Turning the Tides

A case study about integrating UX practices within a UX-immature organization

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Abstract

In an era where the customer has the power, creating not only usable but also satisfiable systems and applications is of importance. However, research shows that software development practices do not always allow user experience design to take place and gives little guidance regarding how to conduct and integrate UX work. Despite UX’ increased popularity, gained recognition and prior research efforts, organizations and companies still encounter challenges when trying to embrace this change to offer customers more than just a system that ‘works’. Much recognition has gone to the UX field of late, however organizations that lack knowledge, strategies or personnel can often feel powerless. Therefore, we set out to explore what an in-house IT-department without UX practitioners perceived as challenges when integrating UX work and practices. We conducted interviews with developers and project managers within an IT-department to get their opinions. In our study, we identified factors that seem to play a part when integrating UX – such as communication, UX maturity, prioritization and attitudes. Based on these findings, we visualized these factors in what we call a maturity map.

Keywords: User Experience, User-Centered Design, Agile Development, Software Development

1 Introduction

The digital transformation of our society is happening at a rapid pace. Information technology has had an overwhelming impact not only on how we as citizens live and manage our daily lives, but also on how companies and organizations conduct their businesses to cope and keep up with new kinds of demands (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013). The digitization and automatization of processes to create higher value means that companies and organizations invest a lot of money and effort in development of products, services, and systems.

With the development of portable technology and ubiquitous computing we have also witnessed a shift in how companies need to cater to their users. This is partly due to today’s end-users having higher expectations of the tools and software they are going to use and assist them in their daily life. The shift towards more user-centered systems has its roots in Human-Computer Interaction (HCI). Human-Computer Interaction is defined by Hewett et al. (1992) as:
“[...] a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them.”

Dix, Finlay, Abowd, and Beale (2004) then argue that this entails not only the aforementioned aspects but also covers the user and the context in which the system is used. Users in this case vary from individuals to groups that are partaking in a process or a task, while computing systems can be anything from smartwatches to large-scale computer systems. Looking in the rearview mirror at the history of computers and machines, there has been what is called ‘three waves of HCI’ (Bødker, 2006). Duarte and Baranauskas (2016), with help from Harrison, Tatar, and Sengers (2007), describe the first wave as task-based which focused mostly on practical results and was concerned about solving concrete problems. Interaction was what Harrison, Tatar, and Sengers (2007) called a “man-machine coupling” that put heavy emphasis on ergonomics. The second wave was more concerned about the human mind, the context of use, and how human beings processed information on interfaces. Lastly, the third wave is what we are witnessing today. Computation and connectivity have penetrated our society and people’s everyday lives. New technologies such as augmented reality, artificial intelligence and tangible interfaces have paved the way for new types of elements – such as cultural and emotional experiences.

Consequently, this has led to a change in software development methodologies. Whereas companies and organizations used to subscribe to more rigid waterfall-based development methods, they now mostly rely on more agile methodologies, which offer room for more flexibility. In turn, this affects how systems and applications are being developed today. In 1988, Don Norman coined the term User Experience. He wanted not only to capture the interface and usability of a system or a product, but also aspects that are significant for a person’s experience with any given artefact – such as industrial design, physical interaction, graphics, interfaces and manuals (Norman, 1988). A layman’s description of this can be formulated as a “person’s perceptions and responses resulting from the use and/or anticipated use of a product, system or service.” (Kuusinen, Mikkonen, & Pakarinen, 2012).

Thus, it can be argued that User Experience is a derivative of usability, encompassing a larger area of a user’s view of a product. Usability can be seen as something narrower, which solely focus on goal or task achievement when using a system, application or website. Usability and user experience seem to be dependent on each other in various ways. Tuch, Roth, Hornbæk, Opwis, and Bargas-Avila (2012, p. 1596) describe it as:
“In order to create a good user experience, it is important to understand the relation between aesthetics and usability, as well as the processes underlying this relation.”

UX takes a more holistic approach, augments the subjective and aims for a combination between pragmatic aspects and hedonic aspects. It is worth mentioning that one cannot really design user experience, but one can design for user experience – which is a fundamental difference.

Garrett (2011) says that more and more businesses have come to recognize the value in providing a good user experience that can result in a sustainable competitive advantage. Companies such as Apple¹ have really emphasised this shift. Apple did not invent the mobile phone, yet they have succeeded to capture user’s needs and turn their customers into loyal fans. This is just one example of companies that are delivering user experiences in excellent ways. These companies are full of continuous studying of user behaviours, testing and innovation. Garrett (2011) concludes that in the end it is the user experience in products and services that forms customer impression and differentiates you from your competition.

2 Objective of Research and Research Question

In this paper we set out to develop a deeper understanding of the perceived challenges in adopting a more user-centered software development approach, in an organization that lacks dedicated UX practitioners. A lot of previous research carried out focusing on User Experience, User-Centered Design and Agile Software Development has been about how these can be integrated and common challenges while performing said integration, though generally with the help of UX practitioners.

Findings in this paper will not only provide knowledge for various in-house IT departments, but for any organization that lacks UX practitioners and needs direction and insight on how to become more UX-oriented, by becoming more aware of challenges. In our research we refer to ‘UX practices’ as an umbrella term for User Experience Design, User-Centered Design and User-Centered Design Techniques.

Agile software development and how it combines with UX design have been frequently researched over the past years. However, we can identify a gap in current research in how companies and organizations try to integrate User Experience in agile projects with no in-house UX expertise. Most research mentions dedicated UX teams, either in-house or external consultancy firms and business to consumer organizations. Most of the organizations mentioned in this research also appear to possess higher degrees of UX maturity (Nielsen, 2006).

¹ www.apple.com
This leads us to the topic of our research. The question we set out to answer in this study is:

“What are the challenges in adopting UX practices in the software development process within a UX-immature organization?”

3 Related Research

In this section we present relevant definitions and related research within the field of User Experience and Agile Software Development. Furthermore, our attention has been turned to key terms and concepts that align with our research question.

3.1 Agile Software Development

To understand User Experience there is need to understand the process behind it as well. Software development is a process that aims to create computer coded software to address either personal or business goals. This results in software that ranges anywhere from databases to games. Andén, Burkacky, Comella-Dorda, Gnanasambandam, & Strålin (2016) explain that when technologies reshape and make wave for new competition, any organization’s products or services rely heavily on their software as a differentiator.

Whereas software development used to take place using a traditional step-by-step engineering approach, during the 1990’s a shift could be witnessed in how systems came about. As a reaction towards older ‘waterfall’ based methodologies, that were too slow and extensive in its character, so called agile methodologies started to emerge (Nyman, 2010). The waterfall method, originally credited to Winston Royce in 1970, functioned as the base in software development for a long time and is characterized by a more structured approach that consists of sequential phases, where each step of the process is completed before the next one follows. Just like a stream of water (and progress) running downwards trough the various phases until completion.

Since the waterfall method is not well equipped to handle change, agile methods are meant to adopt to changing requirements. Change is a well-known phenomenon when it comes to software development, and if your project is capable of handling change that can ultimately lead to less development costs while still maintaining quality. Young (2013) says that agile project management is based on doing many incremental releases and iterations in a short amount of time, while waterfall approach would aim towards a single release over a longer period of time.

The word ‘agile’ itself literally means to move quickly and easily. Agile is far from a system development methodology itself, but specifies certain principles, values and attitudes. As a reaction to waterfall-based methodologies, agile is more capable of handling change because of its dynamic rather than static nature (McCormick, 2012). As a reaction to technology’s dynamic
nature, the Agile Manifesto was created by seventeen proclaimers of agile methods (Agile Alliance, 2001) and formed these core values:

- **Individuals and interactions** over processes and tools
- **Working software** over comprehensive documentation
- **Customer collaboration** over contract negotiation
- **Responding to change** over following a plan

### 3.1.1 Factors Affecting Software Development Outcomes

In an extensive survey and compilation of literature by McLeod & MacDonnell (2011), stretching from 1996 to 2006, the authors looked closer into what factors are influencing the outcomes of software development projects. Some of the factors mentioned in the literature include the developer perspective emphasizing interpersonal and communication skills as equally important compared to technical aspects. Communication is perceived to be of importance because of the interaction with users and for facilitating dialogues. This to gain participation and understand different contexts, lay out technical boundaries and listen to user-related problems. Effective and fruitful communication between other stakeholders has long been regarded as important for any software development project as well.

Furthermore, Hornik’s 2003 study (as cited in McLeod & MacDonnell, 2011) show that systems being developed with low level of user satisfaction also were victims of poor communications skills on the developer’s behalf, while Lytinen and Hirschheim (1988) also state that development professionals often neglect differences in how individuals process information and respond to a new system. McLeod & MacDonnell (2011) state that organizational culture plays a major part in system development, and mention that common understanding, interpretations, ideas and values shape not only system developments and implementation, but also provide patterns for behaviour within the same organization.

### 3.2 User Experience

The term ‘User Experience’ has become kind of a buzzword in the world of software development. It is viewed as a somewhat new concept that has its roots in the field of HCI and is grounded in User-Centered Design practices. UX is something that organizations, companies and product owners are trying to push into their products and development of interactive systems. However, even practitioners and experienced people in the field of HCI have a hard time reaching a shared and unified understanding of the accepted – but still ambiguous – term (Law, Roto, Vermeeren, Kort, & Hassenzahl, 2008). The reason for this confusion is the broad concepts that underpin the notion of UX, such as emotions, hedonic qualities and aesthetic variables. UX can have various definitions depending on what field of study you might investigate or what person you may ask.
Treder (2013) explains it as an “end-to-end experience that a user has of a product” while Knemeyer and Svoboda (39. User Experience - UX, n.d.) in a similar fashion state that it is “[...] the quality of experience a person has when interacting with a specific design.”. This quality is furthermore described by Tuch et al. (2012) as how fun a product is to interact with, how aesthetically beautiful it is and the identification a user feels towards it.

Thus, UX is more than just usability. While the latter is more measurable, the former is describing something that is harder to grasp, since it is subjective and lies more in the individual. While the trend has moved away from task-based activities, focusing on the user completing its task, companies and organizations now strive to offer consumers and end-users even more value by raising the quality around their software and products. Preece, Rogers, & Sharp (2002) explain the development within software design with a model that illustrates the shift from usability focused only development to other dimensions such as enjoyment and reward, which was not prioritized to a higher degree until of late.

**Figure 1** Usability and user experience goals. (adapted from (Preece, Rogers, & Sharp, 2002))

In addition to this, Bevan (2009) explains that this shift has led to other kind of concerns during software development. Instead of focusing on task performances, UX emphasizes the pleasure aspect as well. For that reason, it becomes more apparent how to analyze the different concerns that are associated with each term – even though good usability is seen as an essential precondition to good user experience among UX practitioners and researchers (Law, Roto, Vermeeren, Kort, & Hassenzahl, 2008). While usability covers evaluation of qualities like efficiency, effectiveness and utility, User Experience is about designing how people interact with a given artefact, what they do and why. Furthermore, usability is about making a product easy to use, evaluate it and fix usability problems while User Experience is more concerned about
hedonic goals of stimulation, evocation and identification. A visualisation of these traits is presented in Fout! Verwijzingsbron niet gevonden..

### 3.3 User-Centered Design

Where ‘UX’ refers to a set of properties of a released product or system, it does not include the method in which these are created. For a product or service to have ‘good UX’, the user needs to be considered during the development process. A way to do this, is by applying a ‘User-Centered Design’ (UCD) approach, also referred to as ‘Human-Centered Design’. This term was coined by Norman and gained popularity after the release of his staple work ‘The Design of Everyday Things’ (1988; 2013). It aims to put focus on the user’s needs during the entire process of product development, rather than involving the users only at the end of a project.

> “Human-centered design (HCD) is the process of ensuring that people’s needs are met, that the resulting product is understandable and usable, that it accomplishes the desired tasks, and that the experience of use is positive and enjoyable.”
> — Norman (2013)

Benyon (2014) states, just like Norman (2013), that being human-centered, or user-centered, is about putting people and users first. It is a collaborative process where techniques such as personas and scenarios are used to guide the design process. This process consists of specifying contexts and requirements, and then creating design solutions to evaluate in an iterative manner. It involves considering what people want to do, rather than what technology is capable of. It is about involving people in the design process and to support people and for people to enjoy.

Even if UCD is desirable, it can also quickly and easily drain a budget, says Benyon (2014). Businesses thus may ask if it is worthwhile, and to that Benyon (2014) answers with a resounding “yes”. Stakeholders can often be reluctant to incorporate extensive UCD, because of budgets and timeframes. According to McLeod & MacDonnell (2011) the allocation of adequate resources also not only enables project teams to meet milestones, but also allows them to overcome organizational obstacles and contribute to higher developer creativity. Taking a user-centered approach involves talking to and observing people, which leads to greater empathy and recognition of human values. Furthermore, it consists of evaluating prototypes which in the end are more likely to meet expectations. This ultimately leads to higher return on investment, increased safety and privacy aspects among other benefits.

### 3.4 Integrating UX practices

Companies do, according to Nebe & Grötzbach (2006), struggle with the adoption of User-Centered approaches and the techniques involved in their development lifecycle. The authors state that even though there is a clear advantage being recognized by people pulling the strings
and taking decisions, it is often complicated to see how to apply it in practice in an obvious way.

Detweiler (2007) states that there is often not enough time allocated to conduct proper user research or requirement gathering, such as observing and interviewing to truly understand end-users and their context. Although Detweiler (2007) states that there is usually not enough time allocated, prior research does not provide one-size-fits-all procedures telling how much time exactly is needed, and how much a user should be involved (Chamberlain, Sharp, & Maiden, 2006), nor exactly which techniques to deploy or how to measure UX practices.

Other research (Silva da Silva, Selbach Silveira, Maurer, & Hellmann, 2012) has been looking at how Agile development and UX combine in theory because they are both iterative in nature and compatible from that point of view, but in practice they emphasize different aspects in the process. User Experience often involves extensive user research and techniques such as observations and interviews, which often can clash with the agile code creation which aims to have sets of features done for testing, often at a rapid pace. Time and motivation can thus have their differences, and as Rosenberg (2014) points out: meaningful user experience and UX design suffers within the time-boxed sprints that is Agile.

In a study by Kashfi, Nilsson, & Feldt (2017) where the authors looked closer into the implications of integrating UX practices into agile software development they found a couple of challenges of tactical nature as well as a couple of ‘soft’ ones such as views, attitudes and knowledge. Lack of common reference and knowledge, or limited knowledge, often can lead to a language gap which means that the concepts of both UX and its practices can have a different meaning to different people. Furthermore, focus on objectively measurable aspects rather than subjective aspects of software tended to be valued more highly and as Kashfi, Nilsson, & Feldt (2017, p. 16) put it “[…] participants believed that the software community often focuses more on ‘actual’ than ‘perceived’ quality characteristics of software.” The authors conclude by saying that even if companies intend and have the interest to focus and adopt more UX practices, relevant capabilities are conspicuous by their absence.

Furthermore, Hauser (2007) emphasizes the importance of clarification regarding what is expected from the team and its members, and how responsibilities are distributed. Detweiler (2007), Hauser (2007) and Sillén (2014) point out the benefit of letting developers and stakeholders go to the end-users themselves and involve them early on for a better understanding of the situation and observe them in real-time. Hauser (2007) also highlights that UCD very much is a question of mindset among the involved and building meaningful relationships with stakeholders. If everyone that is involved does not share the same goal, people will not work as a team, which is the point of user-centered design.
3.5 Organizational Maturity & User Experience Maturity

Before companies and organizations can really make a convincing case for investing more resources into UX, it is important to first take a seat and assess the current level of UX maturity – that is how willing an organization is to make User Experience and the practices that follow an integral part of the business.

To stay competitive in whatever market an organization or company may position itself in, there is a need for continual self-reflection and improvement. De Bruin et al. (2005) argue that to retain and maintain competitive advantage an organization must identify how to improve quality and cutting existing costs. Maturity models in general could be argued to work as a foundation to recognize this and assist companies and organizations in this strategic matter. User Experience maturity directly involves not only an organization’s ability to handle technology and IT, but also marketing, other organizational processes, product development and finally sales. For an organization to climb any ‘UX ladder’, it is essential that leaders recognize the importance and the value it can potentially bring. To create a holistic view of User Experience and proclaim its usefulness, and incorporate it in the overall strategic plan on an organizational level, rather than as a standalone component on a project level is deemed crucial according to Feijó (2010). Furthermore, it is important that UX becomes a part of your organizational culture (Vetrov, 2013). That is, to create a positive feeling throughout the organization and that UX is merged into the overall business strategy. If it is part of the culture, people will also work towards shared goals and a common understanding as a result, ultimately changing the mindset among employees.

The User Experience Maturity model developed by Feijó (2010) aims to illustrate how much room and prioritization User Experience is given. It is a helpful assistant to determine current state and assess a company and/or an organization’s strategy. Feijó’s model can serve as a roadmap in how to move on and pursue further competencies and capabilities. It consists of six levels, as shown in Figure 2.
Nielsen (2006) has created a maturity model which consist of eight steps. These eight steps are representing current practices and visualize digestible insight in how mature organizations are in incorporating UX practices. In short, these stages consist of:

1. **Hostility Towards Usability**: Users are ignored. The goal is to create applications that work.
2. **Developer-Centered Usability**: Usability has value, but components or projects are not funded. Design decisions are based on personal judgements rather than including end-users.
3. **Skunkworks Usability**: Individuals start to realize the value in UX. Ad hoc and other simple usability efforts often takes place. No allocated human resources.
4. **Dedicated Usability Budget**: Dedicated budgets allocated for usability somewhere in the organization. Usability resources are scattered throughout, and no real organization-wide efforts are in place. Methods includes user testing.
5. **Managed Usability**: UX has set root in an organization. A UX manager is often hired that is in charge for the overall UX across the organization and projects. Usability efforts still reminds of stage 4 to some extent.
6. **Systematic Usability Process**: Organizations have recognized the need for an UCD process early in development, with activities and milestones. Iterative design and user research takes place. No longer is it seen as fairy dust sprinkled over systems and UI’s towards the end.
7. **Integrated User-Centered Design**: Early user research is more prominent. Every project within an organization also has usability goals that has defined metrics, and given product is not released until these are fulfilled.
8. **User-Driven Corporation**: *UX Nirvana*. User research determines strategies and the organizations overall direction. The concept is extended beyond just technological artefacts and penetrates physical areas like lobbies and stores, very much like Apple and Google.
Vetrov (2013) speaks about the maturity within organizations by describing three levels: operational, tactical and strategic. He also mentions the level ‘chaos’, where the lack of UX is profoundly obvious and where the quality at most times is random and often includes just the visual aspect more than anything else. For a UX strategy to take place, the company itself need to reach a certain maturity where User Experience will grow and to successfully implement UX related strategies. Vetrov (2013) speaks about the importance of three core elements to support it: resources (e.g. money, people, time), processes (changing them) and priorities (understanding the value & what path to follow). Feijó (2010), when explaining this maturity model of Vetrov (2013), says that these strategies is a set of coordinated and orchestrated efforts of planned tactics or actions that you launch to help you along the road to a desirable state or destination.

4 Method

*In this section we will step by step go over how research was conducted and how the gathered data was analyzed. We discuss why we did as we did and explain our choice of method in further detail.*

4.1 Case

This study has been conducted using a single case study approach. We investigated the challenges associated with UX practices in an in-house IT-department. Since our case can be argued to only fit in a single unit within a single context (Rowley, 2002), it is also what Yin (2014) would call a holistic case.

The organization described in the case is in the start of a process adopting UX practices within their software development and wanted insights on how to integrate it in a smooth manner. The study has investigated challenges on two levels: both on an individual level and a managerial level.

The Swedish University of Agricultural Sciences (SLU) is a university with a focus on agriculture and forestry. SLU is concerned about topics that lie at the centre of our existence such as food supply, clean water and energy. In this case study however, we are only focusing on SLU’s IT-department. The IT-department is spread out over two locations, Umeå and Uppsala, and they develop custom-made solutions for use within the university or its research projects. The department caters SLU with long term and sustainable data and communication infrastructure. Despite being part of the university, other departments are free to pick an external IT supplier, forcing the IT-department to stay competitive. The IT-department currently houses around one hundred employees which are divided in three units: systems, operations, and IT-support.
The software development method subscribed to by SLU follows the DSDM approach, which is a methodology that is part of the agile development tradition. In this paper we do not specifically consider DSDM, but rather talk about agile development as an umbrella term and do not draw distinctive conclusions based on specific methodologies within the agile tradition.

At the time this research was conducted, SLU’s IT-department did not explicitly put any emphasis on User Experience within their projects, nor did they have any hired any dedicated UX personnel. Project Managers at the IT-department wanted suggestions on how they could integrate more UX into their projects.

By the time of research, seven different projects were identified among our respondents. Developers and Project Managers were also involved in multiple projects at a time. Beside working in different projects, respondents also had dedicated hours for maintenance work with systems that are already up and running.

4.2 Qualitative Method

In this paper we set out to get a deeper understanding of, as mentioned in section 1, what kind of challenges SLU as an organization are facing when trying to adopt UX practices within their system development projects. For us to understand this, we had to speak to team members and representatives from the IT-department in form of Project Managers and Developers to understand the situation. We found that a qualitative approach would provide us with the richest answers and allow us to develop an understanding of the current situation. Bryman (1997) states that in the qualitative approach there is a will to observe events, actions, values and norms from the eyes of the subjects within their own context.

Trost (2005) states that the choice of method should be dependent on potential theoretical frameworks and research questions. Our motive for using a qualitative approach was because we wanted to get an understanding and find potential patterns in our respondent’s experiences and their own specific context. This way of researching the question allowed us to interpret and analyze the material corresponding to our question.

Furthermore, Walsham (2006) also states that interpretive research, also known as qualitative research, has gained much more recognition within the IS (Information System) field of late, while Hassenzahl and Tractinsky (2006) also state that there is a general need for further empirical research regarding User Experience.

4.3 Strengths and Weaknesses

According to Mason (2002) the choice of method should align with a given research question. In this study we aimed to understand underlying challenges and motivations, and therefore we chose qualitative interviews. The reason for that is that we wanted to get insights in our participants’ experiences rather than quantifiable metrics. Bryman (2012) explains how the quantitative approach is concerned with questions starting with ‘how many’ and ‘how much’, and
concentrates on measuring. Mortensen (2018) as well as Strauss and Corbin (1990) state that qualitative approaches such as interviews seek to get a more in-depth understanding of the individual’s experiences, everyday lives, behaviours, emotions and feelings.

Although the qualitative method offers insights that a quantitative study would not, it is essential to also acknowledge its limitations. While a quantitative study is easier to generalize due to its often-larger data set, a qualitative study often concentrates on smaller populations and cannot be applied to wider populations (Atieno, 2009). This means that findings often are limited to a certain context and are not generalizable to a bigger population, as explained in further detail in section 6.2.

4.4 Data Gathering and Sample Size

The objective of this research was to investigate perceived challenges within SLU in adopting user-centered design within their development approach. The data gathering phase for us started early on with an initial meeting with project managers, where we discussed expectations and got a picture of the current state of system development at SLU. Although this data was not analyzed, it still gave us valuable information. We then held continuous weekly meetings during the starting phase to build a relationship and to avoid miscommunications, just like in any real-world agile project.

Our dataset consists of eight respondents (Table 1). Of these eight, six were developers and two were project managers. We did not choose our respondents ourselves, instead they were provided to us by SLU. Three of the respondents were interviewed in person and the remaining five were interviewed over Skype. Respondents were free to choose English or Swedish as interview language. The one non-English interview was translated before coding.

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Role</th>
<th>Gender</th>
<th>Years at SLU</th>
<th>Interview duration</th>
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</tr>
<tr>
<td>R2</td>
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<td>Male</td>
<td>6</td>
<td>49:00</td>
</tr>
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<td>Male</td>
<td>2</td>
<td>48:00</td>
</tr>
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<td>48:00</td>
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<tr>
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<td>Junior Developer</td>
<td>Male</td>
<td>1½</td>
<td>58:00</td>
</tr>
</tbody>
</table>

*Table 1 Overview of respondents*

Since we embarked upon a case study, we aimed to capture the specific context. Mason (2002) states that a reason for choosing a qualitative approach, and especially qualitative interviews, is if the researcher seeks to investigate contextual, situational and interactional phenomena.
Two Project Managers and eight Developers took part in our study through semi-structured interviews where we beforehand had formulated a set of categories with a couple of premade questions.

For our interviews we followed the guidelines in Patton (2002) and were also influenced by Kvale’s seven stages of interviewing when constructing and designing our interview guide (Appendix A) (Kvale, 1997). We constructed it so that it could allow us to have certain topics and subject areas, but also to give us freedom to be spontaneous and build conversational like situations. This allows the researcher, as Patton (2002, p. 344) puts it, to:

“[…] make decisions about which information to pursue in greater depth.”

We started off by identifying potential questions based on our research question and within the field of study. Later on, a few themes started to emerge in which some of these questions were grouped within. Like Patton (2002) says, this gave us more flexibility since the respondents sometimes lead us on different tracks, where we had to adapt and received answers we did not expect from the start, but with the guide still functioning as a roadmap.

4.5 Processing of Data

For this study, an inductive approach was chosen within the frames of grounded theory, using open coding with ensuing axial coding. We have let the data lead the way rather than having any pre-existing frames or significant preconceptions. Inductive in our case also means that we have drawn general conclusions based upon separate cases to establish a general ‘truth’. However, we cannot argue that an outright grounded theory approach has been deployed, but merely the nature and methodologies in which how analysis often is being carried out within the school of grounded theory. The reason for us choosing an inductive approach was because we wanted to understand and interpret the perspectives of different actors (Fejes & Thornberg, 2009).

With this in mind, the data was processed according to the five steps mentioned in Yin (2013). The author is explaining how the researcher in the first step should carefully compile all data, and from that create a ‘database’ to be able to disassemble within that ‘database’. A database in this context can be likened to a desk that you organize and set up in a structured way before you start working. After we had held each interview, we began right away to transcribe the material while it still was fresh in our minds. We transcribed it word by word, so that nothing would get lost on the way. All the transcribed interviews were then stored in a shared folder to make it accessible, while moving on to the next four steps presented by Yin (2013): disassembling, reassembling, interpretation, and conclusions.
4.6 Coding and Interpreting the Data

The next step in the process is to disassemble the data through open coding. We discussed back and forth and weighed our options around the material we had gathered. Yin (2013) adds that experienced researchers often see advantages in skipping coding during the disassembly phase, mainly because the activity becomes less of a routine and there is a greater room for new insights. However, by ignoring to code the material in this phase there is also a risk that judgements become illogical. Walshaw (2006) states that coding is always a subjective process because researchers themselves choose what to focus on and what not to focus on. Neither of us had any substantial experience in gathering data, so we decided to code our data because Yin (2013) explains how that can help to create a deeper understanding. This process helped us, because it made us more reflective about the data rather than rushing it through.

After this process of acquainting ourselves with the data we started to distinguish patterns through a reassembling phase. We used axial codes which means that the result from the disassembling, or open coding phase, will form not only a set of core themes but also subthemes within these, i.e. themes that are part of a bigger theme (David & Sutton, 2016). After disassembling and reassembling the data we then renamed some of them. During this process we merged a few subthemes to make it more coherent and easier to read and to understand.

5 Results

*In this section we will present the results of our interviews under a set of themes that were identified during our coding of data, as mentioned in section 4.*

5.1 Barriers

In this section we have identified themes derived from our interviews that can be understood as challenges when adopting UX practices at SLU and themes that tie into organizational UX maturity.

5.1.1 Time

All but one respondent talked about how time is a limiting factor in their development process, especially regarding UX work and practices. R5 mentions that the user-interface work is frequently done in a “quick and simple” way, saying “just good enough” is the motto. He mentions how ‘thinking for the end-user’ is frequently used as a time-saver while doing UX-related work.
Where we maybe compromise the most is where this interaction and UI analysis happen, so we and our customers I guess we do a lot of ‘thinking for the end-user’, we maybe just guess or estimate what the best implementation is. I mean as a time saver.

– R5

R8 also mentions time as a constraint but does not appear to feel particularly limited by it, as he describes how more time would allow for more detailed UI work. At the same time, he says that the current UI is already quite well-structured, so it would not have a significant impact on the end product. On the topic of saving time: R4 confirms that thorough testing is often neglected, even though everyone appears to think testing is a good idea, be it unit-tests or user-tests.

When asking project managers about time, it is interesting to note that they appear to have a view on the future that differs from the developers’ thoughts; both do not expect a more user-centered approach to take up significantly more time than current development efforts. Both mention how at the moment; a lot of time is being wasted due to requirements being unclear.

I’ve been working with a lot of systems over the years. Okay they deliver what they are supposed to do, but they contain so many misunderstandings, pure bugs, they might not be useful for the first months or even year.

– R2

R1 and R2 express their hope that a more user-centered approach would lessen the amount of misunderstandings and make for a better project outcome, with needing to spend less time on reworking parts that were unclear from the start.

5.1.2 Budget

Another challenge that gets recurrently mentioned by respondents is the matter of budget; available money is a constraint, though it often gets mentioned together with time. This could be due to the consultancy-based way of working (R7), where all projects are initiated by the customer, and the customer has a limited budget for said project. R2, R5 and R7 all mention how money is limited, and how the person in charge of the budget generally will determine how much time is spent on various components.

I would definitely say ‘this is IT development’, there’s always someone paying the bill. The money’s generally restricted, that – if anything – is generally the pattern. Do we have time and money to be investigative, listen to people? Or are we on a budget, which means: just get this done and out and functional.

– R7
It is worth mentioning that R3 and R6 work together in a project where a positive reception of UX efforts in the project actually increased the budget, allowing for more work to be done on this front. So, while budget is a limited factor for UX, good UX can also widen the budget.

*From my point of view, it's a budget thing. Most projects are so focused on functionality that... it is more what we do, not how we do it. And those in charge of the budget are sometimes reluctant to do more than the absolute necessary to get the functions that they need for the work to be completed.*

– R2

### 5.1.3 Prioritization

A challenge that gets mentioned among most of our interviewees is the lack of priority on UX practices within the projects. Although a big part of the prioritization is up to the customer, it is also influenced by the developers and project managers on given projects.

R3 is a junior developer who says he did not see much ‘UX thinking’ when he arrived at SLU a year ago. He took it upon himself to bring that to the project he was assigned to, which caused the priority of UX in that project to increase, ultimately leading to a more satisfied customer. Although R3 has been assigned to a department-wide effort to increase UX, there has not been any outcome of that. R1 argues that this is likely due to lack of time, and not having an expected outcome, making it difficult to have actionable goals.

Interestingly, features that are less visible to the customer and end-user do get prioritised, like for example security (R4, R5, R8). This in contrast to what R2 says about customers often being focused on functionality. ‘Security’ turns out to be one of the components of their internal project guide. This in contrast to UX or usability, which do not get mentioned in their project guide at all.

### 5.1.4 User Involvement

While interviewing our respondents, we noticed that teams generally do not have direct contact with the end-users of their project. There seem to be many different reasons for not-involving them; it is generally seen as difficult to get in touch with them, and most respondents see the customer-representative as the end-user.

R7 states this has not caused problems for research-based projects he worked on, where the customer is the end-user. Opposingly, R5 mentions that this approach caused other target groups to be less prioritized in his project.

*Since our customers know the user best; usually the customer is also the user, and then they know their users better than we do.*

– R5
R4 mentions a similar issue, where the customer is actually one of the end-user groups. While their end of the system is much more frequently tested due to them being directly involved with the development, another type of end-user is seen as a group that needs to be worked with using pilot studies and write formal reports about their experience.

It is noteworthy that both R3 and R6 appear to have a more positive stance on contacting end-users directly and are in fact the only developers we spoke to that mention having been to their end users' workplace to study how the application will be used in practice.

Other projects tend to mainly see the customer representative as the end-user. In case other user groups need to be targeted, R5 mentions how they “think for the user”, in order to be more time-efficient. Contradictory, some respondents mention they have very little insight into what the end-users of their application are actually doing. Even though some projects have managed to involve actual end users, R3 states there has been an issue where both sides speak different ‘languages’.

"We are kind of talking different languages. We, the developers, think of functions and frameworks. They [users, red.] mainly focuses on the [...] and their work processes. So, we had to explain almost everything from how a development process works to how a computer system works behind the buttons they see"

– R3

Besides end-users possessing different technical skills, R2 mentions that he thinks the end-users themselves can be hesitant to be involved in the process, even when the goal is to ease their workload.

"As I said it is always scary to go from something you know to something that you haven’t seen, even if the goal is to make your work easier, to change a known routine into a new routine that you must adjust or maybe relearn that is always scary, and it takes time, from every affected user."

– R2

5.1.5 Communication

During our interviews, we noticed that a lot of our respondents talked about communication in one way or another. Besides not having much contact with end-users, there also does not appear to be a lot of communication about UX between different developers. Respondents generally seem to be unaware how other projects handle UX-related tasks, and there appears to be a communication gap between developers and project management on the topic as well.

The developers we interviewed generally are aware of the necessity of doing user-centered design, but do not feel their project managers care about it. At the same time, R1 mentions how
he has the impression that a lot of developers do not care about UX, or working in closer relation with the customer.

Some of the developers just don't want to work with the customer. They want to code, and it's as simple as that.

– R1

Although project management has initiated some internal projects regarding UX, a lot of respondents mention that their project managers have not really talked about the topic. It seems like R1 and R2 see the need for more UX practices to secure clients and revenue, while a majority of the remaining respondent did not regard it as a priority. UX is therefore not spoken about out loud.

It's not from them directly that they openly speak about UX.

– R6

5.1.6 Trust and Relations

Not only did our respondents find it difficult to get in touch with end users, communication between internal and external project members also can be a challenging topic. R2 and R4 identify trust as a potential issue for customer relationships, while R7 mentions that having a good relationship with the customer even is vital for communication.

But trying to get it to match someone's ambitions and goals, you really have to understand the people who want it, and what they actually want. Not necessarily what they're saying or writing. And that comes through relationships. So, the start of a new project with a new project that's vital. That's where you find each other.

– R7

5.1.7 Lack of Consensus Regarding the Value and Understanding of UX

In general, our interviews tell us that most respondents that we interviewed see the increasing need for ‘good UX’ in applications but seem to have different views of the importance and what User Experience is – compared to research and academia at least. Some perceive the value of UX within specific projects but not others, some see the visual parts as UX while some describe the complexity around certain systems.

Nevertheless, some of our respondents feel like their own project does not have a need for more focus on UX – but can understand a need for it in other projects. R7 thinks that there could be a massive need for it at the university but could not relate it to current projects. While R5, regarding the need for UX said:
For the university site a lot of time is focused on UX/UI. But not with this project and not with some of the other projects who are more geared toward researchers or research data.

– R5

Most of our respondents seemed to think that the kind of system and potential user interfaces affected potential UX practices the most. R4 mentions that user experience is depending on what kind of system it is, and that they for example are not going to provide an “extreme experience” within their system, because it is focused on daily work. R6 said the motivation behind working more UX focused and learning techniques mostly is on whether some kind of interface is involved.

It depends on if you work with interface or if you work with something else, but I believe that people think it’s important.

– R6

Another thing that is worth mentioning is how SLU operates. They do not compete as a regular business-to-consumer or even business-to-business company. This is something several respondents touch upon when explaining their projects. R7 says that:

But generally, we’re an institution and they don’t move very fast. And we’re not in a competitive market. Absolutely not. We’re not competing for likes or money. If you’re in the competitive market, you need to stay on top of the game and follow trends. Then UX has definitely got a part to play.

– R7

As mentioned do many developers emphasize UX and UX practices as an important quality in any software that needs to be focused more on in projects. However, as R6, R7 and R2 mention it is often functionality that gets prioritized before usability and experience while R2 also mention that the topic of phasing more UX into projects has not really been brought up between stakeholders:

Not in a deliberate way maybe [...] to affect UX and to affect usability. But, it is more something that has been put on the designer’s lap when you develop a system, there is those non-functional requirements in the picture, but they are often step motherly addressed.

– R2

In functionality-focused organizations it is easy to consider UX practices as something on the side, and not a core value, something that symbolizes the business. R1 saw UX as a differentiator while explaining aspects such as revenue, reputation and delivering projects within time
while R7 did not see it at all because he sees SLU as being in a non-competitive environment. R6 mentioned, regarding having UX as not part of any concrete strategy to this date that if everyone had a similar understanding of UX it would be clearer how to work:

 [...] if everyone is on the same page and has the same thinking but for now it’s more like it’s up to one self to learn more.

– R6

6 Discussion

Designing for User Experience is not rocket science by any means. It is about involving users throughout the development process and having an iterative approach. There are of course numerous of ways to do that, and there are also different opinions on what the best way is – depending on budget and other capabilities. As described in section 3, research shows that significant factors to achieve a higher UX maturity are mindset, communication and acknowledging the value of UX practices (Vetrov, 2013).

What we present below should not in any way be seen as a universal truth that can be applied to every organization, but instead an interpretation where we have drawn conclusions in a data-driven manner. Furthermore, we will offer insights in how developers and project managers themselves perceive challenges and based on those provide an alternative model which we believe better suits the organizational landscape that SLU’s IT department is part of.

Research presented in section 3 highlighted the importance of having enough time allocated for user involvement (Detweiler, 2007) (Rosenberg, 2014). This seems to be in line with suggestions that the agile sprints do not really support UX practices in a wishful way if you consider that sprints or timeboxes work in a time-constrained manner. Especially when an organization lacks UX practitioners and does not have any emphasis on it in their development approach, making UX work often have a lower priority than adding functionality. Our findings correspond with that research, showing that these challenges can also be identified within the IT department at SLU.

Another interesting find, is that our respondents often see the projects they work in as separate and disconnected entities while they do not seem to have any deep insights in other ongoing projects, despite their modest department size. One could visualize this as screened-off islands, an archipelago, rather than a unified piece of land with common governance. Respondents felt like UX could be of importance, but only for a limited set of projects. The UX climate on each different island seems to differ greatly, where UX reigns one island, there is no sign of it in other projects. While we understand that people will always be more involved with the projects they work on themselves, our respondents seemed to know remarkably little about other projects going on within the department.
In contrast to project managers’ expectations about developers not being interested in UX practices, our respondents actually do show signs of being interested, but do not feel encouraged nor informed enough on the matter. There seems to be a miscommunication between team members and management, as ‘improving UX’ is an item that managers do talk about, even going as far as making it a company-wide point of improvement. This has not reached the other parts of the department however it seems. As mentioned in the research, clear roles and distribution regarding UX practices is important. However, respondents feel like this has gone unnoticed, leading to unclear roles and expectations. This unclear role of UX thus far is being reinforced by one respondent stating that there have been efforts on sharing UX throughout the company but due to unclear goals it got scrapped.

It appears that communication within UX-immature organisations without UX practitioners becomes even more important. In more UX-mature organisations, practitioners often have a role of pushing through ideas to developers and clearly work together in a different way. This leads to the ‘why’ and ‘how’ behind the organisational strategy needing to be clearly emphasised in immature organisations. Since there are no practitioners, the goals and reasons can’t be ‘black-boxed’, as this apparently leads an unclear view of what need to be done for other parties involved.

Some junior developers seem to be more interested in the topic of UX, and have attempted to bring it in to the projects they have been assigned to. Due to this leading to positive experiences, an initial effort has started to make the department’s way of working more UX focused. Despite this being started, no real outcome of this project has been achieved so far; apparently due to the goal of the project being unclear. In the related research Vetrov (2013) speaks about priorities and how the value needs to be understood along with ‘how’ and ‘why’ an organization is going in a specific direction.

It seems that the lack of ownership of UX is the main cause of this. Whereas more invisible aspects like security and privacy get managed well, having go-to people on the work floor, this does not yet seem to be the case for UX. Aspects like security also get mentioned throughout the internal project guide, whereas UX design does not get mentioned.

Responsibilities have been vaguely assigned to people in some of the projects that seem to have an interest, and no clear orchestrated efforts that are mentioned in the maturity (as mentioned in section 3) efforts has been embarked upon to tie it in to deliberate strategic approaches. This is something Hauser (2007) points out as a key factor whilst designing for UX.

Perhaps the main reason for the aforementioned project having not been followed through is a lack of shared understanding as to what ‘UX’ actually is. Respondents commonly described UX as a ‘topic not being talked about’. Since it is not a topic of discussion, UX has a lack of shared understanding, underpinned by all respondents having their own view of what it entails. Taking McLeod & MacDonnell (2011) into account, this means that UX, lacking a common understanding, does not have organization-wide behaviour impacts. Research (McLeod
& MacDonell, 2011) also highlights that if everyone involved in the development process does not share the same goal or understanding, people are not going to work as a team either - which is the idea with UX practices.

If you compare respondents’ different views of what UX entails, you end up with a varied selection of terms. When comparing it to the model described by Preece et al. (2002), you notice that the terms mentioned tie more into usability than user experience. Besides seeing it as usability, most respondents also seemed to view ‘UX’ more as a layer of paint than the actual foundation of an application.

Often, UX-related decisions are not based on contact with end-users but based on thinking in place of end-users, either by the customer or developers on the product teams, in order to save time. The customer is almost uniformly seen as a personification of the average end-user, and developers often seem to have struggles with providing a suitable user experience for other user groups.

Despite there being a positive reception to the idea of having a more user-centered development process, most respondents tended to be very hesitant to involving actual end-users. The only respondents that were positive about this strategy are both part of the single project at the department that has actually been working most with actual end-users. Most respondents mention how involving end-users would be time-consuming, complicated and lead to requirement bloat. The respondents that were already taking this approach however, don’t mention these negative aspects; they appeared to be mostly proud of how their project has been able to assist end-users in their tasks.

A few of the participants point out how the projects that have included end-users through UCD approaches more thoroughly also had greater success in meeting user needs, decreasing cost and the amount of time spent on rewriting parts of the system. This also highlights some of the points Vetrov (2013) made in the related research about projects having a larger chance of success when the UX maturity level is higher. The general understanding of UX practices and approaches affects the outcome in many ways – not only for the user.

The IT-department at SLU clearly lacks a defined strategy on how to incorporate UX in its current state. Based on Feijó (2010) and Nielsen we deem that SLU floats between stage two and three in Nielsen and place them on level two on Feijó’s scale. However, we do not think that these models can explain our findings in a good way. They possess some of the traits of Skunkwork Usability and Develop-Centered Usability, but also some parts belonging to level three.

6.1 Introducing the ‘Maturity Map’

The currently available UX maturity models are too focused on visible fixes and timeframes, while we aim to highlight organizational capabilities that tie into UX practices. We aim to offer a bird’s-eye view on how to approach UX, describing potential strategies along with some more
tangible ideas. As explained, UX practices need to become one with the development process, otherwise it will be hard to integrate it. We suggest adding UX-checkpoints to get communication going, achieve consensus regarding the understanding of UX, make sure design decisions are informed, enable collaboration and answer how many users and in what way they were involved in the process. We believe this could be a good start in adopting a more aware mindset among employees at the IT-department, instead of black-boxing it or making it too abstract.

Our map should be viewed as something that has the potential to inform organizations what they need to think about when incorporating UX practices into their system development. It also aims to serve as a pointer on aligning business strategies with UX-strategies, rather than to have them as separate entities, and how to pursue maturity further. It aims to be descriptive in the way how organizations can assess the here-and-now situation but also has prescriptive elements to serve as a roadmap for improvement (De Bruin, Freeze, Kaulkarni, & Rosemann, 2005).

![Figure 3 Maturity Map](image)

The challenges we identified can be grouped into four themes; communication prioritization, strategy and attitude. Comparing views and behaviour to prior research, we can identify traces of immaturity in each of these fields. These challenges should not be seen as completely separate issues however; prioritization is related to communication and attitude, as well as overall strategy. Tackling the issues in one part, will also affect the issues experienced in other topics.

This overview, presented in form of a map, was not something that was planned at the start, but came about while doing our interview and research analysis. The metaphor used is based
on how we described the communication gaps, and also fits in with SLU’s environmental focus. It can hopefully help similar organizations assess and analyze their own UX maturity and help them lay out strategies for the future.

If we zoom in to each area individually, we have identified the following struggles:

- **Prioritisation** is an issue because there appears to be no leadership on the field of usability; no one pushes the matter actively, and no one really ‘owns’ the topic.

- **Communication** needs to be clearer. Right now, there is not enough communication across projects. The motive for UX also need to be communicated more loudly.

- **Strategies** and milestones need to be formulated. UX is not part of the overall strategy at this moment. Simple tools such as UX checklists can be used to align practices within the organization.

- **Attitudes** need to be aligned within the teams. Right now, team members appear to be on different wavelengths when it comes to understanding UX and the value of it. Though participants see the need for UX in general, they do not really see the need to apply it on an organizational level.

### 6.2 Strength and Weaknesses of the Present Study

Since qualitative research is particularistic in its broad nature, it is often argued *how much* and *if* research from qualitative studies can be generalized beyond a given study (Yin, 2015). In our case it is easy to understand the concerns, since we only investigated one organization instead of several when drawing conclusions in our analysis and later establishing a maturity map that has not been evaluated due to time constraints. Rowley (2002) explains that a strength with case studies is that it has “[...] the ability to undertake an investigation into a phenomenon in its context; it is not necessary to replicate the phenomenon in a laboratory or experimental setting in order to better understand the phenomena”.

We believe that conclusions drawn in the discussion align with prior research, and the majority of respondents came with similar answers which points towards some kind of generalization. Our respondents were not homogenous in any way, but consisted of various backgrounds, ages and previous UX experiences. Since a case study is the result of a phenomenon in its real-world context, it has some ground, but the maturity map needs to be validated on several cases, and over an extensive period to validate it. But based on our findings we have reason to believe that it should be applicable to some extent.

Ritchie & Lewis (2013) state that multiple perspectives can be collected in a case study, and include people with various interests and perspectives on the study object in question. We believe this is a strength in our maturity map, because we have managed to gather both developers' and project managers' thoughts and feelings – which are the two roles that are responsible for development but they can also have different motivations.
6.3 Future Work

For future studies it would be interesting to do a multiple case study instead of a single case study, gaining more insights in UX-immature organizations to understand motives, challenges and tools to overcome this immaturity. We also see how an ethnographic study can provide even more actual insights in behaviours rather than solely reported behaviour. Interviews do not always tell the entire truth, so to observe how people work, think, and talk about UX would give valuable insights in addition to our findings. Patterns, norms, rituals and values are often deeply engraved in an organization so that it can be difficult for interviewees, and people in general, to be unbiased. In our specific case it would be interesting to go back to SLU to see if these insights and findings have led to any tangible or measurable changes for them. In order to do that, we imagine interviewing the same participants and perhaps the customer, to understand all parties and perspectives involved to leave no stone unturned.

7 Conclusion

SLU approached us because they wanted to get more insight in the process of UX practices and possible suggestions on how to improve theirs. In this study we have gathered information and conclusions which may have been difficult to obtain otherwise. We have provided SLU with a roadmap in the form of aspects they need to consider and address to become more mature in their strategical approaches. We believe to have provided them with not only opinions that cover organizational issues but also on other levels. Furthermore, SLU was not particularly interested in any specific tangible outcomes, but rather to get a view of the road that lays ahead and insights in the UCD process – which we believe we have given them. We have answered our research question and recognized challenges deploying UX work and practices within an in-house IT-department.

Our study contributes to a deeper understanding as to what developers and project managers in an in-house IT-department perceive as the main challenges trying to integrate UX practices. In relation to other research, we are providing another type of understanding of UX maturity in the sense that no UX practitioners are involved. These findings could cater to other organizations that compete on similar terms, trying to adopt UX practices into their strategy.

Where a lot of previous research suggests hiring UX professionals to increase the quality of UX practices, our study puts emphasis on that UX practices should be integrated throughout the whole organization, before taking this step. Instead of separating UX practices to a practitioner role, our maturity map highlights that the UX aspects identified (communication, prioritization, strategy and attitude) first need to be unified within the organization and across teams. We discovered that what academia explains as UX does not necessarily align with how developers and project managers see it, roles that are very much are shaping the outcome in any software development project.
“No product is an island. A product is more than the product. It is a cohesive, integrated set of experiences. Think through all of the stages of a product or service—from initial intentions through final reflections, from first usage to help, service, and maintenance. Make them all work together seamlessly.” – Norman (2009)
References


