



Developing and Measuring User Experience in a Self-help Portal Case: Mid-sized Consumer Electronics and Instruments Company

Miia Tiira

2019 Laurea



Laurea-ammattikorkeakoulu

**Developing and Measuring User Experience
in a Self-help Portal Case: Mid-sized Con-
sumer Electronics and Instruments Company**

Miia Tiira
Degree Programme in Innovative
Digital Services of the Future
Master's Thesis
June, 2019

Miia Tiira

Developing and Measuring User Experience in a Self-help Portal Case: Mid-sized Consumer Electronics and Instruments Company

Vuosi

2019

Sivumäärä

67

Käyttäjäkeskeinen suunnittelu on tullut osaksi palvelusuunnittelua yhä vahvemmin palvelujen digitalisaation kautta. Digitalisaatio on tuonut asiakkaille mahdollisuuden valita palveluntuottajansa maailmanlaajuisesta tarjonnasta. Käyttäjien ymmärtäminen ja palvelujen suunnittelu heidän kanssaan onkin välttämättömyys kansainvälisellä kilpailukentällä.

Tämän opinnäytetyön tarkoitus oli ymmärtää toimeksiantajayrityksen digitaalisen itsepalveluportaalin käyttäjäkokemuksen taso. Työn tavoitteena oli tuottaa ehdotuksia kokonaisvaltaisesti itsepalveluportaalin käyttäjäkokemuksen parantamiseksi sekä sen käyttäjäkokemuksen mittaamiseksi. Toimeksiantajana tälle opinnäytetyölle toimii yritys, joka toimii kuluttaja-elektroniikan ja instrumenttien parissa.

Opinnäytetyön teoreettinen viitekehys koostuu ihmisen ja tietokoneen vuorovaikutuksen näkökulmasta, käyttäjäkeskeisestä suunnittelusta sekä käyttäjäkokemuksesta. Käyttäjäkokemusta käsiteltiin tarkemmin pureutumalla sen neljään osa-alueeseen; informaatioarkkitehtuuriin, interaktiosuunnitteluun, käytettävyyteen sekä identiteettisuunnitteluun. Työn teoreettinen osuus pyrkii vastaamaan siihen mitä käyttäjäkokemus sisältää.

Työ on toteutettu tapaustutkimuksena. Opinnäytetyössä on käytetty menetelminä käytettävyydestä, käyttäjäpolun määrittämistä, käyttäjäpersoonien luomista sekä palvelun tavoitteiden määrittämistä työpajassa. Käytettävyydestä toteutettiin neljällä testajaalla, jotka vastasivat yhtä käyttäjäpersoonista. Käyttäjäpolku määritettiin käyttäjätestauksen yhteydessä yhdestä testitapauksesta. Palvelun tavoitteita määrittävään työpajaan osallistui kaksi toimeksiantoyrityksen edustajaa. Työn tuloksena tuotettiin kolme käyttäjäpersoonaa, yksi käyttäjäpolku, käytettävyydestä tulokset sekä ymmärrys palvelun käyttäjäkokemuksesta.

Kehittämiskohteiksi nousi sivuston hakutoiminnon kehittäminen, sisällön ajantasaisena pitäminen, käyttäjäpolkujen parantaminen ja käytettävyydestä lisäminen. Sivuston käyttäjäkokemus oli kokonaisuudessaan kehittämistä vaativa. Työn tuotoksena tuotettiin ehdotukset käyttäjäkokemuksen parantamiseksi sekä käyttäjäkokemuksen mittaamiseksi.

Asiasanat: käyttökokemus, käytettävyys, interaktiosuunnittelu, informaatioarkkitehtuuri, käyttäjäkeskeinen suunnittelu

Miia Tiira

Developing and Measuring User Experience in a Self-help Portal Case: Mid-Sized Consumer Electronics and Instruments Company

Year 2019

Pages

67

User-Centred Design has become more and more relevant for service design in the digital age. Digitalization has brought customers the possibility to choose their service providers from a global offering. Understanding users and designing services with the users have become necessities in order to survive in the global competition.

The purpose of this thesis is to understand the current User Experience within the commissioning company's digital self-help portal. The objective was to produce suggestions on how the overall User Experience could be improved and suggestions on how User Experience could be measured. This thesis was commissioned by a company that operates in the consumer electronics and instruments business.

The theoretical framework consists of Human-Computer Interaction, User-Centred Design and User Experience. User Experience is discussed in more detail through its four elements: information architecture, interaction design, usability and identity design. The theoretical part aims at defining what User Experience comprises.

Case study research was chosen as the approach in this thesis. The methodology used in this thesis consists of usability testing, defining a user journey, creating user personas and defining the goals for the self-help portal in a workshop. The usability testing was completed with four testers who resembled one of the user personas. The user journey was defined during the usability testing using one of the usability tasks. Two company X representatives participated in the workshop for defining the service goals. The main outcome for this thesis was three user personas, one user journey map, usability test results and overall understanding of the service's User Experience.

Developing the search function of the website, keeping the content relevant, improving user journeys and increasing the amount of usability testing were highlighted as a further development need. Overall the results showed that the User Experience of the website requires development. As a result of this thesis suggestions were created for improving the User Experience and for measuring it.

Keywords: User Experience, usability, interaction design, information architecture, User-Centred Design

Contents

1	Introduction	6
1.1	Purpose and objective of the thesis	6
1.2	Case Company	7
2	Theoretical framework	8
2.1	Human-Computer Interaction's effect on User Experience development	8
2.2	User-Centred Design in digital services	9
2.3	Understanding and developing User Experience for a digital service	13
2.3.1	Brand as an influencer to user expectations and service identity	16
2.3.2	Creating information architecture for a website	19
2.3.3	Designing interaction for a website	22
2.3.4	Usability in website development	23
2.3.5	Measuring website User Experience	28
2.4	Developing self-help portal user experience	30
3	Methodology	30
3.1	Case study research	31
3.2	Plan	32
3.3	Design	32
3.4	Prepare & Collect	33
3.4.1	Creating user personas with interviews	34
3.4.2	Website usability testing	37
3.4.3	Mapping a user journey	40
3.4.4	Customer feedback and data	41
3.5	Analyze & Share	41
4	Results	44
4.1	Opportunity of the self-help portal	44
4.2	Self-help portal user personas	46
4.3	Usability	51
4.4	User journey map	54
4.5	Suggestions for improving and measuring user experience	55
5	Assessment	58
5.1	Assessment of the development work	58
5.2	Recommendations and conclusion	60
	References	62
	Figures	67

1 Introduction

The way websites are designed has changed globally since the start of website design in the 1990's. The focus in design in the beginning was brand-centred. The most important aspect was to ensure that the visual details on the website reflected the brand. In many cases, this also meant that one company might have had several websites, each dedicated for just one brand. User research was not part of website design, as brand building for many companies had nothing to do with the actual users of the website. Companies saw themselves as the experts. (Kuniavsky 2003, 3-4; Dawson 2012, 2-3.)

The world of website design has since changed from brand-centred to user-centred. Digitalization has enabled global competition between companies, which has meant that companies have had to start listening to what customers and users want, when planning their products and services to fulfil customer needs. Companies have understood that their website and other digital products and services need to be user-centred for them to survive in the global competition. (Goodman et al. 2012, 3-4; Kraft 2014, xv.)

For companies to be user-centred they have started to include user research in website design. Some companies have gone even further and applied the philosophy of User-Centred Design. These companies have understood that User Experience is an integral part of brand building. User Experience takes into consideration technical as well as emotional aspects. It includes not only the product that the consumer buys, but the services that the company provides with it. (Kraft 2014, xv.)

Even though many companies have become more user-centred in their website design, for many companies understanding and implementing User Experience is still new. User Experience always includes interaction between a user and a product or a service, which can be observed and measured (Tullis & Albert 2013, 4-5). User Experience is also something that should be regularly improved.

1.1 Purpose and objective of the thesis

The purpose of this thesis is to understand the current User Experience within company X's digital self-help portal.

The objective of the thesis is to produce suggestions on how overall User Experience could be improved and suggestions on how User Experience could be measured.

To support the objective four supporting questions are used:

What does User Experience contain?

What are the issues with the self-help portal User Experience currently?

Who are the users of the self-help portal?

What kind of metrics can be used to measure User Experience?

1.2 Case Company

The case company will be referred to as company X in this thesis. The company operates in the consumer electronics and instruments business. The company has been founded in the 1930s in Finland and its headquarters is still located in Finland. The company employs around 400 people around the world. It sells its products globally. Products are sold via retailers and through the company's own online store.

Company X's website includes an online store, product information pages, community pages, a repair service section and the self-help portal. The self-help portal on the company's website is owned by the company's customer support team. The company's marketing department, which is also located in the company's headquarters, is responsible for the visual image of the self-help portal as well as the technical development and implementation of the portal. The marketing team is also responsible for the overall brand image of the whole website.

The self-help portal, even though owned by the customer support team, is important to several functions in the company. Content for the self-help portal is created by the headquarter customer support team but it is often done in co-operation with the marketing team, brand managers, repair services or customer support agents. The marketing team brings information about issues that have risen from consumers and which can then be tackled with articles on the portal. Repair services contribute with information about reoccurring issues with the devices, these can be solved with troubleshooting steps that are made available for the consumers in the portal. Brand managers are the experts of their own products and can share information about more specific issues or matters that they are seeing appear regularly. Customer support agents, who are located around the world, contribute by writing content, as they have the first-hand information about the reasons for customer contacts. The headquarters customer support team also follows customer data to improve the portal.

A self-help portal aims at providing customers an easy access to product related troubleshooting material, user guides, how-to videos and other information that would normally be provided by customer service agents when customers contact them. The main goal of a self-help portal is for the customers to easily and independently solve their own issues. This frees time and costs from the customer service, as the number of contacts will decrease.

A well-managed self-help portal is easy for the user to learn to use, which will in many cases make the customer return to the portal to look for solutions. A self-help portal is part of the

overall service that a customer buys when purchasing a product. It is therefore also an important part of building the company's brand image. In company X's case the portal is part of the main company website and for a customer they are one and the same, even though internally the portal and other parts of the website are managed by different teams.

2 Theoretical framework

This chapter describes the concept of Human-Computer Interaction (HCI) as the high-level framework for this thesis. User-Centred Design (UCD) and User Experience (UX) are introduced and explained as they lay the main framework for the development in this thesis. The topics of identity design, information architecture, interaction design, usability and User Experience metrics are discussed as the main features of User Experience. The topics of user expectations and user value are also described.

2.1 Human-Computer Interaction's effect on User Experience development

The early computers in the 1950s were not developed to meet the needs of wider user audiences, as they were managed by a limited number of specialists (Helander et al. 1997, 11). User interfaces for these computers were planned merely to satisfy the needs of these specialists (Silver 2005, 7-8). In the 1980's computers developed to be a commodity for anyone to buy. This change brought with it the need to understand computer users, usability and human interaction. In today's world, the amount of interaction between humans and computer systems is constantly increasing. Mobile phones serve as a great example, as they have become a fundamental part of our everyday lives, instead of serving just for communication purposes as they did in the beginning. Today we interact with the information system of the mobile phone, as well as a multitude of applications within it. We also interact with different websites through different devices. (Helander et al. 1997, 11; Shneiderman& Plaisant 2010, 4-5; MacKenzie 2010, 1.)

The design science of Human-Computer Interaction emerged from the need to better understand the connection between computer technology and its design in relation to human interaction. Human-Computer Interaction has its roots in combining the methodology from cognitive and experimental psychology with tools from computer science. Later it has encompassed aspects from areas such as instructional design, human ergonomics, information architecture, social sciences and many more fields. (Shneiderman& Plaisant 2010, 4-5; MacKenzie 2010, 2-3.)

User interface is defined by ISO standard (9241-210) as the "components of an interactive system that provide information and controls for the user to accomplish specific tasks with the interactive system". In a digital service, such a self-help portal, the user interface is the website design including the visual aspects such as buttons and icons that enable the user to interact with it. HCI research focuses on understanding the ways to develop user interfaces to

be of good quality, effective and efficient (Silver 2005, 7-8; MacKenzie 2010, 24). To make the interface enjoyable for the user to use. User interface design is an interest for many companies, as it directly affects the User Experience of digital services. (Shneiderman & Plaisant 2010, 6-7.)

The challenge in today's world for digital services is that they are, in most cases, accessible for any user anywhere in the world. EU Web Accessibility Directive (2016/2102/EU) dictates that digital services within the EU area need to be accessible to everyone, including people with different disabilities. This means changes in user interfaces to meet diverse needs. As for now the directive is only intended for the public sector but might bring with it the need for the private sector to follow in suit. The user interface needs to serve different needs, support a variety of devices and satisfy different types of users. Understanding usability is essential in developing user interfaces to meet these needs. Usability is defined by ISO (9241-210) as the "extent to which as system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use". Usability contains the technical aspects needed to make the interface not only look good but work to its users' needs. It ensures the quality of the digital service (Silver 2005, 9).

In the context of a self-help portal, Human-Computer Interaction focuses on understanding the design of the website, evaluating and implementing it (Hewett et al. 2009). All of these aspects affect the User Experience of the self-help portal and are essential in developing it. Understanding human needs and developing usability and user interfaces based on it is the basis for Human-Computer Interaction (Silver 2005, 9). User-Centred Design aims at understanding these human factors and is one of the development philosophies of HCI. User-Centred Design will be described in more detail in the next chapter.

2.2 User-Centred Design in digital services

Every product and service has included design when it was developed, but the method of design varies depending on the object. Design can be implemented by companies consciously or unconsciously. This means that in some cases design happens only as part of the development and not as a planned process. Products and services can have a variety of different design aspects that need to be considered when following a design process, such as industrial, experience or interaction design. In digital services, such as in a self-help portal, the areas of experience and interaction are often the focus of design. (Norman 2013, 3-8.)

As technology develops and brings new possibilities to digitalizing services, it also brings along global competition. There is a need for companies to ensure that their design practices enable them to respond to this by creating competitive services. For the design to follow in suit with the technological, as well as consumer related changes, the focus in designing digital

services should be in understanding and meeting the user's needs. To do this, the development process should be based on Human-Centred Design (HCD), for interactive digital services more specifically User-Centred Design (UCD). (Norman 2013, 8-9; Lowdermilk 2013, 5.)

UCD is described by ISO standard (9241-210) as an approach used in improving interactive system usability by concentrating on human factors and applying understanding and techniques of usability (ISO 9241-210). According to Norman (2013, 8-9) UCD aims at understanding human needs, before any solutions are created. Meeting those human needs is the goal of the design process. User-Centred Design is synonymous to Human-Centred Design, but it focuses on users of a specific system. User-Centred Design has emerged from Human-Computer Interaction, from the need to create user interfaces to reflect user requirements. (Lowdermilk 2013, 5-6.)

Norman (2013, 8-9) argues that User-Centred Design is a design philosophy, rather than methodology. Norman (2013, 8) proposes that User-Centred Design is the overarching philosophy whereas experience design, industrial design and interaction designs are the areas of focus in the development. User-Centred Design is therefore always reflected upon, but there is no set process to implementing it. Still & Crane (2017) challenge Norman's argument by proposing that it is not enough to have UCD as a high-level philosophy in organisations. They state that a clear UCD process is required so that UCD will truly be practised in organisations.

Cooper et al. (2014, 6-7) state that digital services often fail due to four reasons: user needs are not taken into consideration, priorities are not clear for the development team or management, conflict of interest when the same team is designing as well as building User Experience and overall lack of design process and collection of user data. Lowdermilk (2013, 5) also emphasizes that in many cases the user-centred approach is missing, and decisions are made according to the developers own preferences and assumptions of the user.

Taking the user's needs into consideration and even to the centre of the design process is often forgotten in designing the interaction in digital services and in technology in a larger scale. Majority of technology is created based on a company's customer segments and background information about those customers. This gives a good overview of the customer, but it does not give information on how the customers as users behave. It doesn't tell about their actual interaction with the service or product. (Shneiderman & Plaisant 2010, 118-119; Cooper et al. 2014, 8-9.)

When a digital service is managed by several departments this can lead to unclear priorities. In the case of a website, an organisations marketing team normally plays a role in running and developing it. From a marketing point of view, it is important that a website is fit for the market, the brand and positions the products correctly. It is aimed at fulfilling requirements to beat the competition. The user is often forgotten in this viewpoint. Some requirements for

the service might be based on market surveys, which can give insight into what the users say they want from the website, but in many instances can lack the actual user needs. (Cooper et al. 2014, 7-8.)

The technical development team that is responsible for the actual implementation of the requirements to the website often does not participate in the design or requirement setting. This is problematic, as the developers are the ones with the technical expertise and understanding for implementing the design. Even more often the developers are not given and do not have information about the needs of the users. When the developers only participate in the last stages, they will set priorities for the requirements based on their own understanding, which can be irrelevant from the user's perspective. (Lowdermilk 2013, 8-12; Cooper et al. 2014, 7-8.)

When UCD is implemented efficiently for a self-help portal it has the potential of increasing efficiency for the users as well as the organisation, making the portal easier to use and thus reducing costs for the support team, improving User Experience and improving brand image and increasing usability. In order to do this, users need to be involved throughout the design process, the development should be done iteratively, and all aspects of User Experience should be looked at. Most importantly the design decisions should be done based on collected user data. (ISO 9241-210; Lowdermilk 2013, 8-10.)

As Still & Crane (2017) argued, implementing UCD requires a clear process that is visible and implemented through the organisation. Each team that is involved with the digital service should follow the same process and the design practise should be followed in every step of the services lifecycle. This requires identifying responsible persons in the organisation and choosing appropriate methodology for implementation. The involved teams should define the procedure for collecting and giving feedback and setting and following milestones. Timetables should be defined for implementing possible changes and running iteration cycles. Defining these aspects leads to a unified understanding of the design process and helps in the overall project planning. (ISO 9241-210.)

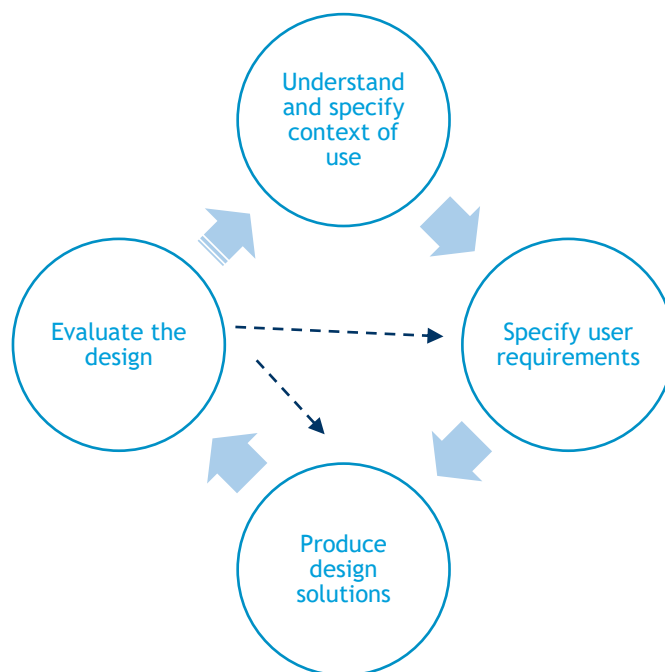


Figure 1 Human-centred design activities (ISO 9241-210)

ISO (9241-210) specifies four aspects for implementing UCD (Figure 1). These are understanding and specifying the context of use, specifying user requirements, producing design solutions and evaluating the design. Each of these steps requires an allocated resource from the organisation. Possible changes in the resourcing needs to be considered in the overall project planning (ISO 9241-210). Due to the scope of this thesis the aspect of evaluating new design solutions has been left out of the development process. The focus has been on evaluating the existing service and producing solutions for it. All aspects are explained to produce a complete understanding of the UCD process.

Understanding and specifying context of use includes defining who the users are and understanding who the stakeholders for the digital service are within the organisation. Users should be grouped according to their specific characteristics such as preferences, skill or experience level. The goal and tasks of each user group needs to be understood as well as the organisation goal for the digital service. There is also a need to understand the organisational affiliations that affect the development of the service. (ISO 9241-210.)

Specifying user requirements contains understanding what the users and what the organisation want to achieve with the digital service. This includes specifying user requirements for usability, understanding what the users want from the service and their needs for the user interface (ISO 9241-210). The information can be collected for example by using interviews or surveys. Organisational information can also be collected by interviewing stakeholders or by using other methodology to understand the goal for the service.

User Experience should be considered throughout the UCD process to ensure that the design meets user needs. When design solutions are produced, they should consider four aspects according to ISO 9241-210;

1. The user interface, tasks and interaction are designed so that they support User Experience.
2. Solutions are visualised to make them more tangible for the stakeholders.
3. The design should be further developed according to user feedback.
4. Communication of the solutions is discussed with all relevant stakeholders.

The evaluation of a digital service design should be done with users. User-based testing is recommended to gain direct user feedback on the design. Whenever users cannot be directly included in testing, user data or feedback can be collected to assess the design. Evaluation should be done through the lifecycle of the service and not only after new design implementation. Evaluation is based against set requirements. Iterative design rounds are completed, where necessary, based on the need that comes from the evaluation. (ISO 9241-210.)

2.3 Understanding and developing User Experience for a digital service

Companies have a vision in mind when they create digital services. They know what they want the service to be or what they want it to do. Creating digital services with only the end goal in mind can make it functional but might not be enough to make it successful. The defining factor between a successful digital service and a failed one can be the lack of attention to User Experience (UX). User Experience is the experience that the user has using a service, system or a product. User Experience is about emotion, usability and overall satisfaction. User Experience is gained before, during and after using a digital service. Good User Experience is more than just being satisfied with a well-functioning system. The aim is to have the quality of the overall service at a level which delivers positive experiences (Hassenzahl & Tractinsky 2006). (ISO 9241-210; Garrett 2010, 6-7; Kraft 2012, 1.)

The area of User Experience, and specifically the interaction between humans and digital services, has been one of the most discussed areas in the past couple of decades among service designers. User Experience has become even more talked about in the past decade as designing services has become more and more user-centred. User Experience is often talked about in connection with the virtual digital world such as with websites and mobile apps, but User Experience is relevant for any service or product that contains interaction with the user. (Roto et al. 2011; Chesnut & Nichols 2014, 8-9.)

It is important to make a difference between User Experience and consumer experience. Consumer experience includes a consumer's whole journey from marketing to purchasing through to after sales services. It encompasses the overall experience from all the touchpoints. User Experience on the other hand is focused on the usage of a specified product, system or service. UX, similarly than User-Centred Design, focuses on humans rather than only looking at a system's technological aspects. (ISO 9241-210; Roto et al. 2011; Kraft 2012, 4-5)

Hassenzahl & Tractinsky (2006) state that User Experience is a consequence of the user's internal state, the features of the service and the environment of the interaction. Roto et al. (2011) similarly conclude that an individual's UX is affected by the context of use, the individual user and the system itself. This means that User Experience is tied to the user's needs, drives, mood, expectations, the usability of the service, complexity of the use and voluntary status of the user, among many other aspects (ISO 9241-210). A common tool to understanding different user's User Experience is to create user personas, descriptions of different users. It should be recognized that even though the previously mentioned aspects can be used to create personas, every experience is still always individual (Swallow et al. 2005). User personas are valuable when assessing digital service User Experience and designing it to respond to user needs.

With a digital self-help portal, the context of use can be the different devices or physical environments that the user is using the service from. How the website responds to different browsers and devices should be decided by the organisation. Designing a website that is responsive for every possible scenario is in many cases not necessary. The environment of interaction in a website is affected by the content, functionality and ease-of-use among many other aspects (Roto et al. 2011). For users who come to a self-help portal to search and find help with their device issues, the ease of finding content can define whether they leave the service satisfied or feel the need to contact customer support in another way.

Understanding what User Experience consists of is the first step for any organisation, the second one is to understand when User Experience is accrued. Roto et al. (2011) propose different time spans when UX is accumulated. Anticipated User Experience happens prior to the actual usage whereas momentary User Experience is gained during the use. Episodic User Experience is gained after the usage and is based upon the individual's reflections of the usage. All of these three aspects create cumulative User Experience. Anticipated User Experience for company X's self-help portal can be affected by the company's brand, competitors similar services or other users' opinions of the website. Company X has a very strong brand image and it can be assumed that users of the self-help portal have in majority of cases already anticipations of the portal's UX before using it.

When the content and timespan of UX is understood, developing it becomes possible. Developing User Experience for digital services requires understanding different aspects; visual, emotional and technical. The more important part still is to understand how all these aspects affect each other. Studying all the aspects in-depth at once requires a lot of resources and can even cause more confusion than create insight. Studying and testing the overall User Experience in smaller pieces at a time is recommended. Roto et al. (2011) propose that also the time span should be clarified in order to better understand if negative or positive User Experience is affected by it. (Kuniavsky 2003, 43-44; Chesnut & Nichols 2014, 7.)

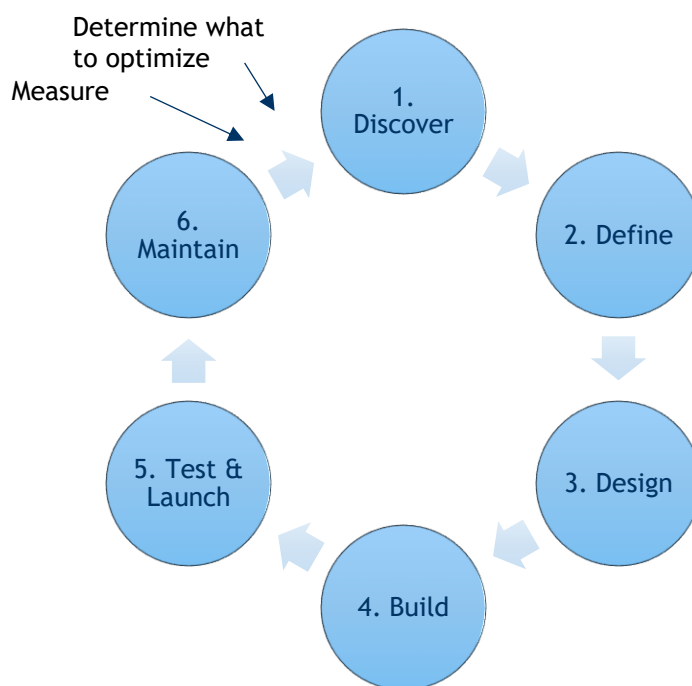


Figure 2 Iterative UX process (Chesnut & Nichols 2014, 237)

Chesnut & Nichols (2014, 237) describe the high-level process of developing User Experience as a closed iterative development loop (Figure 2). Goodman et al. (2012, 32) similarly define the development as a spiral that includes examination, defining and creation. The development happens iteratively, and development loops circle the final product constantly (Goodman et al. 2012, 32.). The proposed development loops incorporate the three aspects that Roto et al. (2011) and Hassenzahl & Tractinsky (2006) state as the cornerstones of understanding User Experience; users, environment and context. Chesnut & Nichols (2014) suggest in their model that User Experience metrics should be set to enable organisations to follow up on UX development needs.

The first step of User Experience development as presented in Figure 2 is “Discover”. Discovery means setting business goals, understanding who the users are, the status of the digital

service and the competition landscape. The second step “Define” is done together with the discover step. Defining is creating user journeys and information architecture and assessing the technological side of the website. (Goodman et al. 2012. 32.; Chesnut & Nichols 2014, 22-23.)

In step three, the design phase, the higher-level visual design aspects are planned to give an idea of the layout. Decisions about the website feature design need to be made at this step. The build phase includes building the design. This includes the contents and imagery as well as technical solutions for the website. The build phase has a strong connection to brand image and incorporates identity design, which will be discussed in the next chapter. This is an important and time-consuming part in which the design step is implemented, often by a dedicated development team. (Goodman et al. 2012. 32.; Chesnut & Nichols 2014, 23-24.)

Step five “Test & Launch” is a crucial part which ensures that the whole design is working as planned. Technical and usability related issues are tested and fixed before launching. This is often done by using usability tests or user acceptance testing. The last step “Maintain” includes keeping the digital service up to date, working and relevant. Further development decisions should be done according to relevant User Experience metrics. Measurement should be done after each new launch. Decisions on what will be fixed and optimized need to be done before starting again in the discovery phase. (Goodman et al. 2012. 32; Chesnut & Nichols 2014, 23-24.)

User Experience is strongly connected to the topics of Human-Computer Interaction and User-Centred Design. They all touch the areas of interaction and understanding human needs. Understanding, analysing and developing UX requires commitment from the responsible stakeholders within the organisation for implementation to happen. This chapter has described what User Experience contains and how it can be developed utilizing an iterative process. To go deeper into understanding the specifics of User Experience in the context of a self-help portal the topics of identity design, information architecture and interaction design will be explained in the next chapters.

2.3.1 Brand as an influencer to user expectations and service identity

Users have expectations when it comes to products and services. Expectations are influenced mostly by brand image but also by previous experience. Customers often have initial expectations even before they have bought a product or used a service. Reaching and fulfilling these expectations should be of interest to any company as it equals satisfied customers. Part of understanding user expectations is to look at the value users are getting. (Newbery & Farnham 2013, 122.)

Companies with a strong brand image normally have users with a high expectation of their services. These users are easily disappointed if their expectations are not met, they also expect positive experiences to last, if not even increase. Lower expectations are related to products with a weaker brand image. When a user has low expectations already about the product, they can more easily be surprised by smaller positive factors in the User Experience. (Kraft 2012, 3-4.)

Company X has a strong brand image. The brand represents an active lifestyle with trustworthy, quality products with an attractive design. A strong brand image leads to high user expectations on all the company's products and services. Surprising or exceeding these expectations can be challenging, so it is important to reach the initial user expectations. Gaps in user expectations versus what the users feel that they get need to be recognized (Newbery & Farnham 2013, 65).

In addition to user expectations, brand influences the character or the identity of a service. Hassenzahl (2003) states that a service, such as a self-help portal, is characterized by its features including content, presentation, functionality and interaction. These features form the identity of the service. The identity is connected to and reflects the company's brand image (Kuniavsky 2003, 50-51). Although the brand has an impact to the identity of the service, even a strong brand cannot save a bad UX and or stop the negative reviews that come with it (Levy 2015).

Presentation as well as content, functionality and interaction are a crucial part of a self-help portals User Experience. Presentation includes the visual elements of a website and the feelings it visually evokes. It is what makes it stand apart from the competition (Kuniavsky 2003, 50-51). Presentation is often the responsibility area of an organisation's marketing department. They make sure that every service and product reflects the corporate brand identity (Kraft 2012, 48). Especially in the case of a company website, the whole website should be consistent with its brand imagery and feel. The features of a website are always selected to reflect a certain identity of the service such as highly technical or easy-to-use. This is called by Hassenzahl (2003) the intended product character, the personality of the service.

The selected features or identity lead to consequences or the result. The aim is to affect the products appeal, pleasure and satisfaction (Hassenzahl 2003). In order to do this the identity designers, need to understand who the current users of the product are, what kind of needs they have, how are they using the product and what are they influenced by (Kuniavsky 2003, 51-52). User perspective to identity starts from the users first contact with the features, when they open the website. Based on the features the user creates his own opinion of the product character. The product character consists of pragmatic and hedonic attributes, the

user's feelings and opinions. By unconsciously assessing the attributes, a user ends up with opinions about the products appeal, pleasure and overall satisfaction. (Hassenzahl 2003.)

The intended product character is always the designers end goal and idea about the product. It is always intended and may not represent what the actual apparent product character is for the user. How the product is characterized by the user is affected by the user's own expectations and standards as well as the actual features. This means that the characterization is different to different individuals. To understand how the identity should be reflected on a self-help portal the key is to understand user needs. Data can be collected by interviewing users or key stakeholders, using surveys or doing competitor analysis (Kuniavsky 2003, 52.). This data will give insight into the users' design preferences and needs. (Hassenzahl 2003.)

Newbery & Farnham (2013, 69-71) state that the User Experience is these days more and more reflected by the value that users get. Even though a company owns and creates its brand, users are now more and more the ones who can influence on what the brand image is like. In the digital world sharing experiences is rapid and bad experiences spread fast. (Newbery & Farnham 2013, 71.)

$$\text{Perceived Value} = \frac{(\text{What has been done or provided by a business}) - \left[(\text{Customer needs}) \times (\text{Customer expectations}) \right]}{\text{Customer context}}$$

Figure 3 Perceived value (Newbery & Farnham 2013, 75)

Perceived value as described by Newbery & Farnham (2013, 75) in Figure 3 equals to what the company has provided minus customer needs times customer expectations divided by customers context. Perceived value is the user's perception on whether the effort they are putting into the product or service is in balance with what they got from the company. Newbery & Farnham (2013, 46) also note that there is a difference in the perceived value depending on the user. For a new user it can be different than for a more experienced user who has used the service several times.

It is important to note that Newbery & Farnham's equation (Figure 3) is not meant to be a mathematical one or to provide metrics. The intention is to use it as a tool when developing and looking at aspects of User Experience and especially when looking closer at user value

and user expectations. Especially when looking at if the user is getting any value from the service.

2.3.2 Creating information architecture for a website

Information architecture is the structure and hierarchy in which information or content is presented in product or a service (Chesnut & Nichols 2014, 155). Information is created by people based on data (Rosenfeld et al. 2015, 24). Information creates knowledge when it is processed by the reader. In the case of a self-help portal, information is the content and features that are represented on the website. The way information architecture is presented or implemented on a website is not something that a user necessarily contentiously looks at. Even the designers of the architecture might not be aware that creating and presenting content at the same time creates information architecture. The user perspective and the company's perspective on how the information should be arranged often differ by need. (Kuniavsky 2003, 44-45; Rosenfeld et al. 2015, 26.)

Rosenfeld et al. (2015, 31-32) state that users, content and context are the basis of successful information architecture. Context in this case includes the business side including enough resources, possible limitations, available technology and budget for the upkeep and development of the service. Content includes understanding the volume of content, document types and the existing structure. Understanding the users, their behaviour and goals is the third aspect.

How information architecture is formed can be influenced by needs coming from organizing information according to the organisation's internal categorization. Often in customer support, this kind of categorization comes from customer relationship management (CRM) tools where the customer service content is managed. The tool itself includes pre-set categories that need to be used for the customer service personnel to find the information. Categorizing information according to internal needs can be adequate, if it doesn't affect the user side. For users the most important factor is to find the information that they are looking for, without getting lost. (Kuniavsky 2003, 45.; Rosenfeld et al. 2015, 25.)

In company X's case, information architects for the self-help portal are the customer support team and the marketing team who create the content to the website. It is these teams that are responsible for the information architecture of the portal and making sure that it reflects users' expectations and needs, and it is easy for them to comprehend (Kuniavsky 2003, 46-47). Kuniavsky (2003, 46) states that the end goal should be that the users never get lost and are able to predict what happens when they do something. The information architecture affects the overall usability of the whole portal (Chesnut & Nichols 2014, 156). Using consistent

terminology throughout company X's content is important, as it lessens the amount of confusion in the user's side. The terminology should reflect the user's perspective and not only the company's own terminology. (Kuniavsky 2003, 46.)

Information architecture should always be included already at the start of development of a website, as especially large amounts of content are hard to reorganize when the service is already up and running. Understanding who the users are is a crucial part of information architecture planning, as different user types have different needs, preferences and expectations. User personas are a good tool for describing users and sharing the understanding of users when several teams are working with the same service. (Kuniavsky 2003, 46-47.)



Figure 4 Search User Experience (Russell-Rose & Tate 2012, 1-2)

In a self-help portal it is central that users find the information they are looking for. Search is therefore a key element for its information architecture. Russell-Rose & Tate (2012, 1-4) describe users' search experience in four dimensions (Figure 4). Understanding user personas or types of users is the first dimension. It can also be called the users level of knowledge and expertise. This dimension requires understanding who the users are and what is their expertise level for using the service. Are they new customers with little technical knowledge or are they very technically oriented persons with experience in searching for information?

When there is enough knowledge about the user types, the second dimension is to understand their goals. What are they searching for and how are they using the search? What kind of key words are they using? The second dimension is important in developing the sites information architecture, as the results help in improving the terminology and content tagging. The third

dimension is context. What influences the users in social and physical context? When and how are they using the service. Are they searching for information via a mobile while travelling when they are most likely busy or are, they searching for it at home in a less stressed environment? The fourth dimension is search mode. As the search is a crucial part of the overall information architecture working. How do we make sure that the user can complete all their user journey, whether it is finding a specific solution, comparing products or just browsing for new content? Understanding the four dimensions creates understanding of the overall search experience. These elements can also be used to look at the information architecture. (Russell-Rose & Tate 2012, 1-2.)

Leung (2008, 15.) states that any digital service requires the user to learn how to use it, learning should always be taken into consideration as part of designing the service. Often the learning is small things like learning where to find information on the website or how to use the search on the website. Even though the learning often happens unconsciously, if the user is not able to learn to achieve their end goal it can influence the overall User Experience. Positive learning experiences create an upward learning curve and negative experiences a downward curve (Kraft 2012, 1-2). When the curve goes down enough it is likely that the user will leave the service before reaching their end goal. Therefore, it is essential to take the users learning into account in the design and development of information architecture. The design should enable the user to understand their mistakes and learn from them. (Leung 2008, 15-17.)

Learning is a very personal matter and each of us learn things in a different way and in a different time frame. We also react as users to learning and especially not learning in various ways. Taking users emotions into consideration is an integral part of designing User Experience. Positive emotions should be emphasized to overcome possible negative aspects. (Kraft 2012, 2-3.)

Some learners are more visual whereas others are more verbal. Verbal learners prefer reading and listening. Visual learners prefer images, videos and different kind of visual material. (Russell-Rose & Tate 2013, 14-15). In a self-help portal these two learner types should be considered when designing and developing the information architecture. Company X sells electronic devices which can be complex to use to some users and require support from the company. Providing both visual and text-based content can answer to the need. To understand the preferences in content, analytics can be used to get insight into what kind of content users are using.

2.3.3 Designing interaction for a website

Interaction design means designing the interaction between services, products or systems and their users (Kuniavsky 2003, 48; Norman 2013, 5). Interaction design focuses strongly on designing the interaction elements, and therefore is different than the science of Human-Computer Interaction (Silver 2007). Saffer (2010, 4) states that interaction design is seen as an applied art instead of a science, as it is always tied to a context and aims at solving a specific problem. It should be noted that the quality of interaction design always affects the overall User Experience (Silver 2007).

As digitalization has come to touch many products and services, so has the amount of interaction required by the user increased (Moggridge 2007, xxii; Cooper et al 2014, xix). Phones are a good example of this. The interaction between a landline phone and its user was limited to dialling the wanted number and picking up the phone. These days a mobile phone enables us to interact with limitless amount of services via mobile applications. Applications that require users to understand and use different kind of interaction designs. Interaction design is a response for managing the complexity of today's products and services, enabling the users to reach their objectives (Siang 2019).

According to Crampton Smith (2007) interaction design includes considering words, visual presentation, space and time. Crampton Smith (2007) describes these as the dimensions of interaction design language. Silver (2007) has later proposed a fifth element, users' behaviour. Saffer (2010, 3-4) and Cooper et al. (2014, xix) emphasize that interaction design is about the design of behaviour, what happens during the interaction. Norman (2013, 5) proposes that the most important goals of interaction design are ensuring understandability and improving usability. Interaction design should focus on helping the users understand how to use the service works, and why and what happened when using it. Even though it might seem obvious in today's user-centred world that users should be involved in interaction design, Saffer (2010, 4) notes that interaction design has concentrated in applying user-centred methodology only during the past ten years.

When regarding interaction design in a website context Crampton Smith (2007) states that words need to be consistent and easily understood by the user. Words on visual elements, such as buttons and navigational objects should represent clearly what will happen when clicking on it. Balancing the amount of words or text on a website can be challenging. Visual elements such as images and icons need to support the text elements. Graphical elements are in many cases dictated by brand and adjusting them, in most cases, will require the interaction designer to work closely with the brand responsible team. The visual elements such as typography and images can be used to structure the website. To gain users attention im-

portant topics can be made more apparent by using visual elements. Information about products can often be presented with diagrams or graphics instead of plain text. (Crampton Smith 2007)

The space or the physical environments affect the interaction elements, as there can be different needs for a user using the website via a mobile phone or via a desktop computer. It is important to understand the influence of different physical environments, if the user is using his or her finger to navigate on a mobile screen or a mouse on a computer. Crampton Smith's time element encompasses the time spent interacting with the first three elements. The time that a user interacts with a website can be cut short if they cannot quickly find what they are looking for. Looking at the time aspect, how long the interaction takes, can tell about issues in the interaction design. The fifth element, users' behaviour should be an interest for any organisation running a website. Tracking and understanding what users are doing on the website and what they are feeling is a road to good User Experience. (Crampton Smith 2007; Siang 2019.)

Interaction design on a website can be evaluated by using task flows or user journeys to understand what kind of guidance the user needs and where are they getting lost. New designs can be tested with wireframes and prototypes. Users personas come into play also in interaction design, different users have different needs. More technical users might find it easier to find information with less guidance than first time users. Different analytics also give insight into how users are interacting with the service. The most common study method is usability testing, which can be used in different point of development and which gives insight into the user's ability to use the service. Information architecture and interaction design should be developed hand in hand. As Kuniavsky (2003, 49) states, information architecture lays the way for navigation and interaction design shows the users where to go and how to get there. Interaction design is therefore always done after the foundation is clear. (Kuniavsky 2003, 49- 50.)

2.3.4 Usability in website development

Usability is defined by ISO standard (9241-11) as the degree to which a user can use a product or service effectively, efficiently and be satisfied with it. Usability is always tied to a specified context and users' tasks (ISO 9241-11; Spiliotopoulous et al. 2010, xvii). According to Spiliotopoulous et al. (2010, xvii) usability is never a characteristic of a product, as it is tied to a specified context of use, it is always studied through its users. Nielsen (1993, 26) has defined usability to include the following elements; learnability, efficiency, memorability, errors and satisfaction. According to Nielsen (1993, 26) a user should be able to easily learn the use of the system. The system should enable the user to complete their tasks efficiently. The user should be able to pick up from where they last left, to easily remember how the system worked. The system should ensure that users do a minimal amount of errors and support in recovering from them. Fulfilling all of the usability needs is no easy task for any organisation.

Technology changes rapidly and constantly modifies the user's context of use. Time used for development is more and more agile and rapid, there is less time for the designers to use. The user types are diversified due to digitalization and require understanding a variety of user needs. User-centred approach is therefore clearly needed when discussing and developing usability. (Nielsen 1993, 26; Shneiderman & Plaisant 2005, 16-17; Spiliotopoulous et al. 2010, xvii-xviii.)

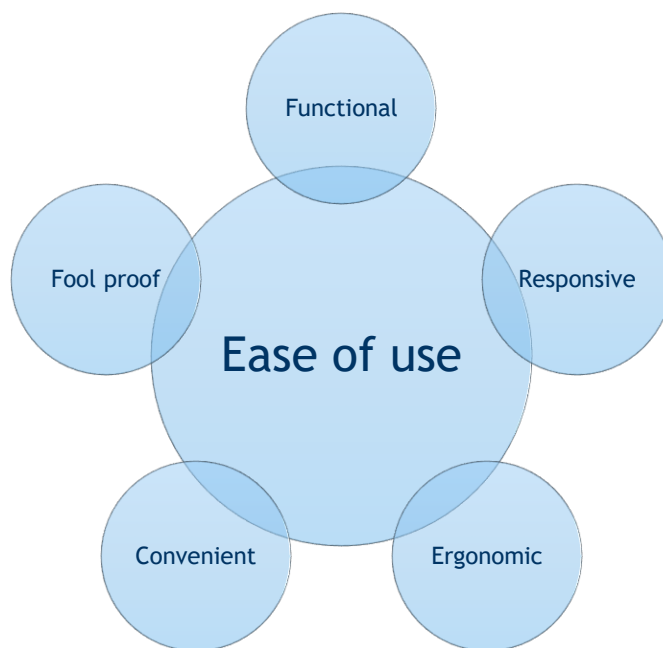


Figure 5 Ease of use (Reiss 2012, 29)

Reiss (2012) divides usability into two aspects that can be applied when looking at website usability; ease of use (Figure 5) and elegance and clarity (Figure 6). The first looks at the aspect of whether the website does what the user wants it to do. The second one looks at whether it does what the user expects it to do. The question could also be that is the information architecture on a website such that it is easy for the user to use and is the interaction design planned so, that everything that happens is logical for the user? The interdependence between usability, interaction design and information architecture are apparent and should be regarded when developing the overall User Experience of a website. (Kuniavsky 2003, 50.; Kraft 2012, 62.)

In Reiss's model ease of use consist of elements that are related to physical aspects that are part of interaction design. This means that for example navigating on a website is easy for the user as the navigation buttons and other design factors make the site understandable and user-friendly. They enable the user to complete their tasks. Ease of use is split by Reiss (2012) to five different elements; functional, responsive, ergonomic, convenient and fool

proof (Figure 5). Functional means that when a user uses a search function on a website and press enter, they will get search results. Or when a user starts a how-to video in a self-help portal the video will start playing. Functional is all about the elementary usability, that everything works without errors. It means that the icons and links work respond to the user and in an acceptable timeframe. (Reiss 2012, 29-35.)

Responsiveness means communication with the user. It can include users' attention seeking aspects such as ads and actions that show that something is happening due to the users' action such as a download screen. Responsiveness in websites is also about the ability to use the service with mobile and desktop interfaces and different browser types. Creating a website that is responsive to the increasing number of different devices can be challenging. In many cases companies implement responsiveness by adjusting the content to reflect different needs for desktop and mobile users. Yet many companies forget to consistently test the usability of both. (Reiss 2012, 55-58.)

Ergonomics is the design of a device to fit human physical and psychological needs (Reiss 2012, 71). It can be difficult to see what ergonomics has to do with using digital services, but especially for mobile phone users' ergonomics is important. Using just your fingers for browsing through a website is tiring to your hands and cause ergonomic issues. Trying to see small text can tire your eyes. Ergonomics is therefore an important factor also in digital services. Reiss (2012, 75) states that ergonomics should be considered in aspects such as text and button size and overall the layout to avoid unnecessary movement, zooming and clicking by the user. Planning responsive content should therefore always look at the ergonomic side.

Convenience means that a product or a service is easy to use for its user. This is also referred to by Nielsen as learnability (Nielsen 2010, 26). Understanding what this means to different user types can be challenging, as we are all individuals with different sense of what is easy. These differences are often also true between teams within the company who is providing the service. The developers might see more technical solutions easy to use whereas marketing might see it differently. To understand what is convenient for the user you need to understand who the users are and whose needs are you trying to fulfil. In terms of usability testing it means doing usability testing with targeted user personas. (Rubin & Chisnell 2008, 8; Reiss 2012, 91-101.)

Foolproof means that anyone can use your website without making mistakes. As Nielsen states, the amount of errors should be minimized (Nielsen 2010, 26). This means adding guidance and notifications to ensure that the user is not doing something he or she didn't intend to do. Foolproofing can be a delicate issue, as too many warning signals and ok approvals might make the user irritated. Users do not want to be constantly told what to do. Foolproofing should therefore be planned so that it only covers the necessary aspects that stop the user

doing from doing something irreversible without affecting the overall usability. (Reiss 2012, 113-114.)

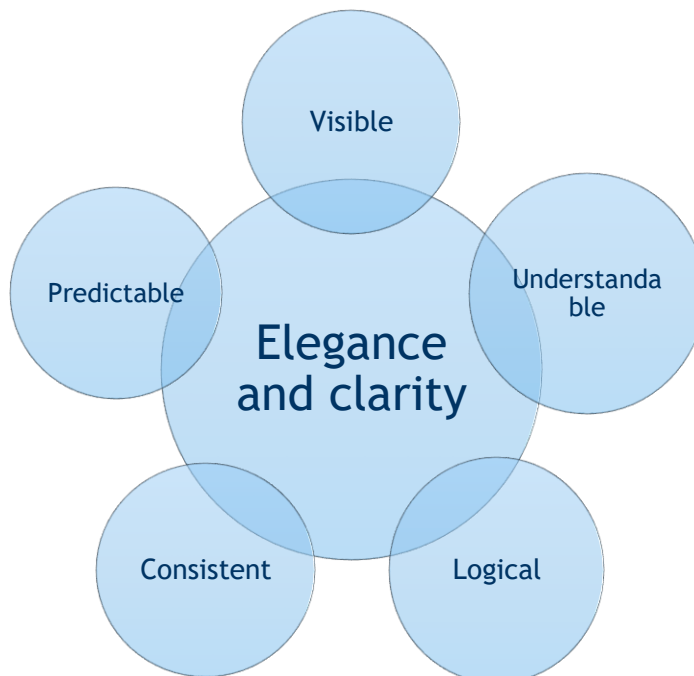


Figure 6 Elegance and clarity (Reiss 2012, 137)

Reiss's model of elegance and clarity (Figure 6) is split into five elements, similarly than the ease of use. The elements are visible, understandable, logical, consistent and predictable. This model gives insight into if the design of the website does what the user is expecting it to do. Is the information architecture logical and functionalities understandable?

Visibility for a self-help portal means that it is easily found by the users in the company's website. The information that users are looking for is visible on the portal and is not hidden, even when the website is responsive. The most important topics and functions need to be represented at the top of the page. This can include search functions or direct links to popular solution topics. Less important aspects can be placed at the bottom of the page, this can be for example legal notices. Simplicity throughout the website increases visibility of important topics and functions. (Reiss 2012, 142-148.)

A service or product that is understandable often also has good information architecture. Understandable means that any images or terms that are used can be understood by both the users and the people developing the product or service. There are a lot of cultural factors that can affect especially the fact how we perceive images. In order for a self-help portal to

be understandable it needs to use clear images and terms and take into consideration the terminology that the users understand. (Reiss 2012, 166-167.)

Ease of use and information architecture relate to the logic of the website (Reiss 2012, 185-189). When a user uses a website, the flow or the order in which the user reaches the result needs to be logical. This means that anything that a user does makes sense to him or her. The logic can be investigated further by using usability testing to draw user journey maps. User journey maps paint a picture of how the user is completing a specified task. They show each interaction with positive and negative reactions to it.

Consistency means using the same imagery and terms throughout the website. Consistency need to be present in interaction design as well as information architecture. On a website the basic factor of consistency is that the website frames look similar on each page. This means the footer and header bars as well as navigational buttons. The user will always know where to get back and how to find basic functions such as contact information. Consistency is relevant for the search experience as search results are tied to the content being consistent with terminology. Consistency in search also means that a user will be led to a search results page every time that they press enter. Predictability means that the website will not surprise the user, instead it does what the user is expecting it to do (Reiss 2012, 217). In terms of usability, predictability can be as simple as adding a process bar into a website to show the different steps that a user must go through. Predictability can also be about placing functions such as the search function to where the users will expect it to be. (Reiss 2012, 199-201.)

Usability has a significant part in creating overall User Experience, but the relationship also works the other way. Reiss (2012, 20) states that a positive User Experience influences the quality of usability. Usability is also said to represent the quality of a product or a service (Rubin & Chisnell 2008, 3; Spiliotopoulous et al. 2010, xvii). A website user might have a positive experience when searching for solutions, this experience can overrule minor technical usability issues with the actual product and leave the user feeling satisfied. If a website user is unable to understand how to use the site, or it just simply doesn't function as it should, the user will not continue with the use (Reiss 2012, 21). Usability of a website can be improved by including features and elements on the site that are known to help a specified user type reach their goals (ISO 9241-11). This requires knowing the users and understanding the context of use.

According to the ISO standard on usability (ISO 9241-11), to measure usability on a website we need to understand the goals that have been set for it. A goal for a self-help portal could be to "easily provide support material for customers". These goals should be understood and listed. Understanding the possible issues with usability requires measuring users' performance and satisfaction when using the website (ISO 9241-11). Kraft (2012, 27) states that user needs

need to be understood when developing and testing usability, to ensure that the right aspects are tested and that the improvements reflect a real need from the user's side.

Usability is most commonly measured by usability tests that are used to investigate whether a product or a service enables the user to complete a specified task (ISO 9241-11; Nielsen 1993, 27). They are used to look at if something is working as it should be and to find possible short-falls in the functionality. Reiss (2012, 25) states that understanding usability and usability testing has come a long way in the past decades. In many companies the issue with usability testing still is that once a service is up and running, the responsibility and willingness to do further usability testing is very limited. There can be issues with budgeting resources or just with wanting to make major changes after the launch. Therefore, it should be emphasized that usability testing does not need to be a heavy and resource-tying project, it can and should be done with simple quick tests. (Kuniavsky 2003, 50; Kraft 2012, 62.)

Usability has many aspects that need to be considered, but the most important for companies is to take usability into account consistently when creating and developing products and services. Usability is rarely, if ever, perfect for any product or service and improving it will always affect the overall User Experience.

2.3.5 Measuring website User Experience

As stated in chapter 2.2 User Experience is about emotion, usability and overall satisfaction. Chesnut & Nichols (2014, 237) suggest that User Experience metrics should be set to enable organisations to follow up on UX development needs. Metrics are a way of measuring a specific area or subject of User Experience (Tullis & Albert 2013, 25). Sauro & Lewis (2012, 9) use the term user research to emphasize that the measurement always happens between a user and an interactive system. The goal of measuring User Experience is to quantify the user's behaviour (Sauro & Lewis 2012, 9). User Experience metrics can tell about how effectively users are able to complete tasks, how much effort they needed to put into it and how satisfied they were with the experience (ISO 9241-11; Tullis & Albert 2013, 7). User Experience measurement can include technical as well as emotional factors of the user.

According to Tullis & Albert (2013, 26) the key for User Experience metrics is the consistency in measuring them. The measurement results should be comparable for conclusions to be possible. User Experience should be measured as a continuing process as part of the strategy and not only as separate projects (Chesnut & Nichols 2014, 236). The metrics need to be observable and quantifiable. Observation can be for example seeing if a user is able to reach a set end goal. Quantified results give us information in numbers or by counting. (Tullis & Albert 2013, 26.)

Setting a User Experience goal for the website should be the first step when creating measurement. The goal or opportunity can be measured in itself, but the goal also helps in setting objectives. Objectives divide the goal into more concrete aspects that want to be achieved. User Experience goal and objectives should always include the user's perspective as well as the company's perspective. Metrics can be chosen when the goal and objectives are clear. (ISO 9241-11; Chesnut & Nichols 2014, 238.)

Organisations often rely on measuring the User Experience of a website only by simple customer surveys (Tullis & Albert 2013, 4). Surveys are a good tool, but User Experience measurement can and should be more than that. Tullis & Albert (2013, 8) state that User Experience measurement can give details on the website's effectiveness, efficiency and satisfaction. The three aspects that are also mentioned as the basic elements of usability measurement (ISO 9241-11). All of these three aspects can be measured using different tools and methods. Common UX study methods are usability tests, observation, interviews, surveys, A/B tests, Net Promoter Score (NPS) and collecting analytics (Sauro & Lewis 2012, 9-10). The study methods typically contain the measurement of completion rate, errors, task times, satisfaction, retention time, time to learn, usability issues and access to help (Shneiderman & Plaisant 2005, 16; Sauro & Lewis 2012, 9-10). (Nielsen 1993, 207-223; Tullis & Albert 2013, 7-8.)

Website User Experience metrics can include web analytics, key performance indicators (KPIs) and conversion metrics. Analytics means the collection and processing of data; the result is an analysis of the collected data. Tools such as Google Analytics is commonly used by companies to collect website analytics. Metrics are the factors that are measured to create analytics. KPIs are in most cases connected to business goals, they give an overall picture of the performance. Conversion metrics tell if a user has completed a set User Experience objective. Often conversion is used in e-commerce to look at how many website users turned into paying customers. (Beasley 2013, 3-4; Chesnut & Nichols 2014, 240-241.)

Setting and observing User Experience metrics is important for improving and designing the overall User Experience of a website. They give hands-on comparable data that can be followed and compared before and after making changes to different User Experience elements. The information can be shared between teams to show possible savings or reached goals. They can also show how minor issues might cause larger problems when accumulated and help in getting approval to fix these issues. Which metrics are chosen should be determined by understanding goals and objectives of the product or service, but also by looking at the aspects of effectiveness, efficiency and satisfaction (Tullis & Albert 2013, 9)

2.4 Developing self-help portal user experience

The theoretical part of this thesis has touched the topics of Human-Computer Interaction, User-Centred Design and User Experience with its different elements. The science of Human-Computer Interaction is the umbrella that holds under it the philosophy of User-Centred Design and development of User Experience (Lowdermilk 2013, 5-6). Human-Computer Interaction has been discussed in the theoretical part as it is the foundation for User Experience. HCI is a vast design science and as such will not be discussed further in the methodological part, as the purpose of this thesis is to concretely understand the current User Experience within company X's digital self-help portal.

User-Centred Design is the philosophy that is required to successfully develop User Experience. Users are the centre of attention in both UCD and UX. As described in chapter 2.2, to implement UCD into an organisation it requires a clear process to be followed (ISO 9241-210). Due to the scope of this thesis, implementing and following up on potential design improvement suggestions is not possible. The methodological part of this thesis will therefore focus on the first three steps of the UCD process. These steps are understanding and specifying the context of use, specifying user requirements and producing design solutions. The last step of evaluating the design and measuring the changes has been left out.

To reach the objectives of producing suggestions on User Experience improvement and UX measurement, the theoretical part has answered to the supportive development questions of "What does User Experience contain?" and "What kind of metrics can be used to measure User Experience?". To further gain answers to the two supporting development questions "What are the issues with the self-help portal User experience currently?" and "Who are the users of the self-help portal?" the first three steps of the iterative UX process (Chesnut & Nichols 2014, 237) described in chapter 2.3 are used in the methodological part. As mentioned previously in this chapter, building and measuring suggested design solutions is not possible due to the scope of this thesis. Therefore, the steps of building, testing & launching and maintaining as well as measuring are not incorporated in the methodological part. The first implemented process step is discovery; understanding business goals, users and status of the self-help portal. The second one is defining with user journeys and usability tests. The third one is producing design solutions.

3 Methodology

This part of the thesis will describe the development strategy chosen for this thesis, the methods that were used and the theory behind the methods and justification for selecting this methodology.

The development strategy used for this thesis is case study. The methods used for data collection in this thesis were workshopping, interviews, user journey mapping and usability testing. Company X's already existing customer feedback and data were used and analysed as background information.

3.1 Case study research

Case study research is a popular research strategy often used in social sciences. The core for case study research is the study of a case or of multiple cases (Laine et al. 2007, 9). The case is defined by research questions, research composition and the analysis of the gathered data or material (Eriksson & Koistinen 2014, 1). A case study often answers to the questions Why or How (Laine et al. 2007, 10; Yin 2009, 10). Laine et al. (2007, 9) and Eriksson & Koistinen (2014, 22) state that case study research is not in itself a method but rather a strategy or a way of doing research. A case study normally looks at a phenomenon such as User Experience in this thesis. As Laine et al. (2007, 11) state, a case study can start from two perspectives; starting with the actual case and defining the research topic or from the research topic and finding a case for it.

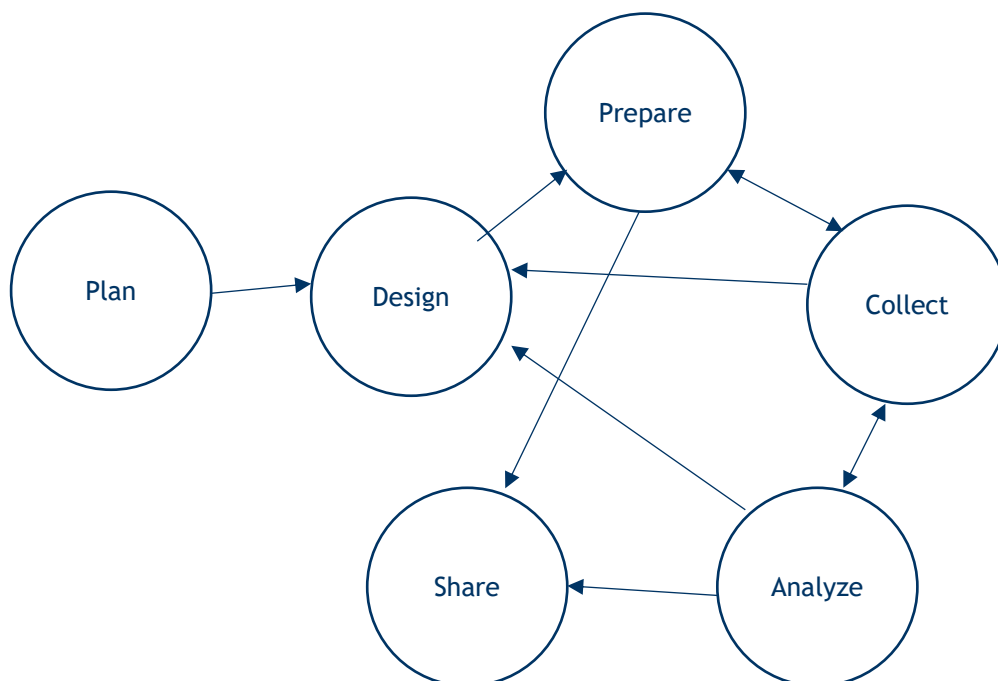


Figure 7 Doing case study research: a linear but iterative process (Yin 2009, 2)

Yin (2009, 2) describes the process of doing case study research with six different steps (Figure 7); plan, design, prepare, collect, analyse and share. These steps were used in this thesis to conduct the case study.

3.2 Plan

The planning phase consists of defining development questions and choosing the development strategy based on them and choosing case study as the development strategy (Yin 2009, 2). Comparison between development strategies should be done in in the planning phase. Eriksson & Koistinen (2014, 23) state that the development questions can still be modified as the research goes forward.

Case study was chosen as the development strategy for this thesis because the case, self-help portal User Experience was already set by the commissioning company as the topic. The case study therefore started from the self-help portal and went forward to defining the development questions in more detail. Case study was also chosen because only one case was set to be developed, rather than having multiple units to develop that is typical for quantitative research (Laine et al. 2007, 11; Swanborn 2010, 5). The information that was aimed to be gathered was mainly qualitative such as interviews and workshop outcomes. Quantitative data was included in the form of company x's existing customer feedback data and numeric usability testing data. Large surveys, which are a common character of extensive quantitative research and not for a case study, were not relevant for this thesis (Swanborn 2010, 14).

The first versions of the development questions were defined together with company X representatives in 2017. The questions were developed further and supporting questions were set to further defined, as described in chapter 1.1.

3.3 Design

The design phase includes further specifying the case that will be studied, looking into the possible issues for the study and creating the theoretical part of the study (Yin 2009, 24). Design means creating the framework and plan for the study. The framework includes understanding what kind of data needs to be collected and analysed to conduct the study.

The first method used in this thesis to follow the iterative UX process (Chesnut & Nichols 2014, 237) was to define the opportunity. The opportunity is the goal which company X is trying to achieve with the self-help portal. Setting the goal was the first step as it was needed to derive objectives that are used to test usability (ISO 9241-11). To understand the user's needs they need to be defined at the same time as the company's own goals (ISO 9241-11). The aim is to visualize the aspects that the user needs to have for the opportunity to be fulfilled (Szabo 2017, 7-10). Defining the opportunity was done in the design and not in the collect phase to clarify what kind of data would be needed.

To define the opportunity a workshop was held on in 2018 with two company X representatives. The participants were selected to the workshop by their position in the company. These two persons are responsible for the self-help portal and its development. The opportunity

needed to be defined with participants who have knowledge of the goals for the website and of the actual users. The workshop gave an opportunity for the participants to think about the user perspective to achieve what they want for the website. The workshop helped further specify the case that is studied.

User Experience mapping was used as a tool in the workshop to produce the goals and understand users' needs. The writer of this thesis worked as the facilitator for the mapping. Three aspects were mapped; the outputs, the outcomes and the opportunity of the self-help portal. The opportunity is the final goal from the company's perspective for the whole self-help portal. Outputs are what the users are doing, and outcomes are the result of what they did. As an example, a user might search for information on the website as an output be satisfied with the information that they found. Company X representatives were put in the users' shoes to think about the outputs and outcomes from the users' perspective. Results were documented by the thesis writer on sticky notes and after the workshop visualized into digital format. (Szabo 2017, 6-34)

3.4 Prepare & Collect

Prepare is the third phase in Yin's (2009, 2) model. Preparation for the data collection was done in co-operation with the commissioning company. The reasoning for the selection of data collection methods is described in the following chapters. Interviews were chosen as the method for user persona creation and the interviewees were selected by company X. Usability tests were chosen as the method for technically testing the self-help portal and for creating a user journey map. The interviews and usability testing were done during 2018. Company X also provided prior customer feedback and data as background information to understanding the current User Experience of the self-help portal.

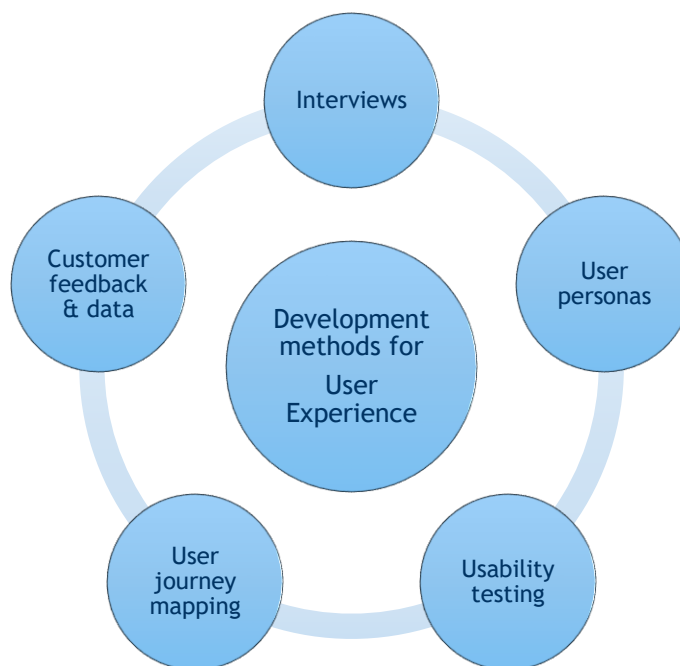


Figure 8 Development methods for User Experience (Tiira 2018)

The collect phase includes the collection of data. The development methods used to develop the self-help portals UX are described in Figure 8. In this thesis data was collected via interviews, usability testing and user journey mapping. Documentation, company X's customer feedback and data was also used. Using multiple methods for data collection was chosen to ensure that the data would be rich, and technical as well as emotional aspects would be covered, as these are essential in User Experience.

The interviews were conducted first to create user personas. User personas were then utilized by choosing the most prominent persona to be used in usability testing and in user journey mapping. Information was combined from interviews, user personas, usability tests, user journey map and company X's customer feedback and data to create understanding of overall User Experience.

3.4.1 Creating user personas with interviews

Personas are descriptions of a specific group such as users or customers (Leung 2008, 26). Effective personas are a result of a study. Personas make user needs more visible and tangible. Creating visual representation of users makes them easier to share between teams and departments. Personas make the users more real and help different teams working with planning services and products for them to have a united understanding of users' needs (Goodwin 2009, 601-608; Stickdorn et al. 2018, 40). Personas can be utilized in all aspects of website User Experience development in identity design, information architecture, interaction design

and usability (Goodwin 2009, 608). Usability testing even requires specifying the users, creating personas, to understand their goals (Swallow et al. 2005). Personas, even though based on a study, are fictional, yet they bring out the motivations and behaviours of real-life customers (Schneider & Stickdorn 2010, 173). Personas should be used in all stages of design and development (Griffin et al. 2015, 1k).

Understanding and specifying the self-help portals context of use is the first aspect of UCD implementation presented in the theoretical part (ISO 9241-210). As described in chapter 2.2 the context of use includes defining who the users of the service are and grouping them according to specific characteristics. Discovering the users' needs as well as understanding business goals is also the first steps in iterative UX development process (Chesnut & Nichols 2014, 237). This user discovery is done by utilizing personas a tool. To understand the business goals the opportunity was created to further clarify the context of use as stated in chapter 3.3.

Persona descriptions can include several characteristics but the most common are name, image of the persona, challenges, motivations, goals, tasks or behaviour (Goodwin 2009 602). Personas can be used to visualize a user journey. Personas can also be used to draw user journey maps for different persona types (Schneider & Stickdorn 2010, 151-152). In user journeys, personas make it possible to empathize with the users experience and understand the issues they are facing (Griffin et al 2015, 1l). This makes service development more user-centred and less reliant on the designer's assumptions of the user.

Personas can be created by using different tools. The first phase is to define whether we want to gain understanding of different user types or focus on defining only one. The second phase is to gather data on the users. Interviews are the most commonly used tool to gain this information. The interviewee can be the customers or other stakeholders that have insight about the customers. Interviewing customers can in some cases give an unrealistic picture of the persona as customers themselves are often unaware of their own motivations and needs. Once the data is collected it needs to be put into insights and then combined into personas. (Lowdermilk 2013, 2; Griffin et al. 2015, 1n)

Company X's self-help portal was first launched in 2017 and no persona related user research had been done for the company X's main website or the self-help portal. The information and understanding in company X of their self-help portal user types was limited. Existing personas in company X were based on target consumers created by the company's marketing department (company X 2018). These personas did not serve the customer service department's needs as such, as they did not reflect the self-help portal users but on a higher level the company's target consumer group. In this thesis, personas were created to gain insight into the different user types and their motivations and needs. The goal was to get answers for the two supporting development questions; Who the users of the self-help portal? What are the issues

with the self-help portal User Experience currently? Persona creation was also needed to complete persona specific usability testing and to create a user journey map.

Empathy maps are a way for gaining insight about the user when there are no prior studies available, as in company X's case. An empathy map aims at understanding how the users think, feel, say and do things. The empathy map template (Figure 9) was chosen for this thesis as it is based on User Experience point of view. The selected empathy map also provided the data needed in following the UCD and UX development processes, understanding the goals and specifying characteristics of the users. The empathy map helped in understanding what kind of tasks the users are trying to complete when contacting the customer service or using the self-help portal, what or who they are influenced by, overall goals, pain points and feelings during the interaction. (Schneider & Stickdorn 2010, 121; McElroy 2017; Cao 2018.)

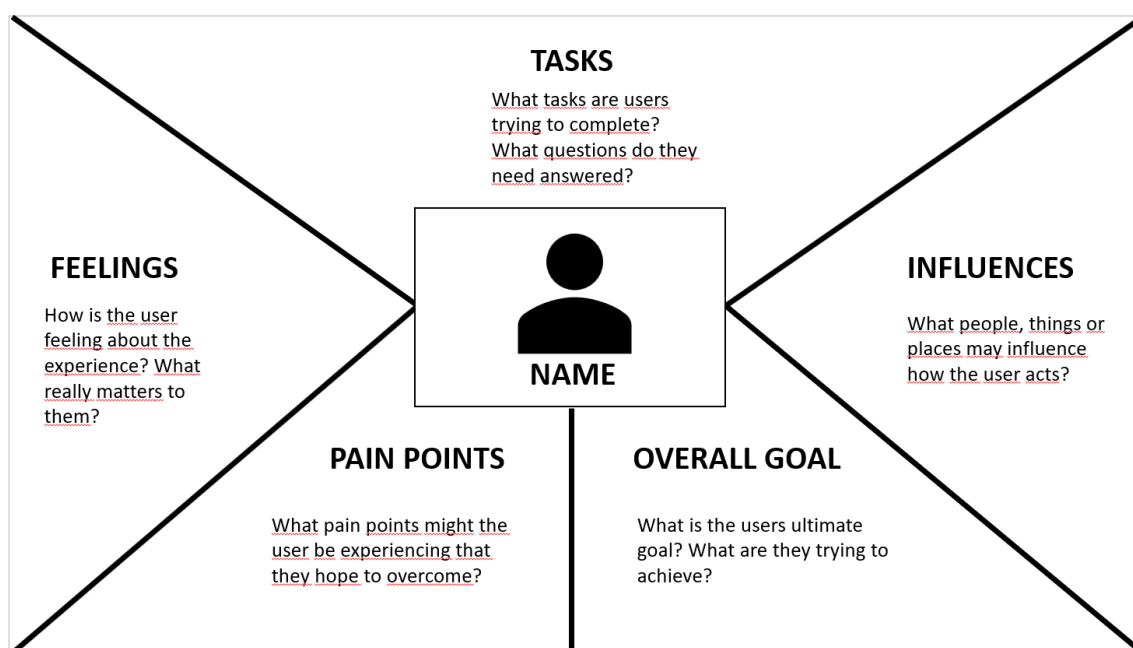


Figure 9 Empathy map for User Experience (Boag 2015)

Eriksson & Koistinen (2014, 30) state that interviews are a common method used in case studies. In this thesis user personas were created by interviewing four company X's customer service agents. The agents have insight into the issues and drives that different customers have. They have first-hand knowledge about how the customers react and what kind of information they are looking for. Company X's customer support agents got to volunteer to participate in the interviews. They were interviewed individually. The interviews were conducted via Skype as the interviewees were in different countries. The interviews were recorded with a voice recorder. The interview responses were handled anonymously to encourage the agents to ex-

press their views freely. Customers were not interviewed to avoid collecting data that reflects the customers opinions rather than truly reflecting the motivations and issues of the customer.

Szabo (2017, 78) states that interviews for persona creation should be as informal as possible. Interviewees were told to freely describe user persona types that came to their mind, including possible characteristics. The writer of this thesis was the interviewer and the interviews were facilitated using the topics of the empathy map; tasks, influences, overall goal, pain points and feelings. No predefined interview question battery was used. With empathy maps, the interviewers' role is to facilitate the conversation with the different topics from the empathy map, it gives the interviewee a non-fixed space to express their own views and opinions. The interviewer is not leading the conversations or affecting the opinions of the interviewee. Empathy maps make the interview data easily comparable. (Cao, 2018.)

3.4.2 Website usability testing

Usability testing is a method for understanding possible shortfalls with usability (Ovaska et al. 2005, 187). Usability tests can give an insight into how actual users are using a website. Usability testing focuses on collecting objective information that can be used in developing usability (Ovaska et al. 2005, 187). Usability tests are part of understanding User Experience, but as such are meant for testing specific pre-set user tasks and not the overall User Experience at once (ISO 9241-11). They give the possibility to identify and fix issues rapidly, which can lead to cost savings. Usability tests are always completed with predefined tasks for the participants to complete and with a limited number of testers. In addition to collection data via tasks, testers can be observed or interviewed to gain more insight into the issues. Participants can be encouraged to share their thoughts out loud while testing and observed in the room while they are completing the tests. (Kuniavsky 2003, 9-10; Ovaska et al. 2005, 187-189; Shneiderman & Plaisant 2010, 144-148.)

On a self-help portal usability testing is a crucial part of User Experience design and development. Usability tests give immediate feedback on usability issues on a website (Kuniavsky 2003, 259). In company X's case, user acceptance testing had been done when the portal was first launched in 2017, but usability testing had not been done. Usability testing was chosen with the company X representatives as one of the methods used in this thesis, to understand more specific technical issues with the website. The goal was to answer to the development question "What are the issues with the self-help portal User Experience currently?"

Kuniavsky (2003, 9-10) states that four steps should be taken to complete usability testing. The first is to define the audience and their goals. The second one is to create tasks that address those goals. The third one is to get the right people and the fourth one is to watch them try to perform the tasks. Similarly, Kraft (2012, 57) identifies comparable steps of usability

testing to develop and innovate with usability test results. Kraft (2012) proposes that identifying users and their central tasks, possible future core tasks and solutions to these tasks are the first steps. Next is to evaluate the solution and innovate new solutions. Documenting and analysing the results is the last step. Kraft emphasizes that understanding the very basic functions and their usability should be always tested first. According to ISO standard on usability (ISO 9241-11) describing the goals for the website is the first step of measuring usability. The second one is understanding the context of use; who the users are, their tasks, environment and equipment. The third is to select how to measure the usability through effectiveness, efficiency and satisfaction. (ISO 9241-11; Kraft 2012, 57.)

The goals or the opportunity for the whole self-help portal had been described as the first method in this thesis, as stated in chapter 3.3. User personas were also created prior to completing the usability tests (chapter 3.4.1) to understand the users and their goals. User descriptions should be created before completing usability testing (ISO 9241-11; Ovaska et al. 2005, 187). Usability testing is the second phase of iterative UX process as well as UCD design process. The define phase of the UX development process includes understanding technological issues as well as creating user journeys.

The data (company X 2018) showed that 71% of users visiting the self-help portal were first time company X product users and that the most searched topics were how-to videos and user guides. When the information was analysed from the opportunity, the personas and from company X's customer data, the most prominent user for the self-help portal was recognized. The most prominent self-help portal user persona was chosen for the usability testing.

The already existing customer X's customer feedback and data showed that users overall are having difficulties finding the information they need (company X 2018) in the self-help portal. Out of the overall negative feedback (company X 2018) 97% included the users not finding what they were looking for. A closer look into the search experience of the portal, as well as the portals information architecture was needed. Usability test tasks were therefore created to be focused on the search and navigation aspect. The usability testing tasks are described in Figure 10. Four features were selected with each feature having one task to complete. The features for usability testing are search engine, software updates, app and product page/popular support topics. The usability test features (Figure 10) were selected based on goals that came up from the selected persona (ISO 9241-11; Kuniavsky 2003, 9-10; Kraft 2012; 57) and from company X's existing knowledge of this type of user. The tests were conducted with testers with the main idea of "New user trying to understand how to get the most out of the product". This description came from what the selected persona is trying to complete. (Nielsen & Norman Group, 2014.)

Feature	Task
Search engine: Can the users find specific product content?	You have bought the new Product X. How would you find information on the site to get started with the device?
Software updates: Can the user find instructions to update software?	You've used your device for a while and seen that your software needs to be updated. Where could you find the information and do you understand what you need to do to complete the update?
App: Do people understand that it can be used with Product X?	You want to get the most of your device and know that there is an app that you could connect your device to. Where would you look for information about the app?
Product page/Popular support topics: Do the users find specific technical information?	You've been using the device for a while and want to know more about how steps are counted. Where would you look for specific information about Product X step counting? If you find the information, do you understand the response?

Figure 10 Usability testing tasks (Goodman et al. 2012, 286-287)

A specific company X product was selected for the usability tasks together with company X's customer support team. Company X data (company X 2018) showed that product X was the most searched product in the self-help portal. Product X was also the most likely to be used by the selected persona and was therefore relevant for the testing. The testing was done on the company's global site version which is in English language. The global site was chosen as the scope of the testing was not on individual cultural or specific linguistic issues.

Tests were conducted with four testers who reflected the selected persona type. All of the testers used the same desktop computer and completed the testing at different times. Testing was done anonymously. Desktop computer was chosen as the device for all testers since the number of testers was small and the context of use in terms testing with different devices and environments would not be relevant during this usability testing.

Observation was used as an additional method during the usability testing. Observation was done by the thesis writer while the testers were performing the pre-set usability tasks. The observations were documented as notes. Aspects that were observed were user journey for task one, speed of task completion and amount of errors while completing tasks. The goal of the observation methods used were to understand the effectiveness, efficiency and users' satisfaction. Observing the time to give more insight on the efficiency. Observing possible errors information about effectiveness. Documenting a user journey to show users satisfaction

through the testing, the positive and negative feelings. (ISO 9241-11; Tullis & Albert 2013, 81-86.)

Time for task completion and amount for error were observed in a scale from 0 to 3. This scale was chosen as the number of testers was small and a more specific time and error data collection wouldn't have given a statistically significant result. For time, the scale consisted of 0-failed, 1-succeeded very slowly, 2- succeeded a little slowly and 3-succeeded quickly. The scale for amount of error was 0-failed because of errors, 1-many errors, 2-some errors, 3-few or no errors. The time and error tables are pictured in table 1 and table 2. (Goodman et al. 2012, 314-316.)

3.4.3 Mapping a user journey

User journey map is a method used for visualizing a user's path and experience through a service (Szabo 2017, 74). A user journey map includes touchpoints which reflect the interaction between the user and the website. Recognizing these touchpoints is the basis for drawing the journey. Identification of touchpoints can be done for example through interviews, by observing the user's behaviour, collecting data from social media discussions or using online analytics to follow user behaviour. This information is also called user insight. (Schneider & Stickdorn 2010, 151-152.)

In user journeys, personas make it possible to empathize with the users experience and understand the issues they are facing (Griffin et al 2015, 11). Szabo (2017, 76) states that user journey maps should always related to a persona. This makes service development more user-centred and less reliant on the designer's assumptions of the user. It also helps in empathizing with the user. User journey maps can give an overall idea of the aspects influencing User Experience. (Schneider & Stickdorn 2010,152-154; Szabo 2017, 74-75)

Defining user journeys is part of the second step of the iterative UX process together with usability testing (Chesnut & Nichols 2014, 237). User journey mapping was chosen as a method for this thesis as it gives an insight into the websites User Experience and works as a tool to be used with other teams to visualize possible issues with the website. The goal was also to gain an answer to the development question "What are the issues with the self-help portal User Experience currently?". No user journey maps had been done of the self-help portal prior to this thesis. User journey mapping was conducted for this thesis by observing usability testers while they were doing usability testing feature number one task. Only one user journey map was decided with company X to be drawn, as only the writer of this thesis was observing the testing and concentrating on one user journey gave a more accurate result than completing several. The goal was to understand the user journey as well as the positive and negative feelings that the user was experiencing while completing the journey. This gives insight into User Experience within the self-help portal especially in terms of information architecture

and interaction design. The journey was documented by observing the positive and negative feelings of the usability testers and the touchpoints where they happened. The testers were encouraged to express vocally their feelings during the testing. The journey was later visualised in digital format.

3.4.4 Customer feedback and data

Already existing company X customer feedback and data was used in this thesis to give more insight into current issues with the self-help portal and to support usability testing task selection. Company X provided customer feedback and data that was collected during February and March 2018 as a survey from the self-help portal users and Support Section statistics from March 2018. The feedback and data had been collected using iPerceptions customer experience management software, Google Analytics, Hotjar analytics and feedback tool and other sources that were not specified by company X.

The feedback and data were utilized when assessing the overall User Experience. Existing target consumer descriptions were used to understand the current status of persona descriptions in the company. How the existing consumer descriptions have been created was not disclosed by company X.

3.5 Analyze & Share

Eriksson & Koistinen (2014, 33) propose that analysing the collected data in a case study consist of three parts; classifying or organizing the data, analysing its contents and interpreting the results. The results are given explanations and require making connections between the findings (Eriksson & Koistinen 2014, 33). Yin (2011) proposes a similar model which includes five steps: compiling, disassembling, reassembling, interpreting and concluding. Several methods can be used when analysing the results of a case study, these include coding, categorization, pattern matching, time-series analysis, explanation building, protocol analysis and creating large matrix tables (Swanborn 2010, 114-125).

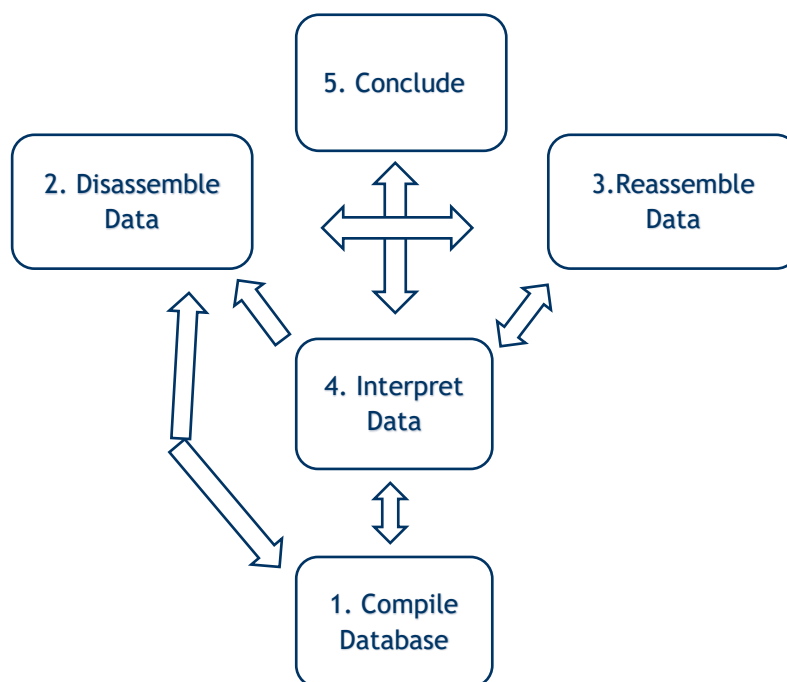


Figure 11 Five phases of analysis and their interactions (Yin 2011, 178)

Yin's (2011) model of Five-Phased Cycle for qualitative data analysis was used in this thesis as the analysis process. The analysis process is described in Figure 11. The first phase of the cycle is compiling a database, this includes sorting the collected data into an order. Disassembly phase includes coding or in other methods sorting the data into smaller pieces. There might be a need to go back to the initial sorting and then disassembling the data several times. Once the data is disassembled it will be reassembled, put into larger groups. In this stage the data can be put into a visual format such as tables or charts. The fourth phase includes interpreting the data. When the data is interpreted there might be a need to go back to reassembling or disassembling it. Once the interpretations are ready the next phase is making conclusions. The final phase incorporates making conclusions about the whole study. (Yin 2011, 178-179.)

In this thesis a digital archive was created by the thesis writer to store all the collected data. The existing feedback and data from company X was stored in the archive. The handwritten notes from the opportunity definition workshop were put in a digital format. The notes from the persona interviews were transcribed. The notes from the usability testing and usability testing observation were written into digital format. Three iterative disassemble, reassemble and interpretation rounds were needed to process the data. Iterative rounds were completed after persona interviews, after the usability testing and finally after the interpretation for the opportunity, personas, user journey and usability were complete. All the aspects needed to be looked at in order to understand the issues with User Experience and to be able to choose relevant User Experience metrics to be used for the self-help portal. The conclusions were made after all the data was interpreted, reflecting on the theoretical framework.

The emphasis in the analysis should be in gaining the answers for the set development questions (Saaranen-Kauppinen et al. 2009, 73-74; Swanborn 2010, 114). The data collected in this thesis was analysed to see which development questions would be relevant for which data. One data set did not reflect one development question, rather the different data sets complemented each other.

The opportunity data differs from the other data collected. The opportunity was defined as such in the workshop and already in the design phase of the thesis. Disassembling or reassembling the data was not necessary or possible afterwards. The opportunity was analysed together with the other data sets after they were collected.

Coding was used in sorting the persona interview answers. Similar persona descriptions were sorted by colour. The coded data was then analysed by using thematic analysis. Thematic analysis was used to find similar themes in the data, in this thesis to find possible user personas. Behavioural and demographic variables were searched from the interview answers to formulate personas (Goodwin 2009, 632-633). The interview answers showed that there were three similar personas described by all the interviewees. These three were chosen to be created into persona descriptions. The personas were named in order to describe them better. Characteristics of the personas were searched from the data and described in a figure. Goals, influencers, tasks, pain points and feelings for each persona were compiled into the empathy map format that was used in the interview. (Saaranen-Kauppinen et al. 2009, 109-110; Yin 2011, 187-188.)

Ovaska et al. 2005 (196-197) state that usability test results are not an efficient development method if the results are not analysed thoroughly. The biggest issues that come up during usability testing can be seen in the data without a lot of analysis, this is also the reason why usability tests can be used as a quick resolution in finding and fixing issues. Thematic analysis was also used in interpreting the usability test results. The notes from the usability testing were sorted into categories according to the usability test tasks. The data from the time to complete and errors in the website were put into table format to show the results per tasks and per tester, the average score was added to compare the different tasks. Recommendations to fixing the usability issues were defined after the analysis was done. (Ovaska et al. 2005, 196-197.)

The last phase in Yin's model for case study research is sharing the results. The goal of this phase is to present the results to the relevant stakeholders. Yin divides this part into three parts; composing, presenting and reporting. Writing of the thesis started already before the sharing phase but the composition for presenting the results started afterwards. The audience for the results was the company X customer support representatives. The communication of results was planned to fit this audience. The results were composed in a short and efficient

manner, understanding that the audience had a limited time to hear a relatively large amount of new information. Presentation of the results was planned so that the theoretical framework was introduced shortly, and the main emphasis was on the results. The main terms were explained to ensure that the audience understood them. Storytelling was utilized during the presentation of the user personas and user journey map. The reporting phase was completed by assessing the overall findings with the theory and overall assessing the thesis report and proofreading it. (Yin 2011, 255-256.)

4 Results

This chapter describes the results of the development work, answers to the objectives and development questions of this thesis. In the development work the goals were defined and visualized into an opportunity. User personas were created based on stakeholder interviews. Usability testing was completed, and a user journey map was drawn based on observation during the usability testing. The results support the purpose of this thesis to understand the current User Experience within company X's digital self-help portal. The results are based on following first steps of the iterative UX development process (Chesnut & Nichols 2014, 237) and UCD activities (ISO 9241-210).

4.1 Opportunity of the self-help portal

The opportunity or goal for the self-help portal is visualized in Figure 12. The main goal that was set in the workshop by company X representatives for the self-help portal is that the customers have "No need to contact" the customer support. This means that the customers find the information that they need on the company's self-help portal which relieves the pressure on the company's other support channels. To understand how the goal would be accomplished the opportunity was put into a question format. The question was "How to make the customer happy without contacting us?". Us in this case refers to the customer support of company X.

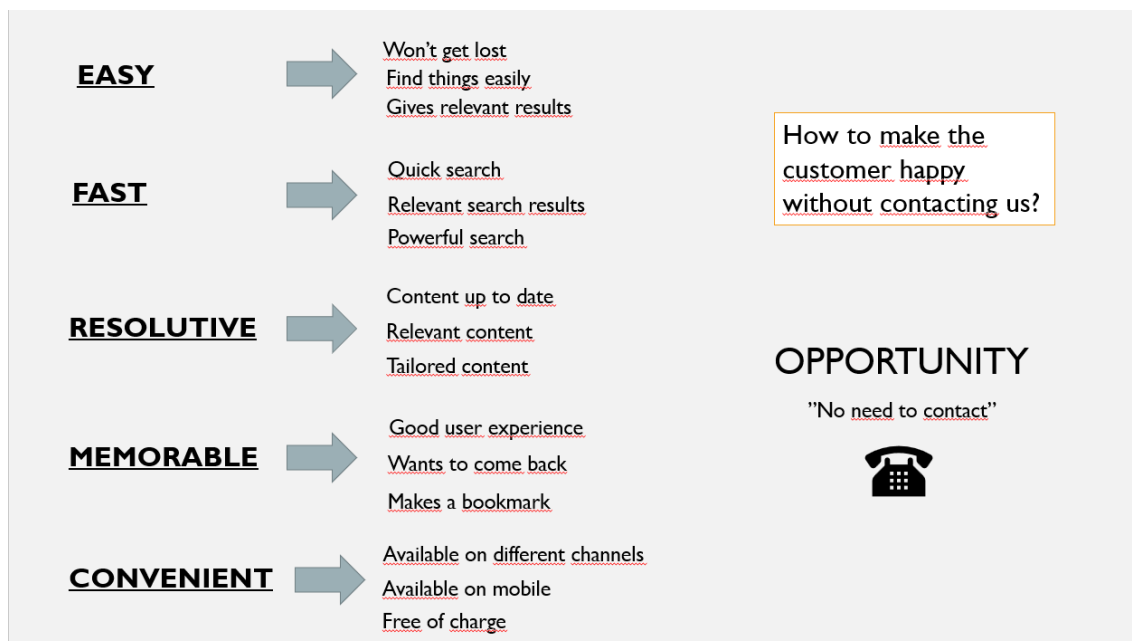


Figure 12 Self-help portal opportunity (Tiira 2018)

Fifteen different outcomes were defined by company X representatives as a response to what the self-help portal UX should be like to make it possible for the customer to be happy without contacting customer support. The outcomes are presented in Figure 12. These outcomes were categorized into five different objectives for the self-help portal by the thesis writer. The objectives are that the self-help portal is easy to use, fast, resolute, memorable and convenient.

The objective of easy means that the users won't get lost, they will find things easily and the website will give relevant results. Fast includes that search is quick, it gives relevant results quickly and that the search is powerful. Resolute objective means that the content on the website is up to date, the content is relevant, and the content is also tailored to the user. Memorable includes a good User Experience, the user wants to come back and makes a bookmark of the website. The last objective is convenient which means that the self-help portal is available on different channels, its available as a mobile version and is free of charge to the users.

All in all, the opportunity emphasizes the importance of the search function on the website as well as effective content management and that the overall User Experience is positive for the user. These areas reflect the three factors of usability defined by ISO 9241-11, efficiency, effectiveness and overall satisfaction.

4.2 Self-help portal user personas

Three personas were created based on customer agent interviews. These three types were clearly described by all four interviewees and could hence be defined to be the most common ones. Descriptions of other possible user types were also discussed, but as they remained very limited in terms of specifications, only the three were chosen to be created into personas.

The three personas are described in a persona overview image which define the personas characteristics, age and sex. Each persona description was created based on the User Experience empathy map used in the interviews. The personas include the specific personas tasks, overall goals, pain points, influences and feelings. Personas were given fictional names to make them more realistic and easier to relate to. All of the three personas use company X's devices to track and record their sports activities.



Figure 13 Persona 1: Goal Oriented Expert (Tiira 2018)

Persona 1 (Figure 13) is the Goal Oriented Expert. This persona is Martin, he's a male and age 36 years old. He is very passionate, goal oriented, sports oriented and can be called and expert of his sport. He runs ultras, full marathons and is a tri-athlete. As a persona he doesn't accept mistakes and expects perfection from company X's devices and services. It is important for him to be an insider and part of company X's so-called family.



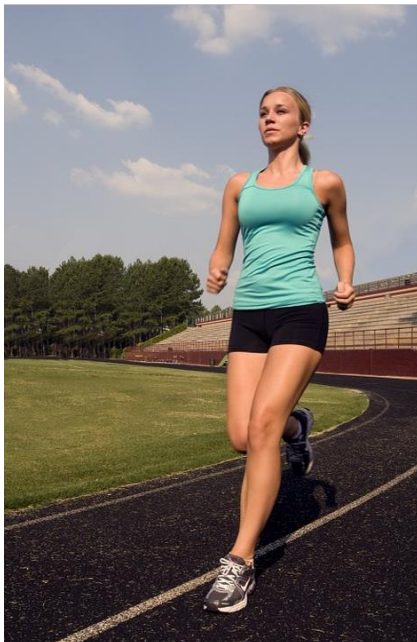
Figure 14 Empathy map for Persona 1

Figure 14 describes the empathy map of persona 1. Persona 1 tasks are to solve tiny errors that he has noticed when using his device, to give feedback, seek resolutions from company X to issues they have already looked for answers, find out detailed information about new device features, talk to company X technicians or find a solution on why he has lost important sports trainings.

Persona 1 is influenced by company X's brand. He follows sports forums and is influenced by other athletes. He has the need to be part of company X's brand community and to "be on the inside". The overall goal for persona 1 is to use the services that he has bought with the device and he expects a lot from the customer support he is contacting. He wants to receive value for his money. He also wants to trust company X as the expert in solving his issues.

Pain points for persona 1 are that he doesn't want a lot of exchange with customer support. He needs an empathetic listener who will convince him that his problems will be solved. Persona 1 can be difficult for the customer support agents to assist as the training distances are extremely long and customer support agents need to set their selves into the customers shoes. Persona 1 feels that if the device he has bought doesn't work 100% of the time it will make him distrust the company and the brand.

Persona 1 is often desperate, frustrated and annoyed when he contacts customer support as he has already researched the issue and tried to solve it himself. He has big expectations for the service and can be impatient in getting answers. At the same time, he understands that the questions he has are very technical and often might take time to solve.



**PERSONA 2:
NON-TECHNICAL ATHLETE**

- Heather
- Female, 30 yo
- New company X customer
- Not really training for results, but for liking what she does
- Passionate but doesn't have the drive for proving herself and being on top
- Runs long distances and does other sports -> to get better not extremely better

Photo source: <https://pixabay.com/fi/juoksija-koulutus-sovitaa-808932/>

Figure 15 Persona 2: Non-technical athlete (Tiira 2018)

Persona 2 (Figure 15) is the Non-technical athlete. Her name is Heather and she is 30 years old. She is a new company X customer. She doesn't train for results but for liking what she does. She is passionate but doesn't have the drive for proving herself and being on the top of her sports. She runs long distances and does other sports to get better at them but not extremely better.

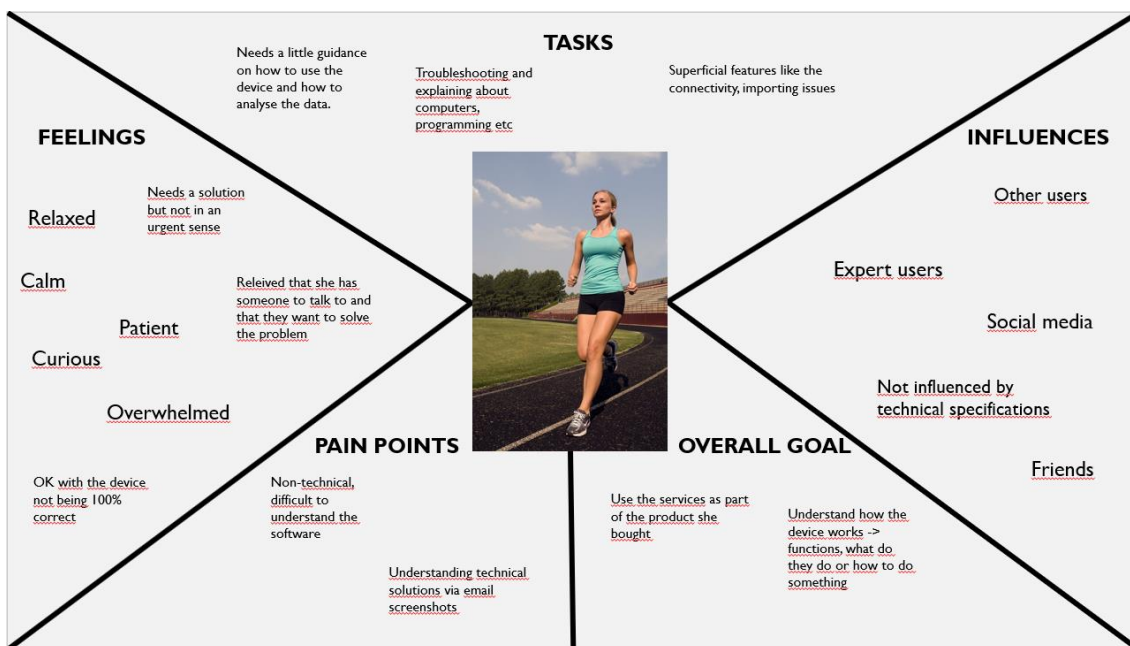



Figure 16 Empathy map for Persona 2

Figure 16 describes the empathy map for Persona 2. Persona 2 tasks are to get a little guidance on how to use the device, how to analyse data on the device, do troubleshooting and gain information about connectivity and other superficial issues. Persona 2 is influenced by other device users, social media, friends and expert users. She is not influenced by technical specifications of the device.

Persona 2 has an overall goal to use the services as of the product that she bought and understand how the device works. Her pain points are that she is a non-technical person and it is difficult for her to understand software. Her overall feeling is relaxed, calm, curious, patient and overwhelmed. She needs solutions for using the device, but she is not in a hurry to get them. She is ok if the device doesn't function hundred percent of the time.

**PERSONA 3:
LOYAL MEMBER OF THE
COMMUNITY**



- Caleb
- Male, 60 yo
- Long history with company X with several devices
- Buys company X's products because they are company X's -> trusts in company X
- Member of the company X community
- Confident -> sometimes stumbles upon something he hasn't seen before

Photo source: <https://pixabay.com/fi/cave-diver-paineilmalaitteet-2933425/>

Figure 17 Persona 3 Loyal member of the community (Tiira 2018)

Persona 3 is the Loyal Member of the Community (Figure 17). His name is Caleb and he is 60 years old. He has a long history with company X using several of their devices. He buys company X products because they are company X products, he trusts in the company. He is a member of company X community. He is a confident person but sometimes stumbles upon something in the device that he hasn't seen before.

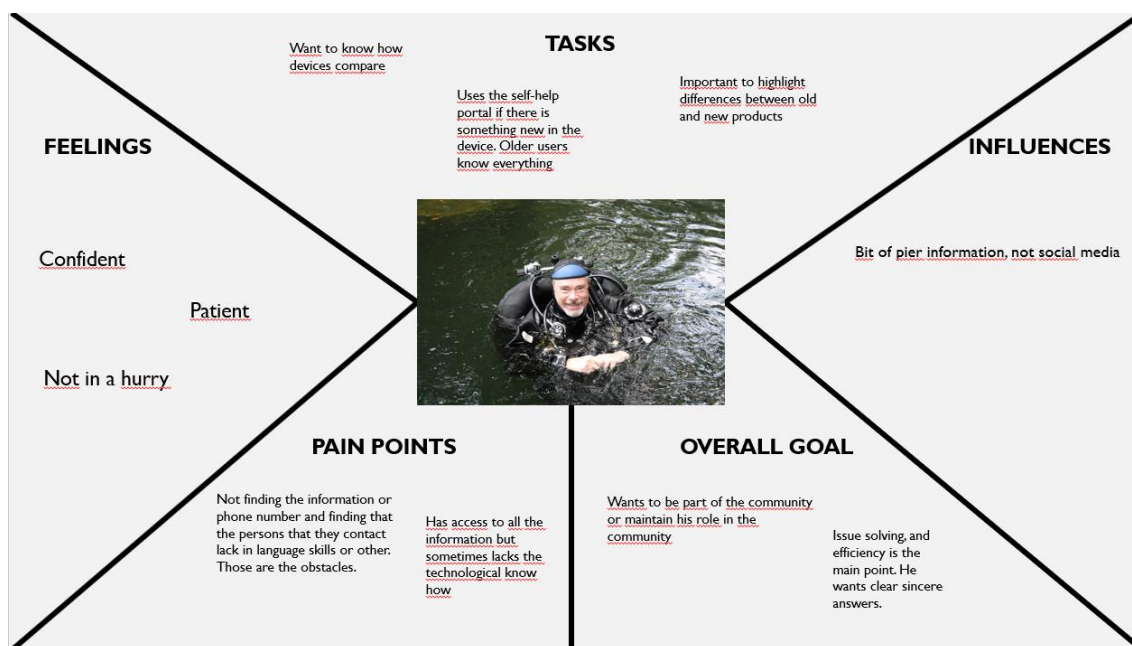


Figure 18 Empathy map for Persona 3

Figure 18 describes the empathy map for Persona 3. His tasks are to get information on how different compare to each other. He uses the self-help portal if there are new features on the device. He wants to know the differences between old and new products. He is influenced only by a bit of pier information but not by social media. His overall goal is to be part of the company's community and maintain his role in it. He wants clear sincere answers efficiently if he has an issue to solve. His pain points are not finding the information that he needs or that customer support doesn't speak his language. He has access to all of the information but might lack technological know-how on some issues. He is feeling confident, patient and he is not in a hurry to find answers.

As a conclusion of the personas, persona 2 was seen as the most prominent self-help portal user group and was chosen to be used in usability testing. Persona 1 was not chosen as the persona is very technically oriented and needs very specified answers to his questions which normally require one-on-one technical expertise from the company. He is impatient which means that he most likely won't spend a lot of time searching for information on a website, he would rather call or email customer support. Persona 3 was not chosen as this persona does not have many issues with his devices and rarely searches for solutions. Testing the portal with this persona would be irrelevant as he represents a very small user percentage.

Persona 2 was chosen as she represents a new and young user who wants to find information. She is in her thirties and is used to finding information online. She is not in a hurry and tries to find the answers first by herself. She is a prominent user for how-to videos, troubleshooting content and general content on the device use. After the persona 2 was defined to be the

most prominent user group she was chosen as the persona for usability testing. Four testers who reflected persona 2 description were recruited to do the usability testing. The usability test tasks were defined to reflect the tasks that the persona is trying to solve. This includes finding product content and finding instructions on how to use the device.

4.3 Usability

As stated in the previous chapter, four users were recruited for the usability testing. The writer of the thesis observed two factors during the testing; time to complete the tasks and errors. Other usability issues were also documented by the thesis writer. The time and error results are shown in table 1 and table 2. The results are sorted by task and by tester. The average score for each task is shown. A score of 0-3 was used, as described in more detail in chapter 3.4.2.

<u>Time to complete</u>					
<u>Feature</u>	<u>Tester 1</u>	<u>Tester 2</u>	<u>Tester 3</u>	<u>Tester 4</u>	<u>Avg.</u>
<u>Search engine</u>	3	2	1	2	2.0
<u>Software updates</u>	2	1	1	2	1.5
<u>App</u>	1	1	1	2	1.25
<u>Product page/Popular support topics</u>	3	2	2	2	2.25

0. Failed
 1. Succeeded very slowly
 2. Succeeded a little slowly
 3. Succeeded quickly

Table 1 Usability test for time to complete

The time to complete data (Table 1) showed that on average the search engine task was successfully completed a little slowly (average 2.0), only one tester was very slow in completing the task. The software updates task was successfully completed with an average of 1.5. The app task was the slowest to complete with an average of 1.25. The last task of product page/popular support topics was the fastest to complete with an average of 2.25.

Errors

<u>Feature</u>	<u>Tester 1</u>	<u>Tester 2</u>	<u>Tester 3</u>	<u>Tester 4</u>	<u>Avg.</u>
<u>Search engine</u>	2	1	3	2	2.0
<u>Software updates</u>	1	1	2	1	1.25
<u>App</u>	2	1	2	1	1.5
<u>Product page/Popular support topics</u>	3	2	2	2	2.25

0. Failed because of errors
1. Many errors
2. Some errors
3. Few or no errors

Table 2 Usability test for errors

The results of the error observation are displayed in Table 2. Any technical problem or issue that made the tester go back to the previous page was considered an error in this testing. The search engine task showed on average some errors during the testing with an average of 2.0, this task had the most variation between the testers amount of errors. Software updates task included the most errors to complete and got the average of 1.25. The app task was the task with the second most error with an average of 1.5. The least errors were seen in product page/popular support topics task with only some errors and an average of 2.25. None of the tasks failed due to errors on the website but the amount of errors noted during the testing showed a clear need for development.

The data that was collected from the usability test contained actual usability issues but also showed problems with the website's interaction design and information architecture. The results from the usability test tasks are presented in Table 3.

<p>Task 1: Search engine: Can the users find specific product content?</p>	<ul style="list-style-type: none"> • The search engine didn't always give the product page as the most relevant solution. • The testers found it relatively easy to find a how to get started video when on the product page but viewing the video on a PC as the embedded size caused some difficulties. Enlarging the video to full screen helped, but some users didn't understand to use and ended up viewing it in Youtube. • Testers thought that the setup of the device was ready when the task was completed, there is no logical path leading to f.ex updating software
<p>Task 2: Software updates: Can the user find instructions to update software?</p>	<ul style="list-style-type: none"> • A lot of search engine difficulties to find relevant information • Testers were misled by the article title. They could not understand the connection of link to software update until reading the text after the title. • There was confusion about software X download link leading to a separate site.
<p>Task 3: App: Do people understand that it can be used with Product X?</p>	<ul style="list-style-type: none"> • There was a lot of search engine difficulties to find relevant information (search result ranking) • Testers couldn't find information if their phone was compatible with the app.
<p>Task 4: Product page/Popular support topics: Do the users find specific technical information?</p>	<ul style="list-style-type: none"> • Article was found relatively easily • Some testers were still uncertain what is calculated in the device. What could be the reason if amounts are not correct? • Getting to the product page was easy since the tested product X is shown second in the main page list.

Table 3 Results of usability test tasks (Tiira 2018)

The results of the usability testing showed several issues with the websites search engine. It didn't give relevant results. Testers were overwhelmed over the search engine. Some of the

issues were that the most relevant content was not shown at the top of the search list or that the content was not found with the keywords used by the testers. The usability of the search engine affected the most to the time to complete the tasks. There was confusion about different search results in the search on the self-help portals main page versus the product page.

There were some issues with navigating on the website. New users, which the tester group presented, were easily confused because of the lack of clear connection between different content. Some of the article titles were long which made the testers skip the right articles. The search issues together with the navigational issues lead to errors which explains why none of the tasks were completed quickly by any of the users.

Overall the feedback from the testers during the usability testing was that the website gives the feeling of company X brand, but the usability issues and difficulty to find right content was unpleasant for the testers. Most of the testers thought that the problem might also be with their own skills, as they represented a non-technical persona, and that might lead them to contacting the customer support.

4.4 User journey map

The user journey map (Figure 19) was drawn from the first usability test task. The goal was to test if the user can find specific product information. The task was “You have bought the new Product X. How would you find information on the site to get started with the device?”. The user journey was created by observing the four usability testers and tracking their emotions during the testing. Testers were also encouraged to give feedback while they were completing the tasks. Results from the four testers were combined into one user journey map. The user journey (Figure 19) has been divided into positive and negative experience. The circles on the user journey map show how the users are feeling. The map shows the different touchpoints that the testers had with the self-help portal while completing the first task.

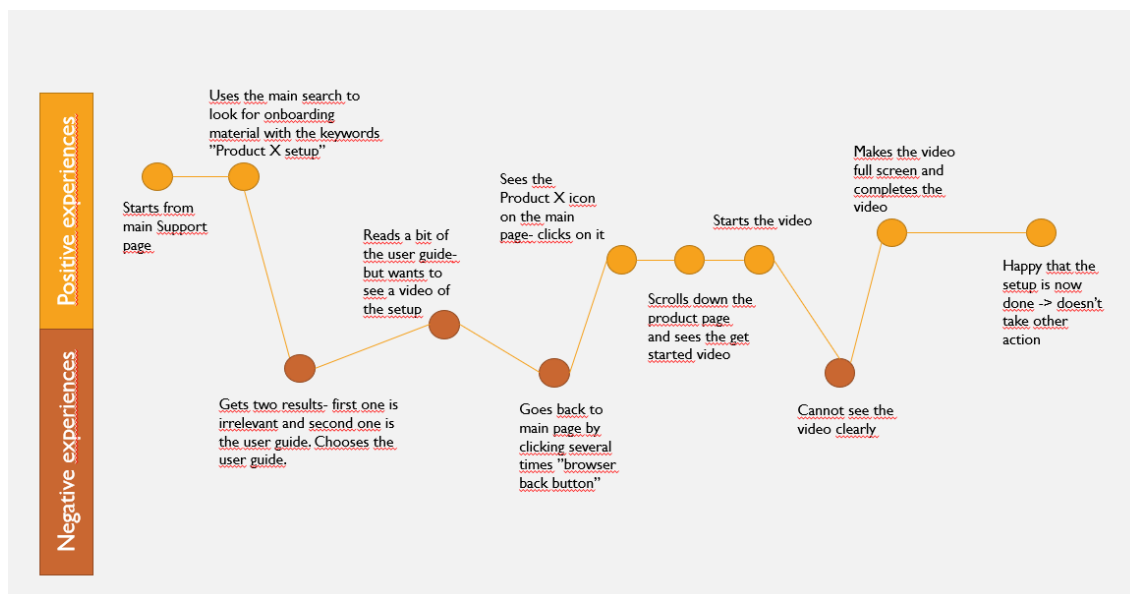


Figure 19 Self-help portal user journey map (Tiira 2018)

The user journey started from the support page, the user uses the main search to look for onboarding material with the keywords “Product X setup”, the user is feeling very positive at this point. The user gets two results from the search engine. The first one is irrelevant and the second one is the user guide. The user chooses the user guide. The experience leaped to the negative side when the search engine did not give relevant results as the first choice. Next the user reads a bit of the user guide but wants to see a video of the setup. The user goes back to the main webpage by clicking several times “browser back button”. At this point the experience is continuing to be negative for the user. The user then sees the product X icon on the main page and clicks on it, the experience has come back to positive. The user scrolls down the product page and sees the get started video and starts the video. The user cannot see the video clearly which brings the experience back to negative. The user makes the video full screen and completed the video. The user is now positive again and is happy that the setup is now done, she doesn’t take any other action.

The user journey map shows that the User Experience was very inconsistent throughout the testing. The user went from positive to negative several times. Even though the experience was positive at the end the overall experience cannot be said to be positive. There was also usability, interaction design and information architecture related issues such as finding the relevant content, navigational issues and technical issues.

4.5 Suggestions for improving and measuring user experience

The iterative UX development process (Chesnut & Nichols 2014, 237) and UCD activities (ISO 9241-210) were not fully implemented in this thesis. Due to the scope of this thesis and the timeline for completing the data collection, it was not possible to implement the suggestions

mentioned in this chapter. This means that verifying the possible positive changes in the self-help portal user experience was not possible. This should be considered when evaluating the results. This chapter proposes answers to the main objective of this thesis which was to produce suggestion on how overall User Experience could be improved and how User Experience could be measured.

The data from the company X's feedback (2018) and from usability testing and user journey map showed that the overall User Experience leaned more into the negative than the positive. It should be noted that this thesis included limited usability testing and user journey mapping. As the usability testing included observation by the thesis writer, having multiple testers was limited. Even though the results give an idea about the status of the User Experience and show an example of a user journey they do not represent the status of the whole website. A more consistent full iterative UX process and iterative usability testing would be needed to gain more insight.

One of the biggest issues with the portal was the usability of the search function. This was shown both in the usability testing as well as in company X's own data. The results showed that the search function was such a big problem that by concentrating in developing it the overall UX can be improved. The search function relates to the information architecture on the website. In Russell-Rose & Tate's (2012, 1-2) model of Search User Experience, the first three steps were to understand who the users are, what are their goals and what are they influenced by. This information was made available for company X by creating the three user personas. The last step was to ensure that the users can complete their user journey. This requires an efficient search on the website.

Different analytics tools such as Google Analytics should be used to further look at the issues with the search function. Google Analytics is a tool that is already in use in company X for website analytics. The following aspects are suggestions for improving user experience through improving the search functionality:

- Utilize the keywords that the users are searching in the website contents to give more relevant results.
- The exit rate or refinement rate can be used to see if the user has stopped searching or if they have tried using another keyword for the same search.
- Understanding the different versions of the same search helps in understanding the different terms that the users are using.
- The breadcrumb of the user can be followed in the analytics tool to understand the users' journey throughout the search.

- Users might misspell, use synonyms or otherwise make grammatical mistakes in their search. Often these are individual mistakes but should be looked at to ensure that commonly used “mistakes” give relevant results.
- Developing the search results ranking is a method to pulling up the most searched content at the top of the search results. Keeping the search function on the portal up to date requires consistent follow-up and optimization. This requires allocation of resources.
- Using relevant titles for articles that are easy for the users to quickly understand in the search results list.

The following aspects are suggested to be used to reach the opportunity objectives (Figure 12) of “Memorable” and “Convenient”:

- User-centric development and design -> inclusion of users
- Using personas in all phases of future development. Further enriching the personas
- Focusing on relevant personas not satisfying everyone’s needs
- Doing consistent iterative usability testing
- Utilizing user journey mapping when developing and designing the site navigation.

Creating suggestions of User Experience metrics was the second objective of this thesis. In the theoretical part the topic of measuring User Experience was discussed. The theoretical part showed that metrics are required to follow-up on UX development. Tullis & Albert (2013, 26.) emphasized that the key to measuring UX is the consistency of measuring it. To be able to measure UX the self-help portal required goals and objectives to be created to be able to measure against those goals. This was done in the opportunity workshop. The metrics that are recommended as a conclusion in this thesis were chosen to enable company X to reach the three objectives (Figure 12) for the self-help portal, these are that its “Easy”, “Fast” and “Resolutive”.

These metrics are suggested to be used as KPI’s for the portal. The suggested metrics are precision of search results, usage percentage of internal search, knowledge base usage percentage, pages viewed per session, bounce rate and average time on page. All of these metrics can be accessed through Google Analytics. These metrics tell if the users are getting relevant results, if they are using the internal search of the website, if some of the content is old and should be removed, the users journey through page views, the amount of users that leave the portal quickly and the time that users spend with each content. The aim of these metrics is to

enable company X to keep the content relevant, improve the search function and gain insight to develop user journeys.

To enable the users to give feedback on the content a new rating system can be introduced to each content page. This rating system can be a simple question of “Was this content useful?” with the answer options of yes and no. To understand further the satisfaction level of users, it can be measured with a self-help portal specific NPS questionnaire or a satisfaction scoring questionnaire (5 or 7-point scale). Measuring the whole company X website satisfaction might not give enough detailed information on the self-help portals portion of the site. Therefore, a specified questionnaire is recommended.

These metrics can be utilized to gain insight on the effectiveness, efficiency and satisfaction level (ISO 9241-11). Using a variety of metrics gives a more comprehensive picture of the portal’s User Experience status. Company X’s overall business goals for the whole company X website were not known to the thesis writer while writing this thesis, therefore suggestions for metrics could not be compared to possible other business goals. (Beasley 2013, 3-4; Chesnut & Nichols 2014, 240-241.)

5 Assessment

5.1 Assessment of the development work

The purpose of this thesis was to understand the current User Experience within company X’s digital self-help portal. The objective was to produce suggestions on how overall User Experience could be improved and suggestions on how User Experience could be measured. To understand the current User Experience, defining what User Experience consists of was required. The topic of User Experience was discussed in the theoretical part by describing the elements of User Experience and how it could be developed. The topics of identity design, information architecture, usability and interaction design were discussed in the theoretical part as elements of UX, as they were the most relevant for the self-help portal. It became evident that User Experience is a multidimensional area with many areas that could have been discussed even further or investigated closer in this thesis.

The importance of User-Centred Design philosophy in developing User Experience is apparent. Both the iterative UX development process steps as well as including UCD activities were included in the methodological part to incorporate both aspects. As UCD and UX link closely together they also share similar aspects. Understanding who the users are, what are their and the company’s goals. Understanding the context of use and creating design solutions based on user knowledge.

To understand the current User Experience status of the self-help portal the goal for the whole service was defined together with company X representatives. Defining the goal was

needed both from the User-Centred Design perspective as well as from UX development perspective. It required the company X representatives to think about the goals from the company's as well as the user's viewpoint. This method proved to be crucial in assessing the UX of the website. Without understanding the objectives, it would have been challenging to choose a relevant persona for the usability testing, assess the overall UX results or give improvement suggestions for UX or measuring UX. All these aspects required reflecting against the given objectives.

User personas, usability tests, user journey and existing user feedback were utilized in this thesis to understand the issues and status of the self-help portals current User Experience. The selected methods worked well for the purpose of this thesis. The user personas were especially welcomed and needed by company X as they gave a concrete tool to be shared with other stakeholders involved in the portal development. The results of this thesis revealed issues with usability, information architecture and interaction design. The results also showed that the portal visually reflects company X's brand and feel and therefore has succeeded in identity design.

The data for user personas as well as the usability testing and user journey were collected from four customer service representatives and four usability testers. The amount of the testers and interviewees was limited as the interviews were conducted by using an empathy map and because the usability testing included observation by the thesis writer. The reliability of the results can be challenged due to the limitation on the number of participants. Useful insight was gained by using these methods, but the limitations should be regarded when discussing the overall User Experience of the self-help portal. Even though the chosen methods gave relevant insight into the overall UX of the self-help portal, a different approach is recommended for usability testing to gain a more reliable result for pre-specified tasks. Due to the schedule of the thesis some of the usability issues had been corrected already prior to the usability test results were shared with company X. The purpose and objectives of this thesis were accomplished with the chosen methods.

This thesis was conducted utilizing University of Applied Sciences ethical guidelines for thesis (Arene 2019). The scope, schedule, anonymity and compensation for the thesis were agreed upon with the commissioning company in a development plan. The persona interviews as well as the usability testing were conducted with a high ethical code. The interview responses were handled anonymously to firstly enable the participants to express their opinions freely. The interviewees did not disclose actual customer details such as names during the interviews. The usability testing was also completed anonymously. In the interviews and usability testing cases the data sets were numbered, and the participants names or details were not recorded anywhere. The company X feedback and data and existing customer personas were handled confidentially.

5.2 Recommendations and conclusion

Digitalisation of services will come to touch most businesses. Understanding the importance of User-Centred Design as a competitive advantage in this global landscape is relevant to any company. This thesis has touched the topics of User-Centred Design and User Experience development, both of which can be said to be current and relevant. Applying the User-Centred Design philosophy and improving User Experience of the self-help portal can help company X in saving costs for its customer support, understanding its users better and increasing its number of satisfied customers.

Website development is in most cases a job for several teams within an organisation, this is also the case in company X. User Experience development requires a clear process that is followed by all the stakeholders involved with the service. Measuring User Experience is also part of the process (Chesnut & Nichols 2014, 237). User-Centred Design should similarly be used as a process and philosophy throughout the company for it to be implemented efficiently (Still & Crane 2017; ISO 9241-210). Each team should have the same understanding of users, development process and project schedule. Implementing the user-centred philosophy to the whole organisation is of course a decision for the business management. The main ideas of UCD can still be utilized without the whole organisation committing to it. The most evident and easily accomplishable factor in UCD is involving actual users in testing and developing of the self-help portal. This is also an important part of User Experience development.

It is important that developing the User Experience is not only the customer support teams' responsibility. All the stakeholders involved in the self-help portal need to be committed to improving it. Sharing goals and results and discussing development ideas from different viewpoints, including the users' viewpoint, ensures a clear and efficient development process. The defined opportunity can be used when developing the self-help portal further to mirror if the planned changes to the portal correspond to the objectives. Redefining and adjusting the goals is recommended when necessary. As the objectives were defined with the company X representatives it is recommended, that for future development of the objectives actual users are included in assessing them.

This thesis described that User Experience can be hard to specifically define but has clear elements such as interaction design and usability. User Experience links closely to User-Centred Design and HCI and should be looked at also from these perspectives. As a result of this thesis new tools were created for company X to utilize in the self-help portal UX development. The user journey map as well as the user personas work as a template to be further developed. This thesis has showed that even though the area of UX is vast, it is possible to test it in parts by using relatively easy and comprehensive tools. Going through the full process of UX development (Figure 2) or UCD (Figure 1) were not the focus of this thesis but are recommended to be considered for further studies, if these processes are adopted by company X.

Writing this thesis has been rewarding as it has gained me a new understanding of User Experience and methods to developing it. It has shown that satisfying users in the digital age is not easy, but it can be achieved. It has also revealed the importance implementing the user-centred philosophy throughout the organisation and not only to separate teams or departments. In the end, users are the ones that companies make the services and products for, and it makes all the sense to hear them out and include them in developing them.

References

Printed sources

Arene. Ammattikorkeakoulujen rehtorineuvosto Arene Oy. 2018. Ammattikorkeakoulujen opinnäytetöiden eettiset suositukset.

Beasley, M. 2013. *Practical Web Analytics for User Experience: How Analytics Can Help You Understand Your Users*. Waltham: Elsevier Inc.

Chesnut, D. & Nichols. K. P. 2014. *UX for dummies*. West Sussex: John Wiley & Sons

Cooper A., Reimann, R., Cronin, D. & Noessel, C. 2014. *About Face: The Essentials of Interaction Design*. Indianapolis: John Wiley & Sons, Inc.

Crampton Smith, G. in Moggridge, B. 2007. *Designing Interactions*. Cambridge: The MIT Press.

Dawson, A. 2012. *Future-Proof Web-Design* West Sussex: John Wiley & Sons.

Eriksson, P. & Koistinen, K. 2014. *Monenlainen tapaustutkimus*. Helsinki: Kuluttajatutkimuskeskus.

Garrett, J.J. 2010. *Elements of User Experience, The: User-Centered Design for the Web and Beyond*. Pearson Education.

Goodman, E., Kuniavsky, M., Moed, A. 2012. *Observing the User Experience: A Practitioner's Guide to User Research*. Waltham: Morgan Kaufmann.

Goodwin. K. 2009. *Designing for the Digital Age: How to Create Human-Centered Products and Services*. Indianapolis: Wiley Publishing Inc.

Griffin, A., Luchs, M., Swan., K. 2015. *Design Thinking: New Product Development Essentials from the PDMA*. New Jersey: John Wiley & Sons.

Hassenzahl, M. 2003. The thing and I: understanding the relationship between user and product. In Blythe, M., Overbeeke, C., Monk, A.F., & P. C. Wright, *Funology: From Usability to Enjoyment* (pp. 31-42). Dordrecht: Kluwer Academic Publishers.

Helander, M.G., Landauer, T.K & Prabhu, P. V. 1997. *Handbook of Human-Computer Interaction*. Amsterdam: Elsevier Science B.V.

Hirsjärvi, S. & Hurme, H. 2008. *Tutkimushaastattelu: Teemahaastattelun teoria ja käytäntö*. Gaudeamus Helsinki University Press

- ISO 9241-11. 1998. SFS-EN ISO 9241-11. Ergonomic requirements for office work with visual display terminals (VDTs). Part 11: Guidance on usability. Helsinki: Finnish Standards Association.
- ISO 9241-210. 2010. SFS-EN ISO 9241-210. Ergonomics of human-system interaction. Part 210: Human-centred design for interactive systems. Helsinki: Finnish Standards Association.
- Kraft, C. 2012. User Experience Innovation: [user Centered Design That Works]. Apress L.P.
- Kuniavsky, M. 2003. Observing the User Experience: A practitioner's guide to user research. San Francisco: Morgan Kaufmann Publishers.
- Laine, M., Bamberg, J., Jokinen, P. 2007. Tapaustutkimuksen taito. Helsinki: Gaudeamus Helsinki University Press.
- Leung, L. 2008. Digital Experience Design: Ideas, Industries, Interaction. Bristol: Intellect Books Ltd.
- Levy, J. 2015. UX Strategy: How To Device Innovative Digital Products That People Want. O'Reilly Media
- Lowdermilk, T. 2013. User-centered design. Sebastopol: O'Reilly Media.
- MacKenzie, S. 2013. Human-Computer Interaction: An Empirical Research Perspective. Waltham: Morgan Kaufmann.
- McElroy, K. 2017. Prototyping for Designers: Developing the Best Digital and Physical Products. Sebastopol: O'Reilly Media.
- Newbery, P., Farnham, K. 2013. Experience Design: A Framework for Integrating Brand, Experience, and Value. New Jersey: John Wiley & Sons, Inc.
- Nielsen, J. 1993. Usability Engineering. San Diego: Morgan Kaufmann.
- Norman, D. 2013. Design of everyday things. New York: Basic Books.
- Ovaska, S., Aula A. & Majaranta, P. 2005. Käytettävyystutkimuksen menetelmät. Tampere: Tampereen Yliopisto Tietojenkäsittelytieteiden laitos.
- Reiss, E. 2012. Usable usability: Simple Steps for Making Stuff Better. Indianapolis: John Wiley & Sons, Inc.
- Rosenfeld, L., Morville, P., Arango, J. 2015. Information Architecture: For the Web and Beyond. Sebastopol: O'Reilly Media, Inc.

- Roto, V., Law., E., Vermeeren, A. & Hoonhout, J. 2011. User Experience White Paper. Bringing clarity to the concept of User Experience.
- Rubin, J. & Chisnell, D. 2008. Handbook of Usability Testing: How to Plan, Design and Conduct Effective tests. Indianapolis: Wiley Publishing, Inc.
- Russell-Rose, T. & Tate, T. 2013. Designing the search experience: The information architecture of discovery. Waltham: Morgan Kaufmann.
- Saffer, D. 2010. Designing for interaction: creating innovative applications and devices. Berkeley: New Riders.
- Saaranen-Kauppinen, A., Puusniekka A., Kuula, A., Rissanen, R. & Karvinen, I. 2009. Menetelmäopetuksen tietovaranto KvaliMOTV: Kvalitatiivisten menetelmien verkko-oppikirja. Tampere: Yhteiskuntatieteellinen tietoarkisto, Tampereen Yliopisto.
- Sauro, J. & Lewis, J. 2012. Quantifying the User Experience: Practical Statistics for User Research. Waltham: Morgan Kaufmann.
- Schneider, J., Stickdorn, M. 2010. This is service design thinking: basics-tools-cases. Amsterdam: BIS Publishers.
- Shneiderman, B. & Plaisant, C. 2010. Designing the user interface: strategies for effective human-computer interaction. Boston: Addison Wesley.
- Silver, M. 2005. Exploring the Interface Design. London: Delmar Learning.
- Smashing Media GmbH. 2012. User Experience Design. Freiburg.
- Spiliotopoulos, T., Papadopoulou, P., Martakos, D. & Kouroupetrolou, G. 2010. Integrating Usability Engineering for Designing the Web Experience: Methodologies and Principles. Hershey: Information Science Reference.
- Stickdorn, M., Hormess, M. E., Lawrence, A., Schneider, J. 2018. This is service design doing: Applying Service Design Thinking in the Real World. Sebastopol: O'Reilly Media.
- Still, B. & Crane, K. 2017. Fundamentals of User-Centred Design: A Practical Approach. Boca Raton: Taylor & Francis Group, LLC.
- Swallow, D., Blythe, M. & Wright, P., 2005. Grounding experience: relating theory and method to evaluate the User Experience of smartphones.

Swanborn, P. G. 2010. Case Study Research: What, Why and How? London: SAGE Publications Ltd.

Szabo, P.W, 2017. User Experience Mapping. Birmingham: Packt Publishing Ltd.

Tullis, T. & Albert, B. 2013. Measuring the User Experience: Collecting, Analyzing, and Presenting Usability Metrics. Waltham: Elsevier.

Yin, R.K. 2009. Case Study Research: Design and Methods. Thousand Oaks: SAGE Publications Inc.

Yin, R.K. 2011. Qualitative Research from Start to Finish. New York: The Guildford Press.

Electronic sources

Boag, P. 2015. Adapting empathy maps for UX design. Sited 7.6.2018. <https://boag-world.com/usability/adapting-empathy-maps-for-ux-design/>.

Cao, J. The Practical Guide to Empathy Maps: 10- Minute User Personas. Sited 7.6.2018. <https://www.uxpin.com/studio/blog/the-practical-guide-to-empathy-maps-creating-a-10-minute-persona/>.

Directive 2016/2102/EU. The European Parliament and Council directive on the accessibility of the websites and mobile applications of public sector bodies. Official Journal of the European Union 2.12.2016. Sited 14.5.2019. <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32016L2102>

Hewett, Baecker, Card, Carey, Gasen, Mantei, Perlman, Strong & Verplank. 2009. ACM SIGCHI Curricula for Human-Computer Interaction. Sited 16.2.2019. <http://old.sigchi.org/cdg/cdg2.html>.

Hassenzahl, M., Tractinsky N. 2006. User Experience- a research agenda, Behaviour & Information Technology, 25:2, 91-97. <http://www.uio.no/studier/emner/matnat/ifi/INF5590/h12/undervisningsmateriale/hassenzahl---tractinsky-2006-user-experience-research-agenda.pdf>

Nielsen Norman Group. 2014. Turn User Goals into Task Scenarios for Usability Testing. Sited 30.6.2018. <https://www.nngroup.com/articles/task-scenarios-usability-testing/>

Siang, T. 2019. What is interaction design? Sited 21.4.2019. <https://www.interaction-design.org/literature/article/what-is-interaction-design>

Silver, K. 2007. What puts the design in interaction design. Sited 2.2.2019. <https://www.ux-matters.com/mt/archives/2007/07/what-puts-the-design-in-interaction-design.php>

Unpublished sources

Company X. Customer support self-help portal feedback data from 01.02.2018-13.3.2018.

Company X. Target consumer descriptions.

Company X. Support Section statistics 02.03.2018.

Figures

Figure 1 Human-centred design activities (ISO 9241-210)	12
Figure 2 Iterative UX process (Chesnut & Nichols 2014, 237)	15
Figure 3 Perceived value (Newbery & Farnham 2013, 75)	18
Figure 4 Search User Experience (Russell-Rose & Tate 2012, 1-2)	20
Figure 5 Ease of use (Reiss 2012, 29).....	24
Figure 6 Elegance and clarity (Reiss 2012, 137)	26
Figure 7 Doing case study research: a linear but iterative process (Yin 2009, 2)	31
Figure 8 Development methods for User Experience (Tiira 2018).....	34
Figure 9 Empathy map for User Experience (Boag 2015)	36
Figure 10 Usability testing tasks (Goodman et al. 2012, 286-287)	39
Figure 11 Five phases of analysis and their interactions (Yin 2011, 178)	42
Figure 12 Self-help portal opportunity (Tiira 2018).....	45
Figure 13 Persona 1: Goal Oriented Expert (Tiira 2018)	46
Figure 14 Empathy map for Persona 1	47
Figure 15 Persona 2: Non-technical athlete (Tiira 2018)	48
Figure 16 Empathy map for Persona 2	48
Figure 17 Persona 3 Loyal member of the community (Tiira 2018)	49
Figure 18 Empathy map for Persona 3	50
Figure 19 Self-help portal user journey map (Tiira 2018)	55
 Tables	
Table 1 Usability test for time to complete.....	51
Table 2 Usability test for errors	52
Table 3 Results of usability test tasks (Tiira 2018)	53