IT SYSTEM INTERACTION PROBLEMS CAUSED BY INTERFACE AND WORK ENVIRONMENT AND USERS' PERSPECTIVE TO SOLVING THESE PROBLEMS

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Abstract
User Experience is an important factor in improving IT system interfaces and work environments. The user may find difficulties using the interface because of different problems. This study is going to examine which problems a user may encounter while interacting with various interfaces. The literature informs the methodology used in this study. Qualitative method is used in the form of semi-structured interviews. The participants in the interviews answered questions regarding how well they knew about User Experience, which problems they found while interacting with the system, and how these problems could be resolved to lead to a better experience. The work environment is examined in this study as well. Previous research as well as the findings from this study serve as the base for analysis of the data which has demonstrated the variety of individual user experiences and difficulties while using various interfaces. The experience is highly individual and differs from person to person. However, the most frequent common problem was found to be inherent to the interfaces and information overload preventing users from easy interaction with interfaces.

Keywords: User Experience, Interface, Interaction, Work-Environment

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Chapter 1: Introduction

The digitization of all business and every-day processes is increasing. Today digital interfaces are used by all age groups in all possible human activity processes. Digital interface is defined as a medium through which people interact using visual, acoustic and operative elements (Gibbs 2015). The COVID-19 lockdown demonstrated the need for the further development of this field. Therefore, it is essential that the interfaces are user friendly and easy to understand. This research study examines user experiences with digital interfaces including the problems that users encounter and the possible solutions to these problems. Throughout this thesis, the terms "UX" and "interface" will be used to refer to user experience and digital interface respectively.

1.1 Background and purpose of the study

User experience (UX) is considered a comprehensive concept describing the subjective experience with a technology (Kaasinen et al. 2012). Although the UX concept is still quite young, it has some assumptions that are accepted widely. For example, UX is generally dependent on the individual as well as contextual factors such as physical, social and cultural aspects of use that can be dynamic and temporarily evolving (Kaasinen et al. 2012). The UX is manifested through user emotions and behaviors such as facial expressions, vocal expressions and physiological reactions. These experiences are considered assets in the business of product development. To be successful, companies need to create easy to use software for their customers. For existing products, customer research is focused on discovering areas of product design improvements (Kaasinen et al. 2012).

Users are constantly working with various interfaces in order to satisfy their needs, but sometimes the use of interfaces can be perceived to have shortcomings in functionality, design and productivity. Donald A Norman (1998) writes, "I push doors that are meant to be pulled, pull doors that should be pushed, and walk into doors that neither pull nor push, but slide" (Norman 1998, p. 1) in describing how a design can affect the user experience in a negative way.

Creating usable websites and applications involves more than just knowledge of IT. Effective design is a user-driven process that anticipates the needs of users by consulting them throughout the development of interfaces. UX (user experience) is a result of the design process used to create products that offer meaningful and relevant experiences for users (Interaction Design Foundation n.d). It can include aspects of branding, design, usability and function. Products that offer good user experiences are not only about the use of the interface, but also the whole process of acquiring, owning and even troubleshooting. There is no common definition of a good design, but the key idea is that a product offers a good user experience if it meets the user's needs in different contexts in which they use the product (Interaction Design Foundation n.d). According to Norman (1998),

> Designing well is not easy. The manufacturer wants something that can be produced economically. The store wants something that will be attractive to its customers. The purchaser has several demands. In the store, the purchaser focuses on price and appearance, and perhaps on prestige value. At home, the same person will pay more attention to functionality and usability. The repair service cares about maintainability: how easy is the device to take apart, diagnose, and service? The needs of those concerned are different and often conflict. Nonetheless, the designer may be able to satisfy everyone (Norman 1998, p. 35).

The process of user experience means developing a product in a manner, where all aspects of the user's experience with a product are carefully studied and considered during the product development. This means taking into account every action the user is likely to undertake and understanding the user's expectations at every step of the developing process. Dividing the creation of the user experience into component elements enables the developer to understand the task as a whole better (Garrett 2010).

Developing a good design, that is a long-term process, contributes to usability, good user experience and efficiency: interfaces become tangible, graspable and immediate; and software systems become engaging as well as functional (Benyon 2014). This study analyzes human behavior when interacting with an interface and shows how the UX, behaviors and feedback from users can help to identify problems that make it difficult for the user to interact with the system. The study also seeks users' perspectives of how to resolve these problems.

I have chosen to focus on interface and work environment, because in the field of IT, the UX is related to interfaces and the work environment which can together influence interaction with the interfaces. It was interesting to discover different user interaction problems that are caused by both user interface and work environment. I assumed that there is a connection between user interface and work environment as the environment itself can impact our behavior in our daily interaction with the interface.

1.2 Research question(s)

This study addresses the following research questions: 1) What problems related to UX concerning interface and work environment do users identify in interacting with digital interfaces? 2) What perspectives do users have in solving the problems that they encounter when using the interfaces?

1.3 Knowledge contribution and target group

The present thesis contributes to the extant body of knowledge in the area of user experience particularly in relation to interface and work environments from the perspective of the users. Addressing the research questions of the study will serve a variety of groups. First, the findings of this research provide insight to IT developers. Second, the results of the study benefit organizations that rely largely on technology and human capital in conducting their mission. Third, the findings from the study benefit the personal use of the interfaces in order to provide the users with a smooth experience when interacting with the interfaces.

1.4 Scope of the study

This study focuses on the experiences that participants had in using interfaces on a daily basis when the interface was functioning as usual. The study does not examine hardware failures that may affect an IT system and its interfaces, neither does it provide solutions for software error improvements.

I had initially planned to do observation as a second method for data collection; however, this plan had to be discarded given the COVID-19 pandemic. As the situation around the world changed due to the spread of the virus, many contacted companies refused to cooperate or respond to invitations to participate in the study. Larger participation in the research would have provided a deeper understanding of the user's experience and its contribution to the

improvement of the work environment and interfaces. For example, in-situ observation method could have been used involving close contact with the users to observe working conditions and the interaction between users and interfaces. Given the lockdown and social distancing measures, I only used distant interviewing as the method for collecting data.

Transferability is the degree to which a particular research can be transferred to other contexts and other participants (Korstjens & Moser 2018). With regards to usability and transferability, I can only state that, given the particular time in which this research was conducted (i.e. the lockdown caused by COVID-19), I cannot predict how and if my research can be transferred to other contexts. If remote working becomes a norm in the post-COVID era, it is possible that my research method of distant interviewing be replicated by other researchers.

Chapter 2: Literature Review

The content of this chapter discusses the literature around the impact of user experiences on improvement of interface and work environment. This chapter consists of three sections. The first section examines the literature in relation to the interfaces. The second section discusses work environments. This section consists of two parts. The first part discusses the physical work environment. The second part discusses the digital work environment. The third section of this chapter discusses human capital. This literature was collected through PRIMO (the electronic search function at the library at the University of Borås) and other reliable sources and websites.

2.1 Interface

The purpose of this section is to show literature findings that play a significant role in user experience with the interfaces. In doing so, it provides definitions and discusses possible difficulties in use of IT systems that affect the interaction with the interface.

In the Encyclopedia of Information Science and Technology (2015), digital interface is defined as an interface with which people interact through visual, acoustic and operative elements and that interface provides the communication between a user and product or system (Gibbs 2015). According to Garrett (2010), user experience (UX) is the experience of people with the product used in the real world. When the product is evolving, people observe what it actually does and can do. The UX should be monitored, as it reflects how the software works. The UX provides a basis to distinguish between a successful and a failed product. The UX is not about a software's internal function; rather, it provides valuable information as to how the software works externally when a person interacts with it. User experience also reflects feelings and impressions while using a service or product (Garrett 2010). User stories can help better understand the individual users' experiences and capture the individual's perspective within a given context (Gruen, Rauch, Redpath & Ruettinger 2002). Experiences can be deconstructed to understand surface effects and emotional responses (Gaver, Dunne & Pascenti 1999).

As an example, people's experience with online-purchasing and relevant platforms is widely researched by scientists (Garrett 2010). The experience is developed starting from the time a user enters the website and finds the necessary product, provides his (her) credit card number and personal information, and the website confirms that the product would be shipped. The experience is formed based on all factors and decision-making processes involved, from how the website looks, reacts and up to what extra opportunities it offers (Garrett 2010).

Another example includes the experience of pleasure and engagement of viewers of videos played on smartphones and on desktop screens (See-To, Papagiannidis & Cho 2012). Both pleasure and commitment in watching the film clips are important factors for satisfaction. Pleasure also has a higher impact on commitment to use the interface. For example, viewers feel less engaged when they watch an action film on a smartphone. Instead, videos on the desktop computer create more emotional response and thus more connection to those videos. Smaller screen size of a smartphone means that the user needs to spend more time to process and get involved with the content while watching a desktop computer does not require as much time. An added problem to the smartphone is that a text message or a phone call can disturb the user and can hinder concentration (See-To, Papagiannidis & Cho 2012).

The study by Getto and Moore (2017) delivered some samples of the user experience while using the GIS (Geographic Information System) in form of user answers in the survey,

I've always had some problems with a lot of the stuff online because a lot of the stuff we do. . . is being written by someone who knows what they're doing to make sense within the product. But if you do not have that basic information. . . Like me, as I know what [the layers icon is] because I have some experience with GIS, so it looks like a sandwich or something (Getto & Moore 2017, p. 22).

Ideally, developers in the system development process need to try to make the finished IT systems understandable to the end users without making it confusing by giving the users opportunity to know and understand how to use it (Alvertis et al. 2016). The UX Design has been explored in the software engineering process. Najafi and Toyoshiba (2008) described the way of its integration into the agile development practices. Buchenau and Suri (2000) developed a methodology for experience prototyping, using paper-based systems to test and to explore a proposed experience. Hooper and Millard (2010) used TAPT, a formal method based on Dix's (2018) view of experience deconstruction where an existing system is deconstructed and reconstructed in a new context by maintaining positive experience aspects (Millard, Borthwick, Howard, McSweeney & Hargood 2013).

The UX design is unfortunately often underestimated or considered as a simple or extra choice that is available only for projects with a longer timeline or a larger budget (Coatta & Gosper 2010). A careful user experience design is crucial and it should cover the uses of multiple platforms including both web-based and mobile applications among others. The focus on the UX can have a significant impact on the architecture, data structure and processing algorithm of software products (Coatta & Gosper 2010).

Users of interfaces have different reactions regarding the delay time which may occur while using the interface. This means that people with shorter attention spans are proportionally more affected by these delays (Doherty & Sorenson 2015). When users are in the flow, they do not pay attention to the interface or its speed of function, they are concentrated on the work and check if the progress is being made towards their ultimate goal (Doherty & Sorenson 2015). These interactions can become automatic as the flow increases. Nonetheless, when users are encouraged to pay attention to the details of what they are doing, their activity may be disrupted and that in turn affects their performance. For example, when skilled typists are asked to pay attention to specific letters and fingers when typing, their performance might be significantly reduced (Doherty & Sorenson 2015).

Employee's involvement in improving user experiences has been an area of focus in the literature (e.g. Sandblad, Gulliksen, Lantz, Walldius & Åborg 2018). According to a survey conducted in Kungsbacka municipality with its personnel, there was a lack of interest on behalf of the personnel in resolving interface weaknesses. The interviews with the personnel found that the personnel did not have enough time, will and commitment to participate in system development and improvement projects, and that they would rather leave the responsibility to the management team (Johansson, Holmquist, Thomsen & Åkesson 2018).

A discussed throughout this section, the users of the interfaces can include the citizens who use the interfaces for shopping, art or entertainment. The users can also include the staff and employees of an organization. The users of the IT systems in the context of the workplace, include the majority of the people who, with their position in the organization, run an organization's work (Sandblad et al. 2018). They may work individually or in a group while representing a group that works with similar tasks. For example, doctors and nurses represent health professionals; cashiers and front line workers represent boutiques and businesses; case officers and administrators represent authorities and leaders; and teachers represent school

educators. All these people, as daily users of their organization's IT systems, are impacted by the system's quality. Therefore, they can contribute to developing these systems (Sandblad et al. 2018).

2.2 Work environment

This section discusses the literature in relation to the work environment while using interfaces. Physical work environment and digital work environment are discussed separately.

2.2.1 Physical work environment

The Swedish Work Environment Act (SFS 1977:1160) requires that employees work in an efficient work environment. According to this act, the work environment should be developed in such a way that it takes into account the nature of the work including its social and technological aspects. Working conditions need to adapt to employees' different mental and physical capabilities. Similarly, the employees need to have the opportunity to participate in designing, developing, or changing their work environment. Everything included in a work environment must be made in such a way that it brings no physical strain or mental stress on the employees. According to AML (the work environment act), the employees need to work in a supportive environment that is conducive to work productivity as well as employee wellness (SFS 1977:1160).

When it comes to an open work environment, external factors such as odor or disturbing noise affect the use of interfaces in a negative way. The individual's behavior deteriorates with polluted air or disturbing noise which lead to decreased productivity (Benyon 2014). The physical work environment also includes work tools and instruments which may impact the employee in a negative way (Sandblad et al. 2018). Such tools and instruments include work settings such as furniture, computers, screens formation and size, work area, temperature, ventilation and lighting. Users of an IT system may suffer from these negative impacts, for example while entering data into the system under uncomfortable work conditions. It can also affect their vision while looking at the computer screen with high or low lighting in their work environment. These factors can make the users encounter difficulties in order to understand and be aware of their interaction with the system (Sandblad et al. 2018).

Benyon (2014) presented a survey study the results of which found that the physical improvement of the work environment led to the improvement of productivity in a company. The researchers improved variables such as the temperature, lighting, humidity and length of a work shift. The workers were placed in separate experimental rooms where each of the factors varied. It was discovered that each change led to productivity, and the result showed that even after all improvements were removed, productivity remained at the same high level (Benyon 2014). It means that, over time, the workers became habituated to the improvements that were made and their performance remained steady even after post-improvement changes.

2.2.2 Digital work environment

Cognitive psychology studies human perception, attention, memory, learning, decision making and problem solving that are related to user experience with the interfaces (Sandblad et al. 2018). In a digital work environment, there are some obstacles and disturbances which can impact or make a conflict with the cognitive functions. Such disturbances occur if the IT system has an inappropriate functionality, a poorly designed interface or if the user does not have sufficient skills. If a user is constantly interrupted by the need to interpret an error

message, to retrieve information that is no longer visible on the screen or to assess the size of the scroll bar, the user's cognitive load increases and affects the efficiency (Sandblad et al. 2003). These obstacles are also associated with the design of the information system, an inappropriate organization of the work, or an insufficient managerial support which may prevent workers from using their skills effectively (Sandblad et al. 2003). These kinds of loaded and obstructive factors may cause problems in the digital work environment as well as risks to human health (Sandblad et al. 2018). Therefore, an essential factor in designing a software is the cognitive load in the work environment.

There is a clear documentation relationship between well made and usable IT-systems and services with high efficiency and feasibility. Research has shown that high productivity can be reached by implementing organizational changes and effective work processes through digitization (Sandblad et al. 2018). The good work environment is an investment based on more effective work processes where employees contribute better and where the acceptance of adopted IT-system increases. Without usable IT-systems and a good digital work environment it is impossible to maintain endurance work and good productivity. Good digital work environment and high productivity are two factors that work together (Sandblad et al. 2018).

Usability is a central quality that is fundamental to a user's perspective in interaction with digital support systems at work. According to ISO 92 41-11, the concept of usability is the extension in which a product can be used by a specific user in order to achieve a specific goal with expedience, efficiency and satisfaction in a specific usage context (International Organization for Standardization 1998). In other words, a product must be easy to use by the customer, and in this case by a user of an IT-system, providing a user friendly interface which is understandable. A system with a high degree of usability will be efficient in helping people do their tasks with appropriate amounts of effort. A usable system brings appropriate functions with information in an organized way as its platform is easy to understand and work with and in which the user can make things work and reach their goal (Benyon 2014).

2.3 Human capital: Literacy and education

In addition to the interface itself and the work environment, human capital influences the user experience. Human capital consists of skills that are either inherited or acquired by the individual (Kucharčíková 2013). In relation to the acquired skills, education and literacy (in this case IT literacy) are essential elements of the human capital (Mellander, Savvidiou & Gunnarsson 2001). It helps to know if the various interaction problems discussed earlier are also caused by lack of IT knowledge or not. Literature shows that the users with higher education have better understanding about user experience, usability and user friendly softwares (Mellander et al. 2001).

For workers whose university education lies within a common field of study, the indirect effects of IT development and growth are higher (Mellander et al. 2001). Furthermore, the users that have higher access to and use one or more systems, have more experience about these systems and their functionality (Mellander et al. 2001). This ability makes them better understand design or functionality issues in a system and contribute to fixing these issues drawing from their feelings and experience (Rintoul 2014).

Mellander et al. (2001) discussed the issue of productivity paradox that was current in the 1980s and 1990s. According to this paradox, the more investments were being done in the field of IT and its growth, the less significant the impact was in the productivity of human

labor. In other words, growth and development in the field of IT did not necessarily help improve productivity in human labor. At the same time, lower investment in the IT systems and developing systems with low usability, makes users spend a lot of their working time on unproductive computer problems (Nielsen1993; Vicente 1999). Researchers found that the productivity of human labor in the field of IT was moderated by the human capital in terms of the level of education and IT literacy (Bresnahan, Brynjolfsson & Hit 2002). They found that growth in the IT system and the human capital had to work in tandem in order to lead to productivity of the organization.

Given the above-mentioned considerations, the IT investments must be adjusted with organizational changes. Too much attention has been paid to technical equipment, both to hardware and software, whereas little attention has been paid to the "human capital" (Mellander et al. 2001) and the way people use technology. Organizations with higher levels of both IT and human capital demonstrate better productivity growth than other organizations, while organizations with high IT levels but low human capital are even less productive than those with low levels of both IT and human capital (Mellander et al. 2001). The important conclusion is that IT investments must be combined with skills upgrading to have a positive effect on productivity and efficiency growth (Sandblad et al. 2003).

My literature search in the area of human capital identified a number of knowledge gaps. First, the role and position of the user has not been identified in these studies. Second, there is no knowledge in studied literature about users coming up with their own ideas to find solutions while interacting with an interface. Third, there is a knowledge gap in worker's efficiency in the cognitive work environment. The research does not show the result of interference that can be caused by a messy environment when a user is watching a video. Last, there is no information about technical errors that can occur on small screens interrupting the use of the application by the user. As discussed throughout this chapter, a variety of factors influence the use of interfaces. While the importance of ease and usability of interfaces have been emphasized, it is also important not to overlook the role of physical and digital work environments as well as the users of the interfaces and their skill level. The condition of work environment, digital work environment and human capital together make an experience for users of IT systems helping them to contribute to improvement of both work environments and digital interfaces. This experience is the result of observation, feelings and impacts of cognitive loads which are identified by the users. Usable IT systems lead to increase in human productivity by making the working process easier for the users and satisfying the users and bringing a good and pleasant user experience.

Chapter 3: Methodology

The study used the qualitative research methodology. This section is divided into six main sections. The first section discusses the theoretical framework that guides the analysis of the findings. In the second section, the process of recruiting the participants of the study is described. Third, the method of data collection is discussed. Fourth, the method for analyzing the data is discussed. Fifth, the limitations, reliability and validity of the study are discussed. Last, the ethical considerations are provided.

3.1 Theoretical framework

Social constructionism and interpretivism is the paradigm that informs this study. According to social constructionism, knowledge is not determined in advance. Instead, it is continuously constructed by people and communities through different situations, histories and languages (Allen 2017). Interpretative research is a base in social constructionism and by adopting the interpretive framework the collected data will be analyzed as interpretations (Recker 2013). Based on this paradigm, the research process is a kind of social process that is influenced by social needs, development and expectations as viewed in social constructionism and interpretivism (Recker 2013).

In line with social constructionism, qualitative inquiry is used to inform the present study. Denzin and Lincoln (2005) defined qualitative research as,

> a situated activity that locates the observer in the world. Qualitative research consists of a set of interpretive, material practices that make the world visible. These practices transform the world. They turn the world into a series of representations, including fieldnotes, interviews, conversations, photographs, recordings, and memos to the self. At this level, qualitative research involves an interpretive, naturalistic approach to the world. (Denzin & Lincoln 2005, p. 3)

In qualitative research different methods can be used for collecting qualitative data including open individual interview, focus group interview, observation and document research (Jacobsen 2017). Social constructionism and qualitative methods are well suited to be used as an analytical lens to discuss the research questions of this study.

3.2 Participants

The criteria for selecting the interview participants follows a purpose-driven approach (ändamålsstyrt urval). Jacobsen (2017) has listed four methods of participant selection among which I have selected the informant selection method. This method includes the selection of participants who have information, insight and entry to the field. These participants have extensive knowledge in the field and they are willing to participate and share their insight with the researcher. In order to identify these participants, it is imperative to understand what information these participants have and where they draw their information from.

I used at least one criterion in selecting and seeking the research participants. The participants had to have daily interactions with diverse digital interfaces. I wanted to make the findings of my research meaningful by seeking to recruit participants who had a vested interest in this topic. This criterion required at least an average level of digital literacy on the part of the participants.

Having set my criterion for recruiting, I invited individuals from my own social network as well as by word of mouth. By studying the UX competence, I identified possible participants through company websites and personal contacts. Thus, I turned to those who used a specific system during the working day. This factor played the most important role even in cases when they did not have broad specific knowledge of UX at the company where they were employed. Through this approach, I have obtained a selection of participants differentiated by their background and experience, age, gender, entry into the profession, education, years in the profession and the tasks performed. Using personal invitation by phone call and email, I started contacting the participants directly. Among the invited persons, five accepted my invitation to participate in the study. These participants were from different companies and were playing various roles that enabled me to reach a broader understanding of different experiences.

The first three participants consisted of representatives from a consulting company who had various assignments (i.e., recruiter, director, consultant) and who used the general interface. The fourth participant was an engineer working in a well-known car manufacturing company who used the Kola system. The fifth participant was a statistician from an industrial company who used R and SAS systems.

Participants had varying IT knowledge and this is considered to be due to the roles and experiences they had. It also turned out that at least 3 of the 5 participants had a high level of education from a university or college (Master's degree or higher), which provided broader and more relevant information to the problem formulation.

Later in discussing the findings of the study, these five participants are indicated in the quotations by their roles. In order to not identify the research participants, they are titled as follows: Recruiter, Director, Consultant, Engineer, and Statistician.

3.3 Data collection: Interviews

In line with the selected theoretical framework, I chose interviewing that is widely used as a method for collecting data in qualitative research. I used semi-structured interviewing that consists of a set of predetermined open-ended questions to which the participants respond (Patton 2002). In this study, semi-structured interviews contained structured questions and thus provided detailed information explaining what problems the user of an interface may encounter and how the user's experience can contribute to the improvement of interfaces and work environment. It also represented an opportunity to find out several aspects of different approaches that users of interfaces assessed.

The interview represents a method in qualitative research. In this study the assessment of semi-structured interviews demonstrated several advantages. First of all, semi-structured interviews were designed to explain the possible problems that a user of any interface may experience regarding both the interface and the work environment. Second, semi-structured interviews provided explanations for possible solutions of problems a user may experience. Third, they helped to use a formal and structured protocol depending on the goals of the interviews. In the semi-structured interviews, the participant answers questions on the subject in previously defined and structured interview protocols (Patton 2002). The possible connection between questions and the subject may lead to further probing questions. The semi-structured interviews encourage mutual communication between the researcher and the participants and facilitate the discussion of sensitive issues (Recker 2013).

Interviews were structured in a way to address the research question of the study and to have the opportunity to collect more data from different perspectives (see Appendix A). In total five interviews were carried out with the five participants. Before the questioning, a brief explanation was carried out specifying the purpose of the interviews. All interviews were recorded according to the previously agreed consent for recording of the participants. The interview responses were transcribed and coded anonymously. According to Jacobsen (2017), an interview guide should be prepared in a way to ensure that the researcher emphasizes the important topics. In this study, an interview protocol was created to ensure that the research addressed important topics during the interview and to cover sufficient areas regarding how user experience could contribute to the improvement of interface and work environment. After preparing the interview guide I piloted the interview protocol with an informant in order to ensure that the questions followed a clear structure that covered the research area, that is the user experience regarding interface and work environments.

The participants of the study answered the questions, from their own perspectives, about the system they were using including its interface and the work environment (see Appendix A). The interview also included questions in relation to lighting, temperature, sound, fatigue and illness. These questions gave insights into workplace experiences that the employee has when working with a certain technical interface. These factors may contribute to differences in experiences when using the interface in different work environments. For example, lighting in the room or the number of employees working in the same room can lead to different experiences in different work environments. As the participants used different systems, I may have asked probing questions during the interview in relation to particular systems that they were using. Regarding the user experience it was expected that the interview would provide different perspectives in relation to the research questions of this study.

3.4 Data analysis

Thematic analysis was used in analyzing the data. According to Jacobsen (2017), the first phase of thematic analysis includes the analysis of collected empirical data and documentation of the results. Documentation can be done in the form of transcription. This research used the transcripts of the interviews as the main source of data. Documentation serves as a starting point for the second phase, where the researcher explores the content of data. In the first and second phase of analysis used in this research, clear patterns were shown from the participants. The participants mentioned, among other things, the UX, the systems they used most during working hours, the difficulty of finding information and the need to improve the work environment and the interface they used. The third phase of thematic analysis involves dividing the text into different phases or categories to reduce infinite information contained in qualitative data (Jacobsen 2017). This can be done by creating codes that represent unique meanings that arise from the participants' input. The last phase of analysis is interconnection, which includes the formulation of relations and connections between different codes in the effort to identify the themes of the study (Jacobsen 2017). Thematic analysis is in line with the theory of social constructionism as it draws from the participants' inputs to make interpretations and to construct meanings in relation to the questions asked (Recker 2013). Advantages of the performed thematic analysis is the possibility to apply the structured data in organizations on praxis and to manage them (Recker 2013). The main purpose of the report should be clarified with the help of the consistent themes. (Jacobsen 2017). This helps the researcher to focus on a number of themes instead of spreading efforts for the whole amount of data. Since the analysis is based on an interpretation of the collected material, there may be a risk that the interpretation does not correspond to the participant's reasoning (Recker 2013).

3.5 Limitations, reliability and validity

There are some limitations to the use of qualitative research. First, it is difficult to generalize the results to the larger population. Second, qualitative methods require appropriate skills and experience due to their interpretive nature that affects validity. This leads to subjective interpretation which may affect the whole research (Recker 2013). Third, at times during the interviews, the participant did not understand the question and answered irrelevantly to a specific question. It may happen due to shortcomings in the spoken language used for the interview or a foreign expression that required high technical knowledge in the specific area. Therefore, questions were formulated clearly to be easily understood. In this way, time was saved and more questions were processed preventing the interview from going in an unclear direction.

The above-mentioned limitations have implications for the validity and reliability of the study. In terms of validity, I needed to ensure that the research tool (i.e. interview) was asking what it was supposed to ask. In order to enhance the validity of my study, I used two strategies. First, I narrowed down the focus of my research, and thus the interview questions, on interface and work environment. Second, I used probing questions throughout the interviews in relation to the unique input that each participant was providing. This strategy helped to focus and delve deeper on the particular case of each participant.

In terms of reliability, I needed to assure that my analysis of the findings was consistent and reflective of the perspectives provided by the participants. In order to enhance reliability and to reduce bias, I conducted member checking meaning that I shared my analysis of the findings with the participants (Santos, Magalhães & da Silva 2017). I verified with them the extent to which my analysis truly reflected what they meant.

3.6 Ethical considerations

Ethical procedures were considered throughout the process of data collection and data analysis. First, the initial invitation letter informed the participants of their rights as research participants. Second, informed consent was sought with the participants of the study. This procedure informed the participants that their participation was voluntary, and that they could withdraw from the study at any point of time during the research process. They were also informed that their interview responses would be analyzed and synthesized in order to address the research questions of the study only and that any data that might allude to their identities would be removed or kept confidential. In order to respect and ensure the anonymity of the participants, any identifier including the names of the participants and the names of the companies where they were working were removed. Overall the participants were informed of the purpose, method, and the aim of the use of this research to alleviate the potential risks and negative effects. I assure that the current thesis shows no harm, risks, or conflicts of interest for both participants and the researcher.

Chapter 4: Results and discussion

This chapter consists of four main sections. The first section presents a summary of the findings based on the participants' responses to the interviews. The second section presents the thematic analysis of the study. It also uses the literature to discuss the themes. While the first section is informed by the research questions and the interview questions, the second section is driven from the data using theory and thematic analysis as a lens. The third section discusses the validity of the analyzed data.

4.1 Findings

This section presents a summary of the findings according to the data from the interview transcripts. The content of this section is organized into categories and sub-categories. These categories were determined according to the research questions of the study as well as the questions that were asked in the interviews.

4.1.1 Category one: Interface

The interview questions first asked the participants about their general knowledge about user experience as well as their own experience using the interface system in their workplace. These two key areas are discussed in the two following parts.

4.1.1.1 Sub-category: Knowledge of user experience

The interviews started with the question what a user experience was [see Appendix A]. The aim of this question was to find out how much knowledge the participants already had about the topic. According to the participants, User Experience related to the usability of a system or software, how easy understanding the system was and how long it took to perform an action in the system. In response to this question, the Consultant stated *"It's how simple the system is or how easy it is to use, how long it takes to perform something in the system."*

The participants often did not know much about the theory behind UX, but they responded in the same way that, for example, the system they used needed to be logically structured and to give the user the opportunity to influence its development in the future.

The second question addressed the importance of a good user experience and a user-friendly system. In this regard the Recruiter stated,

> *"It is the most important I would say, as all businesses are built around the business systems. So it is very important to have a business system that is easy to understand… it is very important that a system is as efficient as possible. As our task is to build, we usually talk a lot about building knowledge in the organization and in this aspect the business systems are very important. This is provided to be good, it will not be vulnerable for the organization when the employee stops working. But the system should be logically structured, a user should be able to use it by himself without having to ask for help. You should be able to come up with a solution yourself. Because it will be too difficult for our IT department who developed this system, if they build a complicated system, the work would be very complicated, it would not be so easy to understand it at all"*

According to this participant, the system must be logically structured enabling the user to use it by himself or herself without asking others for help. This structuring becomes particularly important once an employee leaves the organization and a new one enters.

The Engineer mentioned that the use of a user-friendly system needs to be easy and would not require a high level of knowledge. The user has to use it quickly and save a lot of time. Similarly, the Director stated that use of the efficient system saves precious time that results in efficient work.

The Statistician expressed a similar thought,

> *"To make the job more efficient and to not to waste time just understanding how this system works for an infinite number of hours. You can instead focus on learning the system and start using it as quickly as possible."*

According to the Statistician, the job is performed more efficiently through a user-friendly interface. The Consultant stated that a user-friendly system prevents the user from getting annoyed, and thus the user can quickly find an appropriate way to reach the optimal results.

Overall, the participants referred to logical structure, user friendliness and time efficiency as key factors that play a role in the interface.

4.1.1.2 Sub-category: User experience in practice

The third interview question asked about the systems each participant used in the workplace. The consulting company used a web-based system that had been developed by the company's IT department. The system contained all possible actions and processes. It was easy to understand and to work with. This system included 3 categories, namely clients, consultants and candidates. The company's general system was used to recruit candidates who were looking for work and for time reporting for all consultants who were recruited on an assignment for one month. All sensitive information such as salaries, invoices, customer information, consultant information and employment contracts were stored in this system.

The Engineer mentioned that different systems were used by her, but the one used mostly in her position was Kola. Kola is used to register various components contained in the company's system. Its task is to follow the development of components related to hardware, software, documents, drawings, KAD or 3D drawings. The Statistician used the systems R and SAS for statistical analyzes.

The fourth question asked how often each participant used the system. This issue was considered important as the interaction between users of the system could be quite long in cases. This approach also required a broader understanding of how the interface worked and how it impacted the user experience. All participants mentioned that they used their system constantly throughout the working day.

The fifth question of the interview asked how easy or difficult it was for a user to use the system for the first time, and how they judged the system after using it for a certain time. For the Recruiter, it was very easy to use their system. The Recruiter also mentioned that he had learned 50% of everything a user can do with this system.

> *"It is very easy to use the system. It is so comprehensive that I have learned 50% of everything you can do with the system. Some things I know well but other things I can*

not use so much. I think the placement of the elements in the system is good and I have not experienced anything strange with them. "

The Director mentioned that no help was needed to use the system even if the user had no previous experience in using it.

"There was no one to help me, I've just read and understood it, it was very easy. It is divided into different categories and subcategories, so that you can work without any education."

In the interview with the Director, it appeared that she had broader access to the IT system that enabled her to use it from different angles and to learn to use it with ease. It seemed that the leadership position of the Director had given her legitimacy to such access that otherwise she would have not had.

For the Consultant, the use of the system was unclear and difficult at the beginning when he started his work in the company, but then he received sufficient information on how to use it. He said,

> *"The first day I started using it, it was a bit unclear, but then after a little help from the staff manager, I almost understood how to use it. At the moment, it is very easy...Now I have gotten used to this system after a long time but have to say it is not difficult but there is room for improvement, you just need to learn."*

The Engineer mentioned that the Kola system was used quite often because she worked with development where information was needed. This information is about a system, subsystem or components to which the user has access by logging into Kola. In addition to the mentioned information, there is more information that a project manager or component owner needs to find.

The Statistician stated, *"Some features require you to open the manual and search for information on how to use them."* It seemed that the Statistician experienced difficulties regarding the systems he used in the workplace and that sometimes it was difficult to use them due to functions that required additional knowledge which he drew from the system manual.

The sixth question asked whether the interfaces used by the participants needed to be improved in terms of the color, the size of buttons and the placement of different elements.

The Recruiter was satisfied with the interface and considered that there was nothing strange about using the system. According to the Recruiter the employees had the opportunity to make suggestions on how the system should be developed in the future. This was possible by notifying the consulting company's IT department in case any issue regarding interface or functionality was found by the employees.

The Director, who was using the same system, was not as satisfied with it and said,

> *"I click somewhere or go different ways, I come to the same information. Everything you are looking for can go through different paths and it can be very difficult. It is*

also not mobile-friendly that's why the IT department is planning to create an app to facilitate the use of the system via mobile telephone."

According to the Director, navigation to the same page when she would search for information in the system, was difficult to use. Searching for information also needed different paths in the system.

Similarly, the Consultant mentioned that the interface was not mobile-friendly,

"I find it difficult to log in to the system and use it when using the mobile phone as you need to zoom in to be able to read the information. A mobile-adapted system or application would be good in this case. "

During the interview with the Engineer, it was also noticed that she experienced difficulties when using the Kola system. After logging in to the system and searching for information about a specific part number of a component, the page sometimes disappeared when the user wanted to search for a new part number.

"One thing I have in my mind is for example when you are going to check to search for part numbers, and then you want to keep the window you want with all the information, then if you want to search for a new part number, all the information you have found in part number 1 disappears. So to keep the information you found, you need to reopen and check again. It's a trick I use but it's not that smart I think. So I wish you could search for different part numbers at the same time on one application without having to open the app again instead of having two apps open at the same time."

The Engineer said that eventually she found a solution herself by reopening the application without changing the previous search.

Another issue that the Engineer found difficult with Kola was the excessive number of words and jargons the meaning of which the user does not know.

"Another thing that is difficult to check is that there are lots of words that you do not know the meaning of, but I think it is because you need to learn more to be able to use Kola."

The Engineer mentioned that more knowledge was needed in order to use the advanced features of the Kola system.

The Engineer mentioned that although there are errors and technical difficulties in the software, there can always be a reason for improvement.

"One thing that is usually done regularly in our company is that those who develop our systems send emails and ask what it is like to use the newly developed system and we can submit our comments in writing. Sometimes they also send out questionnaires about a developed system that we can answer. "

The Statistician mentioned a problem with small screens where the software did not work and therefore the user needed to connect the computer to a larger screen to be able to use the program.

> *"It often happens that I want to go to a meeting where I need to bring my laptop with me while the software is running. I disconnect it from the big screen I use and everything just suddenly stops working, so the only way is to use it in a bigger screen."*

Overall, it appeared that accessing the interface and using the system was a highly personalized experience. Each participant had their own unique ways of learning about the system that they were using. Furthermore, when faced with problems, rather than looking to fix the system, they opted to find a way that quickly responded to their needs in a unique and personalized manner.

4.1.2 Category two: Work Environment

The last and seventh question asked during the interviews included work environment issues. It asked how the participants experienced the use of each system during the working day and in the work environment. It also asked which factors made it difficult to interact with a system in addition to the obstacles the users experienced at work. These factors included lighting, temperature, sound, fatigue and illness.

The Recruiter replied that working conditions were good in general, but it was the interface that had some difficulties. He stated, for example, at times too much information about consultants was collected in the same page that made the page messy, and that made it difficult for the user to follow especially when he is tired at the end of the working day. According to the Recruiter, the information was well organized, but sometimes scheduling consultants was time-consuming and a lot of attention was required from an administrative perspective. On the other hand, the physical work environment itself was not perceived as messy.

The Director stated that she did not have any complaints about the work environment. She further mentioned that the consulting company's system was very flexible and because it was web-based, there was an opportunity to work from home or anywhere else. Moreover, she stated that as a user of the system, it can be difficult to interact with the system due to fatigue or illness. She said that she had the same experiences when she compared it with the systems she had previously worked with. According to the Director, the information in the previous systems always needed to be verified but in the current system everything is organized and the user does not do any extra work.

> *"It is a very flexible system because it is web-based and I can work from home, out and wherever I am. It makes it easier as you can save a lot of time without being stressed when it is one integrated system. There's nothing I really have to complain about. Compared to other systems that I have worked with before, when you needed to double check that if all information is correct. We have what we need in the work environment. But if you are tired or have a headache, it can be difficult to work."*

The Consultant stated that he experienced a messy work environment that led to stress and affected the use of the system when measuring data, but the consulting company's system was mostly used at home where nothing happened that hindered the use in a suitable way.

> *"As a consultant, I use this system wherever I am and I mostly use it when I'm at home and nothing bothers me. But in the workplace, the use of computers with technical systems is sometimes difficult because we sometimes sit in a messy workplace where different activity happens all the time. You should have your laptop in your hand and look at the screen. It makes you feel stressed if urgent matters arise. So I think that if*

there is a lot of work at once, you can lose focus and sometimes measure the wrong data in the system. "

None of the participants from the consulting company had experienced problems with lighting, temperature and sound. However, it seemed that the Engineer experienced problems with loud noise. She said that sometimes it became difficult to focus because she worked in an open work environment where people came and went and talked. She also mentioned that there was a restaurant inside the workplace that had caused odors of burnt food or onions in the morning.

It turned out that the Statistician also had problems with disturbing noises in the workplace. To alleviate this problem, a quiet work room can be used by the Statistician and others as needed.

> *"It bothers me a lot when my colleagues talk loudly or laugh all the time. That's why I often go and sit in the quiet room. It happens that I have had bad sleep the night before I come to work so I go and sit there. It is a large quiet room where 5 people can sit in peace and quiet."*

In addition, the Statistician also mentioned a problem that he believes can return to both software and work environment problems.

> *"There is a problem with our system's server, when you are connected to the server and using the application, the main company's server gets disconnected and the application stops working, which depends on the work environment"*

The participants were asked if they engaged the specialist or their company director in order to solve the problem. The Statistician replied that he did not. He said, *"No, I did not tell them but I was content to drive with it as it is, they probably know about it but they have not done anything about it."* He also stated that the company was certainly aware of this problem because the problem had existed before.

4.2 Thematic analysis of the findings

Four key themes emerged from the participants' responses to the interview questions.

4.2.1 Theme one: There was a phase in which users learned and adapted to the interface.

The analysis of the transcripts revealed that, when using an interface for the first time, the participants went through a phase in which they had to learn and to adapt to the interface in their own unique ways. This was evident from the way in which participants responded to question five that had asked how easy or difficult it was for a user to use the system for the first time. The Statistician spent time reading the manual. The engineer asked colleagues for help. These differences may be explained by the fact that each participant was using a different system and that those system differences may have contributed to their varying experiences in learning and adapting to the system.

4.2.2 Theme two: Different experiences according to roles

The first theme discussed the fact that each user went through her or his own unique phase in learning and adapting to the system. A related theme that emerged from the data suggests that these experiences varied according to the roles that each user played. This point was demonstrated by the perspectives that the users from the consulting company shared in their responses to question five. For the Recruiter, knowing 50% of the content was sufficient given the role that he was playing and the tasks that he had to accomplish, while the director had full understanding of the system because her role required her to have an overall bird's eye view on how the system worked. The participants' answers to the interview questions demonstrated that the experiences, once the system is used at work, accord with the position of the user. The person who handles the administrative and recruitment process in the web-based system does not have access to the same functions as the person who internally schedules and books consultants for various assignments. This means that each role in this system has its own privilege in the kinds of functions that they can use.

Role and position in the organization is linked to the concept of legitimate peripheral participation (Lave & Wenger 1991). According to this concept, all individuals who work in the same organization, do not necessarily have equal access to resources and to opportunities for advancement (Wenger 1998). The individuals who are not in a senior position or who are new to the community may or may not be granted legitimacy to participate fully in the workings of the community (Lave & Wenger 1991). As stated in the interviews, the Recruiter and the Director found the system easy to use whereas for the Consultant the system was unclear. It seemed that the Recruiter and the Director had a different form of access to the system, a kind of access that was not immediately available to the Consultant. The Consultant, the Engineer, and the Statistician had to refer to other resources such as asking their colleagues or reading the manual to resolve the problems that they were accessing; this form of participation might indicate their peripheral (Lave & Wenger 1991) position in their organization.

4.2.3 Theme three: problems to the interface above and beyond other factors

A prominent theme that emerged from the interviews was that several of the problems experienced were inherent to the interfaces themselves than any other external factor. While the participants did mention physical workplace problems such as noise or food odor, problems inherent to the interface were more prominent throughout the interviews. Two of the participants mentioned the interfaces they used were not adaptable to mobile systems. The Engineer talked about the problem of disappearing pages on the Kola system. Another problem she mentioned was the excessive use of specialized jargon on the interface that made understanding difficult. The Recruiter talked about the disorganized way in which information was shown on the consultants' page.

These problems are linked to the pleasure and joy of using interfaces (e.g., See-To, Papagiannidis & Cho 2012). Enjoyment and connection of the user is enhanced by having an interface where the user pays attention to the displayed information without interruption, which creates a good user experience (See-To, Papagiannidis & Cho 2012). This issue was reflected in the experience of the Statistician who experienced the problem of connecting desktops to small screens. The Statistician experienced an interruption of the software after disconnecting the HDMI cable from his laptop, which can be a hardware error which is part of the interface as a whole.

The analysis of the interview transcripts found that the problems inherent to the interface had an impact above and beyond any other factor that might have influenced the user experiences. This is linked to the concept of the digital work environment, the improvement of which enhances user experience and prevents problems such as cognitive load (Sandblad et al. 2018). The cognitive load emanating from the work environment prevents the user from using the system efficiently and contributes to reduced productivity (Sandblad et al. 2003). Despite the skill of the user and the usability of the interface, it turns out that the cognitive work environment can still reduce productivity by interrupting the user's interaction.

4.2.4 Theme four: IT literacy as part of the solution

The participants of the study mentioned that in order to solve the interface problem, their companies would bring in specialists. However it seemed that, in addition to referring to an expert, sometimes the users were autonomous in finding their own particular ways to solve the problems. For example, when talking about the problem of pages disappearing on her, the Engineer said that eventually she found a solution herself by reopening the application without changing the previous search. Similarly, the Statistician mentioned that he did not refer to the specialists and instead tried to work with the system using his own skills. It seems that it took some technology literacy or adeptness on the part of the users to address and solve the problem.

Users of an IT system examine the system and the interface based on their own perception, and it is also notable that an ordinary user does not have much knowledge of the user experience (Sandblad et al. 2018). However an ordinary user is aware of what hinders them from interacting with an interface. This is related to the concept of human capital in terms of education and literacy levels of the user (Mellander et al. 2001). In the analyzed results, it was noticed that participants with high levels of education were more IT-skilled and their experience could be a contribution to the improvement of IT systems and interfaces. For example, the Engineer had a background in a specific software for component development that helped her navigate her way through the system. A productivity paradox emerges through the implementation of a computer system with low usability and low focus on human capital in the organization. In other words, productivity is increased with both useful systems and highly trained users (Sandblad et al. 2003).

4.3 Validity of the findings and themes

As discussed earlier in Chapter 3, I used member checking to verify the findings from the study and to validate the themes that I drew from the analysis. In doing so, I had a follow-up conversation with the participants and verified the extent to which my findings and conclusions reflected their voice and what they had intended to say. The participants approved and verified the majority of the findings and conclusions that I had reached. I made sure to take into consideration the points that they elaborated and added insights to what they had shared before.

Chapter 5: Conclusion

This study aimed at finding an answer to address problems concerning interaction with an interface caused by the interface and work environment. By studying user experiences from different perspectives I sought to examine the user's mindset and behavior in resolving interaction problems caused by digital interfaces and the work environment. The methods of data collection and analysis of the data were inspired by social constructionism and interpretivism in order to help me find related answers to research questions. Using a qualitative method of inquiry, semi-structured interviews were selected as the method for data collection. Given the context of the pandemic, the interviews were the only method of data collection and they were conducted remotely.

The transcripts from the interviews were used as data and analyzed. The process led to thematic analysis of the findings. The analysis of the interview transcripts identified four themes. The first theme highlighted the fact that users went through a phase in which they learned and adapted to the interface in their own unique ways. Second theme pointed to the importance of the role each interviewee played in the company in shaping their experience using the system. The third theme revealed that the problems inherent in the interface had a significant influence in the user experiences. The fourth theme highlighted the importance of IT literacy of each employee in order to manage the interface interaction problems on their own. This chapter consists of two sections. First, it brings together and discusses the conclusions using the literature. It then presents the suggestions for future research.

5.1 Discussion of the conclusions

The study showed that users of IT system adapt to the user interface and work environment in various interaction conditions. This means that there is often a solution found by the user to make the interaction with an interface easier. The results also show that negative experiences are more linked to the use of the interface and the IT system in comparison with work environment negative experiences.

How easily the user can find information and interact with the interface and how appropriate the work environment is can be used as a measure for reviewing and generating a satisfactory user experience. Allowing users of interfaces to take part in the development is a positive sign and a factor that determines how much an organization or a company enables user involvement. This has the aim of not only running a business system but taking into account how the employees experience the use of the system. This is consistent with previous research showing that user stories help to better understand the user's experience and capture the context of the individual (Millard et al. 2013).

There are reasons why some employees in a company may refuse to be actively involved in the development of IT systems. One reason is considered to be lack of encouragement on the part of the company or organization in motivating its staff to take part in the development. This is linked to the concept of legitimate peripheral participation discussed earlier (Lave & Wenger 1991). The staff may not be granted sufficient legitimacy to take part in improving the system that they use . The second reason is the employees who, for various reasons, choose not to contribute to the development and improvement of the IT systems. Individuals have different dispositions and behave and react to situations differently (Johansson et al. 2018).

The user's role and level of participation in the workplace is an important factor that distinguishes an ordinary user from an advanced one. This means that a user who has a greater freedom to perform various tasks has a broader experience compared to a regular user with a number of limited permissions to perform certain tasks (Lave & Wenger 1991). The privilege gives the user an opportunity to find more IT-system failures and by this way make the user aware of what is wrong in the system and how it can be improved. This was the case with the Engineer who ran many tasks and could access almost different system areas that regular employees were restricted to enter or use.

The digital work environment is another important factor in user experiences. A user-friendly system and a good UX design help to understand how the organization's activities are connected to the system that is running in a logical and efficient way. In the case of the consulting company, the interface facilitated the user experience by having all services in one system. This means that no other system or software was needed to perform additional actions and all employees at the company have the opportunity to work more appropriately in each role. An easy-to-understand interface helps the user find the solution on their own without having to go ahead and look for colleagues and ask them for help. Through a user-friendly system, the work is done more efficiently and faster from a time perspective (Sandblad et al. 2018).

It turns out that there is no ideal system that creates a good user experience and that each individual who uses the system has their own opinion regarding whether something works well or not. Despite the fact that interfaces in various industries are continuously developing, small design errors or incomprehensible events in the system are inevitable. In these situations, the user has the opportunity to find the solution independently. This was the case with the Engineer where she experienced difficulties and had to seek solutions while she was using the system. Being able to find a solution for using different systems is always good but does not hide the error or a bug that may be present in the application.

In terms of user's education it turned out that education in the IT field plays a significant role in understanding IT systems and user experience in general. That's because advanced IT systems used by educated people lead to IT growth within an organisation. Educated users have broader understanding about any lack of system functions and user experience as they may also use several systems on a daily basis (Mellander et al. 2001). This IT growth can basically be system improvements by functions or user interface.

5.2 Suggestion for future research

The COVID-19 pandemic affected the entire world and this study was no exception. What could have greatly contributed to this study was the observation method (Jacobsen 2017) for observing the users of interfaces in different work environments. In order to explore and gain a broader understanding of the problems people face when using information technology systems, the use of the observation method is recommended in addition to the method used in the present study.

A further suggestion for future research is to examine user experiences based on the user's level of technology literacy. The results of this study was drawn from a sample of participants with a high level of education and IT knowledge who used advanced interfaces and who encountered more and broader information about possible problems with work environment and interface design. Future research may consist of comparison studies to understand how users with different levels of IT literacy encounter and address problems related to interfaces.

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Appendix A

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Interview questions

1. Do you know anything about user experience?

2. Why do you think it is important to have a good and user-friendly system?

3. What is the name of the system you use at your workplace and what is this system used for?

4. How often do you use this system if it is not just a system that the company where you work uses?

5. How does it feel to use the system from a interface perspective, is it easy or difficult?

6. Is there anything about the interface that you think should be improved, such as the color, size of buttons, grouping of buttons or something else?

7. Is there anything in the work environment that you find difficult to interact with the system during the working day? For example, lighting, temperature, etc.?

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University of Borås is a modern university in the city center. We give education programs and courses in business administration and informatics, library and information science, fashion and textiles, behavioral sciences and teacher education, engineering and health sciences.

At the **Department of Information Technology,** we have focused on the students' future needs. Therefore, we have created programs in which employability is a key word. Subject integration, wholeness and contextualization are other important concepts. The department has a closeness, both between students and teachers as well as between industry and education.

Our **courses and programs** with a major in informatics are centered around basic concepts as system development and business development. In our wide range of specializations there is everything from programming advanced systems, analyze the needs and requirements of businesses, to conduct integrated IT and business development, with the common purpose of promoting good use of IT in enterprises and organizations.

The department is carrying out IT-related **research** within the university's research area called Business and IT. In terms of field, the research activities are mainly within **computer and systems science**. Particular areas of focus are **data science** and **information systems science**. Both scientifically and professionally-oriented research are performed, which among other things is manifested through that research is often conducted based on domain specific needs of business and government organizations at local, national and international arena. The professionally-oriented research is also often manifested through our participation in the Swedish Institute for Innovative Retailing (SIIR), which is a research center at the University with the aim of contributing to commerce and society with the development of innovative and sustainable trade.

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