followed by games (14%), communication software (7%) and other categories (27%), including management and monitoring

software, web development software, specialised software and research software.

### 2.3 Development process

The most frequently used software development process was Scrum with 40% using that process only and 14% using both Scrum and Kanban. Another 12% were using only Kanban and 10% were using Agile processes other than Kanban or Scrum. In total 76% of the participants were using Agile processes (N=32) and 24% using processes other than Agile (N=10), including 19% using their own process and the others using the waterfall process or no process. The results in the paper have been derived from the analysis of two groups of participants: those using Agile (N=32) and those using other processes (N=10).

### 2.4 Main Job Role

The participants were asked what their main job role in the last three months was; the following options were given and more than one could be chosen: a) requirement analysis, b) design, c) programming, d) testing, and e) other activities (such as project management, teaching and researching, consulting, etc.). About 83% of the participants selected programming as their main task in their workplace. Other options included design (53%, the second highest), requirement analysis (~31%) and software testing (~31%).

Table 1. Number of main job roles of the participants.

Main job role	Agile (N=32)		Other (N=10)	
	One	6	19%	1
Two	8	25%	3	30%
Three	10	31%	3	30%
Four	5	16%	2	20%
Five	3	9%	1	10%

As shown in Table 1, around half of the participants using Agile development had 3 to 5 main job roles and about 60% of the participant using other processes. This suggests that each software developer needs to have various competences for developing software, at least in the software industry in Iceland.

### 3 Results

In this section, we structure the results according to the three research questions:

- a) What do professionals state as the main emphasis or values when developing software?
- b) Do they gather feedback from various stakeholders?
- c) If they gather feedback, how frequently is that done?

#### 3.1 Placing Emphasis

The participants were asked: “*Where do you place the most emphasis in the projects you are working on now?*”

Table 2. The main emphasis in the software projects

Emphasis	Agile (N=32)		Other (N=10)	
Client satisfaction	11	34%	0	0%
User satisfaction	10	31%	5	50%
Customer satisfaction	2	6%	0	0%
User and client satisfaction	1	3%	0	0%
Saving development time and/or cost	1	3%	2	20%
Safety	0	0%	2	20%
Hard to specify	2	6%	0	0%
Other	5	16%	1	10%

As shown by the results presented in Table 2, those participants using Agile most frequently put emphasis on client satisfaction but user satisfaction was similarly emphasised, and one participant stated that he emphasised both user and client satisfaction. It is interesting to note that none of the participants using other processes mentioned client satisfaction, but half of them mentioned user satisfaction as their main emphasis.

#### 3.2 Gathering Feedback

The participants were asked if they gathered feedback from users, clients, customers and colleagues or friends. The motivation for asking was to check if they were using a user-centred approach to software development, and if they also consulted other stakeholders for getting feedback on their software. The results are shown in Table 3. In the survey, there was an explanation of what gathering feedback means.

Table 3. Gathering feedback from stakeholders

Gathering feedback from:	Agile (N=32)		Other (N=10)	
	Users	23	72%	6
Clients	14	44%	3	30%
Customers	9	28%	4	40%
Colleagues and friends	22	69%	6	60%

As shown in Table 3, 72% of the participants using Agile gathered feedback from users and 69% from colleagues and friends. Sixty percent of participants using other processes than Agile gathered feedback from users and there were also 60% that gathered feedback from colleagues and friends. Not as many gathered feedback from clients and customers.

The participants were also asked about the definition of the terms. Around 40% of the participants using Agile processes thought that the term client was the same as the term customer, about 20% thought the term user was the same as the term customer, and similarly about 20% thought that the term user was the same as the term client. For the participants using processes other than Agile, 80% thought that the term client was the same as the term customer, 30% thought that the term user was the same as the term customer and similarly 30% thought that the term user was the same as the term client. It is interesting to note that the term customer clearly has different meanings in these two groups of participants.

### 3.3 Frequency of Feedback

The third issue we analyse in the paper is the question about how often the participants gather feedback from various stakeholders, including users, customers, clients, colleagues and friends.

Table 4. Frequency of gathering feedback from stakeholders

Gather feedback from:	Agile (N=32)				Other (N=10)			
	Once a week	1 - 3 times a month	2 - 4 times a year	Never or missing	Once a week	1 - 3 times a month	2 - 4 times a year	Never or missing
Users	7	9	5	11	3	1	1	5
	22%	28%	16%	34%	30%	10%	10%	50%

Clients	4	6	3	19	1	1	1	7
	13%	19%	9%	59%	10%	10%	10%	70%
Customers	4	2	3	23	3	0	0	7
	13%	6%	9%	72%	30%	0%	0%	70%
Colleagues and friends	16	5	1	10	3	1	2	4
	50%	16%	3%	31%	30%	10%	20%	40%

As shown in Table 4, the participants using Agile most frequently consulted colleagues or friends; 50% of them consulted users at least once a month, but only 20% of them consulted customers, despite the emphasis in Agile on doing so. The participants using other processes, the difference was not so clear, but there were only ten of them. In responding to the question what method was most useful for gathering feedback, the most frequently method used for gathering feedback from all stakeholders was meeting.

## 4 Implications

Based on the results above, we pose these questions that could be further discussed at the workshop:

- In Agile processes the focus seems to be both on the client and on the user, whereas in other software development processes the focus seems to be more on the user. Does this difference depend on the way the question has been asked?
- It seems clear from this survey that most systems developers have many different roles in systems development. This has implications for our computer science education and we need to prepare students for this kind of work. Do we prepare the students for this in an adequate way?
- Even though client satisfaction is of the top priority, feedback is not often gathered from clients. How can we address this problem?
- Half of the Agile software developers gathered feedback from users at least once a month, and the most useful method mentioned was meeting. Since meeting is the most frequently mentioned method and the most useful one: Should we place more emphasis on teaching how to conduct productive meetings?

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