Defining New Directions for

User Experince Design

Master of Arts Thesis
Riku Hänninen
2015

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Master of Arts thesis abstract

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Abstract

This thesis researches the history, current status and the probable future development of user experience design. The aim of the thesis is to gather insights on where the field of user experience design is evolving as the world is entering a transformational experience economy. These insights form the basis for the following thesis project.

The research phase consists of a literature review and interviews of the customers of Cybercom Finland - the client company of the thesis project. Some of the research topics are also analyzed through the author's own experiences as a designer in the field.

The historical development in the literature research chapter dates back to the emergence of ergonomics and software development moving step by step towards the current practice. The historical research concentrates specifically on how 'human factors' have evolved from ergonomics to user experience. It also studies related themes such as lean user experience, service design, the internet of things and the concept of value creation. The literature review builds a holistic picture of the current digital design scene and the surrounding environment.

Cybercom Finland has clients in several industries and all the clients that were chosen for the interviews operate in different industries. The customer interviews list issues that they face in developing their digital services and map out new opportunities and needs for user experience design. These insights are the basis for the thesis project. The interviews were conducted using the Value Proposition Canvas – created by Osterwalder, Pigneur and Papadakos - as the basis. The interviews aimed to fill out customer profiles. The tool was chosen in order to get actionable insights on how design and IT consultancies can create value to their customers.

Operating in a rapidly changing environment poses challenges to the IT sector, but being able to project what are the greatest trends in the future of the field will help out in planning the ways of working as well as specific skillsets required. The objective of the thesis project is to create new initiatives for user experience design incorporating an International Design Business Management approach. The project combines the findings from the research phase and merges those insights with the potentials and constraints of consultancy business and the client company's strategy. Finally the thesis presents possible next steps for the outcome and reflection on the process itself.

Keywords user experience design, service design, internet of things, value creation

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Tämä opinnäyte tarkastelee käyttäjäkokemussuunnittelun (UX design) historiaa, nykytilaa sekä tulevaisuutta. Työn tarkoituksena on kerätä taustatietoa, jonka avulla on mahdollista arvioida kuinka käyttäjäkokemussuunnittelu kehittyy, kun maailma suuntaa niin sanottuun muutoslähtöiseen kokemustalouteen. Kerätty tieto toimii pohjana tutkimusta seuraavalle opinnäytetyöprojektille.

Tutkimusosio koostuu kirjallisuuskatsauksesta sekä asiakasyrityksen (Cybercom Finland) asiakkaiden haastatteluista. Osaa tutkimusaiheita analysoidaan myös kirjoittajan oman suunnittelutyökokemuksen pohjalta.

Kirjallisuuskatsauksen historiaosiossa tutkitaan käyttäjäkokemussuunnittelun kehitystä askel askeleelta alkaen ergonomiasta ja ohjelmistokehityksestä. Historia keskittyy erityisesti siihen kuinka inhimilliset tekijät (human factors) ovat kehittyneet käyttäjäkokemussuunnitteluksi. Kirjallisuuskappale tutkii myös aiheeseen liittyviä teemoja kuten ketterää käyttäjäkokemusta (lean UX), palvelumuotoilua, asioiden internetiä (IoT, internet of things) sekä arvon luomista (value creation). Kirjallisuuskatsaus rakentaa kokonaiskuvan digitaalisen suunnittelun nykytilasta ja toimintaympäristöstä.

Cybercom Finlandilla on asiakkaita useilla toimialoilla ja haastetteluihin valitut asiakkaat toimivat kaikki eri alalla. Asiakashaastatteluiden materiaalin pohjalta on listattu haasteita, joita asiakkaan kohtaavat digitaalisia palveluita kehittäessä. Näiden ongelmien pohjalta on kartoitettu mahdollisuuksia ja tarpeita käyttäjäkokemussuunnittelulle. Haastattelut suoritettiin käyttäen Osterwalderin, Pigneurin ja Papadakoksen arvolupaustaulua (Value Proposition Canvas), jonka ensimmäisessä vaiheessa täytetään asiakasprofiilit. Työkalun valintaperusteena oli se, että menetelmä mahdollistaa käytännönläheisen tiedon keräämisen. Tietoa kerättiin erityisesti silmällä pitäen arvoa, jonka IT-konsultti voi tuottaa kyseen omaisille yrityksille.

Toimiminen nopeasti muuttuvassa ympäristössä on IT-alan toimijoiden suurimpia haasteita, mutta tulevaisuuden suurimpien trendien ennustaminen tuo varmuutta ja auttaa kehittämään työtapoja sekä oikeanlaista osaamista. Opinnäytetyöprojektin tavoitteena on kehittää asiakasyritykselle uusia käyttäjäkokemussuunniteluun liittyviä aloitteita International Design Business Management – lähestymistavalla. Tehtävää suorittaessa oli sovitettava tutkimustulokset, konsulttityön realiteetit ja asiakasyrityksen strategia. Lopuksi opinnäyte esittelee mahdollisia seuraavia askeleita ja arvioi prosessia itsessään.

Avaisanat käyttäjäkokemussuunnittelu, palvelumuotoilu, asioiden internet, arvon luominen

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1. Introduction

The thesis topic was born out of my interests towards the field of user experience design and service design. I was motivated to learn more about the history and how the field had evolved over the years. My industry project teamwork in the Aalto International Design Business Management major program concentrated on service design, but afterwards I still felt the need to know more. Having had meetings with my thesis supervisor brought me to the conclusion that I needed to know more about the evolution of the digital design field.

My design brief from the client company was to make new initiatives for design within the company. Framing the project was then up to my consideration, although decisions were approved by the principal service designer of the client company. Service design was also brought up by the client as one possible theme for the design initiatives.

I have worked for the client company - Cybercom Finland - for more than two years and that means that I understand the space where the company operates and, to some extent, how things are done within the company. I have always been interested in taking the next step and applying new methods of working, so naturally this would be one primary element of my thesis.

1.1 Research background

Technology is changing rapidly and that changes the terrain in which user experience designers are operating. The field has evolved quite a bit over the years, but what is going to happen next and how will user experience adapt to that change? Mobile devices, such as smart phones, have been around for decades now. They gather data and are connected over the internet. However, there are more and more connected devices now that gather data. Even regular household appliances are getting connected. The sensors in these devices can pick up for instance humidity, temperature or location data to name a few.

New forecasts regarding the opportunities of IoT include GE estimating that the “Industrial Internet” has the potential to increase the global GDP by $10 to $15 trillion over the next 20 years, and Cisco estimateing an increase of $19 trillion in its forecast for the economic value created by the “Internet of Everything” in the year 2020 (Press, 2014). As for the estimate on the number of wireless connected devices in the future: ABI Research (a technology market intelligence company) estimates that there will be 40.9 billion connected devices in 2020 whereas the forecast for

2014 was 16 billion (ABI Research, 2014). From the professional prognosticator point-of-view: Gartner estimates that IoT product and service suppliers will generate incremental revenue exceeding $300 billion in 2020 (Rivera and van der Meulen, 2014).

This obviously is a great opportunity for design. The connected devices enable added value to customers and possible new business models for companies that can harness them.

Connected devices do not meet business needs on their own. They are in many cases accompanied by services. Services accounted for a staggering 70 per cent of the Finnish GDP in 2014, and their share is growing (Tilastokeskus, 2015). This obviously is another great opportunity for design.

1.2 Client company

Cybercom Group

Cybercom is as Swedish IT consulting company founded in 1995 and it has 1300 employees. The company has 20 years of experience in IT and communications technology. The company and its consultants help businesses and organisations benefit from the opportunities of the digitally connected world. The company web site elaborates that: "Cybercom's offering is organised into four key areas: Connected Industry, Connected Consumer, Connected City and Connected Citizen". Some of the group's largest clients are Alma Media Group, Cable & Wireless Communications, Ericsson, Finnish National Board of Education, Millicom, MTV, Swedish National Police Board, Saab, Swedish Tax Agency, Sony Mobile, Stockholm County Council, and Volvo. Although the company has operations all over the world, the strategic focus is on the Nordic region. Other parts of the strategy are it's uniform client offering, three strong, interconnected business domains (Connectivity Solutions, Connectivity Management and Secure Connectivity) and broadening the client base (Cybercom, 2015).

Cybercom Finland

Cybercom Finland is a part of Cybercom Group. It has 260 employees and its services are consulting, digital service development, cloud services and DevOps (development and operations). The company has offices in Helsinki, Tampere and Turku. (Cybercom, 2015)

1.3 The thesis project

The goal of the project is to create new initiatives for the Cybercom design studio to pursue. The initiatives can be new

services, addition to existing services, new ways of working or perhaps a combination of these. The initiatives need to be based on solid research and knowledge.

Cybercom has a strong user experience team with dozens of years of experience in designing, testing and evaluating user experiences. The current service design approach is believed to add value to Cybercom's services by taking into account all stakeholders and their needs. This belief is not uncommon amongst the players in the Finnish IT sector, and the main issues in integrating service design is definitely its communication to clients and connection to other services.

The outcome of the thesis project will address the question why, but will not answer how. The outcome will be immaterial and something that can and will be developed further after the thesis project is completed.

Issues

Why fix something that is not broken? The underlying reason for this thesis project is that there are some frequently mentioned issues with design at Cybercom Finland.

Cybercom design has the right kind of elements and the right focus, but the continuity of user experience design in some projects could be improved. In some cases the early design stage is all that the customer is willing to buy, but that does not guarantee a successful project. That basically means that sales need to aim to sell a longer-term design project. The design studio needs to learn and develop good practices based on the many successful longer-term projects. What needs to be solved then is: how to manage and sustain that continuity?

The design needs to be constantly overseen by a user experience designer in order to achieve the best outcome. Objectives of the project can change over time and design has to react to that. Another issue is that developers are in many cases not qualified to create visual designs and that clearly shows in the outcome. Designs need to be accurate and accurately followed by the development team. This is a common issue in the industry, but nonetheless needs to be resolved. The company clearly needs cross-functionality in some form. This is an issue in the ways of working.

Another issue that our Finnish Design Studio has recognized is the scarcity of design interaction between the countries within Cybercom Group. Being an international design business management student, I see that this

could be a great and currently un-exploited opportunity for the entire Cybercom Group.

An issue that is certainly less obvious, is the future. This is my main interest and focus in the thesis. Does Cybercom Finland Design Studio come prepared for the future? What type of knowledge and skills are appreciated in the future design projects? The big question is: where is the industry or actually the whole world headed and is Cybercom headed in the same direction? The employees' knowledge and skills as well as ways of working need to remain relevant.

The final outcome of the thesis will be designed to achieve improvements in the above mentioned issues in varying degrees.

1.4 Definition of key concepts

The key concepts will be further elaborated in the literature review, but this chapter summarizes the key concepts of the thesis very briefly.

Client / Client company
These terms refer to the client of the thesis project: Cybercom Finland.

Customer
In this thesis the customer refers to a customer of the client company Cybercom Finland.

User experience design (UX design)
The term covers all aspects of the person's experience with the system including industrial design, graphics, the user interface, the physical interaction, and the instruction (Merholz, 2007)

Service design
A field that aims to make the delivered service useful, usable, efficient, effective and desirable (UK Design Council, 2010).

IoT
The term internet of things (formerly referred to as ubiquitous computing) covers many types of objects that are connected over the internet such as mobile phones or sports bracelets (McEwen and Cassimally, 2013, pp. 9-11).

Connectivity
"The ability to connect to or communicate with another computer or computer system" (Merriam-Webster, 2015).

Value creation
In terms of creativity, the term refers to innovative ways to use materials, technologies and processes (Hughes, 2013).

1.5 Thesis framing and structure

Literature review

The main design concepts are explained thoroughly in order to illustrate the full context to the reader. The background research investigates the whole history of the human perspective in designing digital services starting from dated concepts such as Human-Computer-Interaction (HCI). The aim of this chapter is to understand the changes that have taken place in order to understand possible future changes. This section will introduce some of the complex and somewhat confusing terminology that the field utilizes.

Customer interviews

The customer interviews aim to define what (kind of design consultancy) do companies from various sectors need using an empirical research approach. These learnings with the literature review will provide sufficient insight in completing the project.

Conclusions of the learnings

The final chapter presents conclusions from the combination of the literature review and the interviews. The conclusions will be matched with the knowledge of the client company and its strategy.

2. Research methodology and questions

This chapter presents the research methodologies that were chosen as well as the research questions for the thesis.

2.1 Methodological choices

The following research methods were chosen on the basis of the characteristics of the project. The project required qualitative data to form a basis for ideating new initiatives. There needed to be room to be creative and interpret the underlying reasons as well as the ability to combine all the findings in a flexible manner.

Literature review

The literature review concentrates on the essential literature and publishings regarding the research questions. According to Hirsjärvi (2004) the aim of the literature review is to illustrate how the topic has been previously studied and how the topics relate to the research questions. The literature review needs to present the main viewpoints on the topic and the leading researchers in the field. The literature review has to also show the possible conflicts between various viewpoints. A synthesis will be made of the most relevant studies. The author must be conscious and aware that the objective and take no side in presenting the viewpoints in the literature review, but from that basis the writer will later on argue and discuss with the literature (Hirsjärvi et al., 2004, pp. 111 – 113).

Interview

The main upside to interviews as a study method is that the data collection can be controlled during the process. It also leaves more room for interpreting the results. The reasons behind choosing interviews as the main study method vary. The interviewee must be able to express their views as much as possible. Interviews are also used for studying uncharted new areas, since the interviewer cannot predict the outcomes. The only thing that can be predicted is that the variation of the data will be great. Sometimes the researcher might want to see the whole context around the interviewees speech, such as expressions. Interviews enable elaborating and deepening answers during the data collection process. The downsides to interviews are obvious: the interviewee may try to present himself of herself e.g. as a good citizen. In a sense the interviewee might play a role. The role also prevents them to talk about financial issues, illnesses etc. (Hirsjärvi et al., 2004, pp. 193 – 196).

Specifically the main research method of this thesis is the theme-based interview. Hirsjärvi's (2004) description of this method is that the detailed form of the questions or the order is not predetermined. However the themes of the interviews are determined beforehand (Hirsjärvi et al., 2004, pp. 197 - 196).

Transcription and analysis

Gillham describes transcribing as the process of producing a valid written record of the interview and after which the data is analyzed. Analysis is a selective and interpretative process. In these processes of course the speaker's emphasis, tone and pace are lost (Gillham, 2005, p.121). The transcription process makes the transcriber almost automatically start to 'construct' the analysis. "An unstructured interview is usually conducted with narrative or thematic forms of analysis in mind" (Gillham, 2005, p.126).

Research gap

There is a scarcity of historical reviews on the user interface design field. However there is much literature on futures and futures research. Technology publications predict the coming of connectivity and gesture user interfaces, but what is the connection between the past, present and future? They say history repeats itself, so where does the future take user interface design and how does that relate to the past? This thesis will look at the future of the IT industry and user experience design by reflecting on the past as well as investigating the present trends.

2.2 Research questions

The research aims to answer two questions:

What is the history behind user experience design and service design? Why has the field evolved in this way?

What kind of design expertise does the IT sector need in the future?

3. Literature review

The theoretical framework consists of a historical review of the user experience field as well as topics that are aligned with the strategy and objectives of the client company. Another theoretical area that is to be discovered in the thesis is value creation and value mapping. These are core topics for the thesis project in determining what kind of initiatives are suitable. The insights about value creation will be linked to the project through the customer interviews.

3.1 The History of User Experience Design

In order to project the future of user experience one needs to look back in time. What was before the now popular term user experience (UX) design and how have things changed since? The scope of the research spans from the emergence of human-computer interaction field to service design and to the internet of things. The research discovers the viewpoint of design and especially design consulting.

"Study the past if you would define the future."

— Confucius

The roots

Originally, ergonomics (ergon + nomos) otherwise known as "the study of work" was proposed by the Polish scientist W. Jastrzebowski in 1897 as the scientific discipline with a very broad scope of interests and applications: all aspects of human activity, including labor, entertainment, reasoning and dedication (Karwowski, 1991, pp. 671-686). Ritter, Baxter and Churchill (2014) pointed out that ergonomics draws on a numbers of research fields such as anatomy, engineering, physiology and psychology. The aim of the field is to maximize the healthiness and safety of work environments and work practices (Ritter, Baxter, and Churchill, 2014. p. 35). Classical ergonomics or interface ergonomics is a field which studied the person/machine interface that includes controls and displays. The designers main contribution to these systems is the design of the dials, displays, panels and such that make up the interface. This classical approach was first in use in the design of military equipment, but was later on applied to workplaces and items in civilian contexts. The approach usually takes a consultancy approach on matters and is delivered as principles, guidelines and standards (Ritter, Baxter, and Churchill, 2014, p. 37). There is also a related field called error ergonomics which produces data banks of error probabilities

for a variety of tasks performed under a variety of circumstances (Ritter, Baxter, and Churchill, 2014, p. 38).

The systemic age

The 1950s ushered in an era of systems ergonomics. According to Ritter, Baxter, and Churchill (2014) the approach is a more holistic one: the user and the system are seen as one single interacting system that operates within a work context. In this approach the ergonomist is part of the the design team and works throughout the system design phase. The field differs from user-centered design since the user is treated as a part of the system, whereas user-centered design would define the users needs and perspective than those of the system (Ritter, Baxter, and Churchill, 2014, p. 39).

The text age

Ritter, Baxter, and Churchill (2014) describe the 60s and the 70s as the era when the world saw a rapid increase in the use of computer-based technologies which employed text-based user interfaces. The role of the machine operator changed from being directly in control of the machinery to interacting with computer-based technology. This changed the role from doing to thinking and thus it became necessary to to understand how people made decisions, took actions and perceived problems. These changes led to the development of the field of cognitive ergonomics (Ritter, Baxter, and Churchill, 2014, p. 39).

On the other hand Mayhew (2008) claims that during the 60s and the 70s there was still little or no specialization in the software development industry. Programmers took care of the business and functional analysis, they did project management, they did system architecture, they did user interface design, they coded, and they did software testing and quality control and user support (Mayhew, 2008, p. 99).

According to Ritter, Baxter, and Churchill (2014) the late 70s and early 80s introduced the field of cognitive systems engineering (CSE). The field is concerned with human-machine systems. CSE is also concerned with applicable, approximate models of how people perceive, process, attend to and use information to achieve their goals. The field focuses on the results of theories which can predict actions and behavior in real world settings (Ritter, Baxter, and Churchill, 2014, p. 40).

The desktop age

Carroll (2014) explains that graphical interfaces were introduced in the 80s by Apple Macintosh and the so-called

messy desktop. It was a stark contrast to Unix, in which all interactions were triggered by typing commands (Carroll, 2014).

Mayhew (2008) suggests that during the 80s the software industry began to specialize. There was a growing need for interface coders (front-end) and the system architecture coders (back-end). The software engineers were now accompanied by business and management people such as business analysts and account managers (Mayhew, 2008, p. 100). During the emergence of personal computing a field emerged that was called human-computer interaction (HCI). The term refers not only to interaction between humans and workstations - computers may be in the form of embedded computational machines, such as parts of spacecraft cockpits or microwave ovens (Hewett et al., 2009). Until that time the only humans who interacted with computers were either information technology professionals or dedicated hobbyists (Carroll, 2014). The HCI specialists were also called user interface designers or "human factors" and they were not welcomed by the developers nor were they fully understood by the management (Mayhew, 2008, p. 100). Human factors however is not synonymous to HCI, since its roots were in developing empirical and task-analytic techniques for evaluating human-system interactions in domains such as aviation and manufacturing The main concept of HCI is usability and it was originally articulated somewhat naively in the slogan "easy to learn, easy to use" (Carroll, 2014).

As explained by Ritter, Baxter, and Churchill (2014), the 80s also introduced user-centered design (UCD) and human-centered design (HCD). UCD involves focusing on the user's needs by making activity and task analyses, early testing, evaluation and iterative design. The focus is broad, but differs from the systems approach since the methods for gathering requirements and specifications is less rigid and more of a flexible iterative design methodology (Ritter, Baxter, and Churchill, 2014, p. 43). HCD on the other hand considers the humans the most important element of the information system and thus must be designed in. Both of the aforementioned approaches tend to emphasize the user participation in the design process and ideation and evaluation of design decisions (Ritter, Baxter, and Churchill, 2014, p. 44).

The web age

Ritter, Baxter, and Churchill (2014) pointed out that, the beginning of the decade the HCI specialists were in fact

generalists - in their own area. There were no specialized roles, no structures and no standards. But in the mid to late 90s at the time of the dot com boom, things were changing: there were interface designers, requirements analysts, usability testers and also graphic designers (Mayhew, 2008, pp. 100-101).

Carroll (2014) argues that the mid-1990s HCI professionals and everybody else realized that the desktop metaphor proved to be more limited than it first seemed. The desktop can become cluttered with a mass of personal files and folders. This paved the road for search, which is a more fundamental paradigm and was suitable for the World Wide Web. However the search did not fully replace the desktop, but the desktop is no longer a hegemonic design concept (Carroll, 2014).

The mobile age

According to Merholz (2007) Don Norman coined the term user experience while being the Vice President of the Advanced Technology Group at Apple. In his own words: "I invented the term because I thought human interface and usability were too narrow. I wanted to cover all aspects of the person's experience with the system including industrial design, graphics, the interface, the physical interaction, and the manual. Since then the term has spread widely, so much so that it is starting to lose it's meaning… user experience, human centered design, usability; all those things, even affordances. They just sort of entered the vocabulary and no longer have any special meaning. People use them often without having any idea why, what the word means, its origin, history, or what it's about" (Merholz, 2007).

Gibbons (2013) states that emergence of the world wide web formed user experience design. The field had to respond to the changes in the marketplace and changes in the understanding of users. UX became a more defined, deeper understanding of the requirement of a more heterogeneous user population, including an interest in accessibility and cross-culturality (Gibbons, 2013).

3.2 The current trends

User experience design

Usability guru Jacob Nielsen's Nielsen Norman Group website describes user experience as something that meets the exact need of the customer, without fuss or bother. It is also described to possess simplicity, elegance and joy. In order to create a great user experience

there needs to be cooperation of multiple disciplines including engineering, marketing, graphical and industrial design, and interface design. True user experience is deeper than giving users what they want. The NNg website also notes that user experience (UX) is to be distinguished from user interface (UI). User experience involves also the content of the service whereas UI is mostly concerned on how the content is presented. UX is also compared to usability (qualities of the UI) as being a much broader concept (Nielsen and Norman, 2015).

In the beginning of the new millennium Jesse James Garrett, who now titles himself an experience designer, wrote a book called The Elements of User Experience in which he also published his famous diagram of user experience.

Garrett (2011) proposed that experience is built from the bottom to the top: strategy, scope, structure, skeleton, and surface (see Figure 1). Working up the planes, the issues that we deal with become more concrete. The lowest plane is concerned with how the product or service fulfils our strategy while meeting users' needs. However, on the highest plane, our main concern are the most concrete details of the product of service. The choices that are made on the lower plane must be aligned with higher plane and so on. Otherwise the

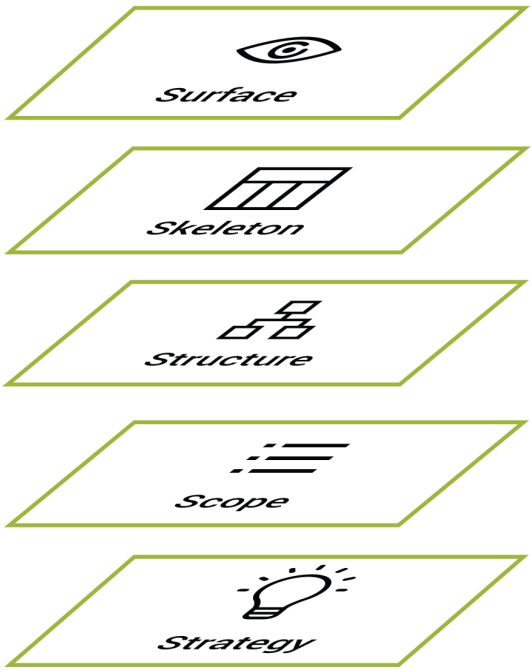

Figure 1. The elements of user experience (Garrett, 2011, p. 22)

team faces the impossible task of fitting together components that do not naturally fit (Garrett, 2011, pp. 21-22).

On the other hand Garrett (2011) hypothesized that the web has a dual nature (see Figure 2). The software interface side is concerned about how the user interacts with the system and what the functionalities are. And the underlying 'web as a hypertext system' is concerned about the information architecture and the content required in the site in order to meet user needs. Both sides of course initially derive their objectives from user needs (Garrett, 2011, p.25).

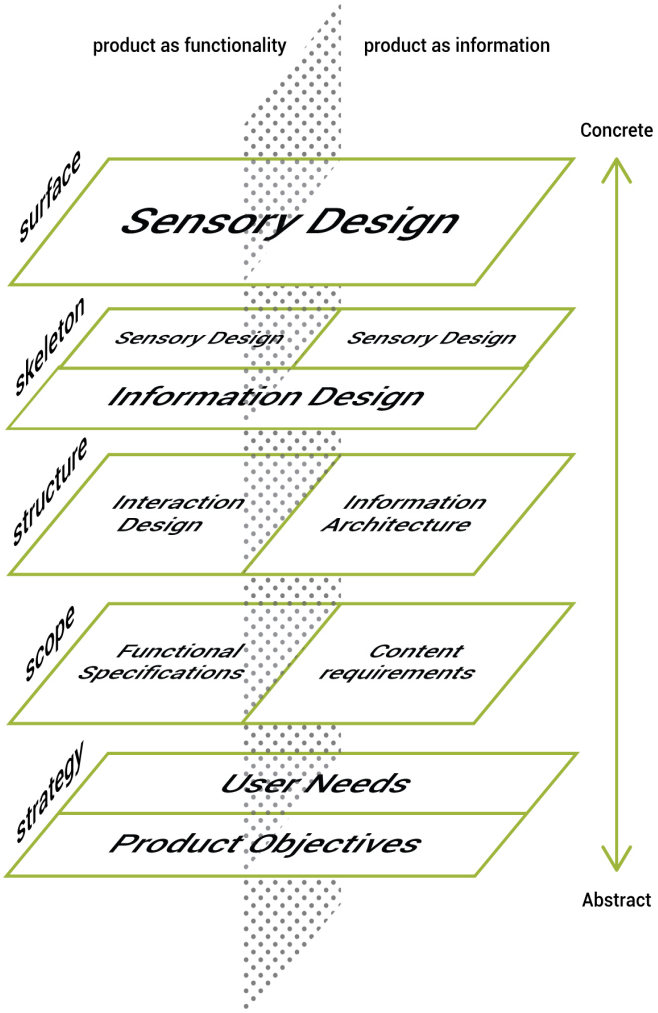

Figure 2. The elements of user experience (Garrett, 2011, p. 27)

Gibbons (2013) stated that user experience designers are in such a role in which they have the ability to tap into the unmet and undefined needs of the users. That position makes UX designers able to identify opportunities for better design and new business. (Gibbons, 2013) Since user experience is so concerned with the user, it also needs to be concerned with the right user segment. Who are the assumed user of the service and why? What do the want to accomplish with the service (Moule, 2012, p.25)?

As for UX design in practice: Garrett (2011) highlighted that product and service development is rarely a sprint (running as fast as you can from beginning to end), but a marathon. There will be times, when you push forward: create ideas and build prototypes, and there will be times when you fall back and see how the pieces fit together in the big picture. Good marathon runners know when to speed up and when to slow down (Garrett, 2011, p. 160). The

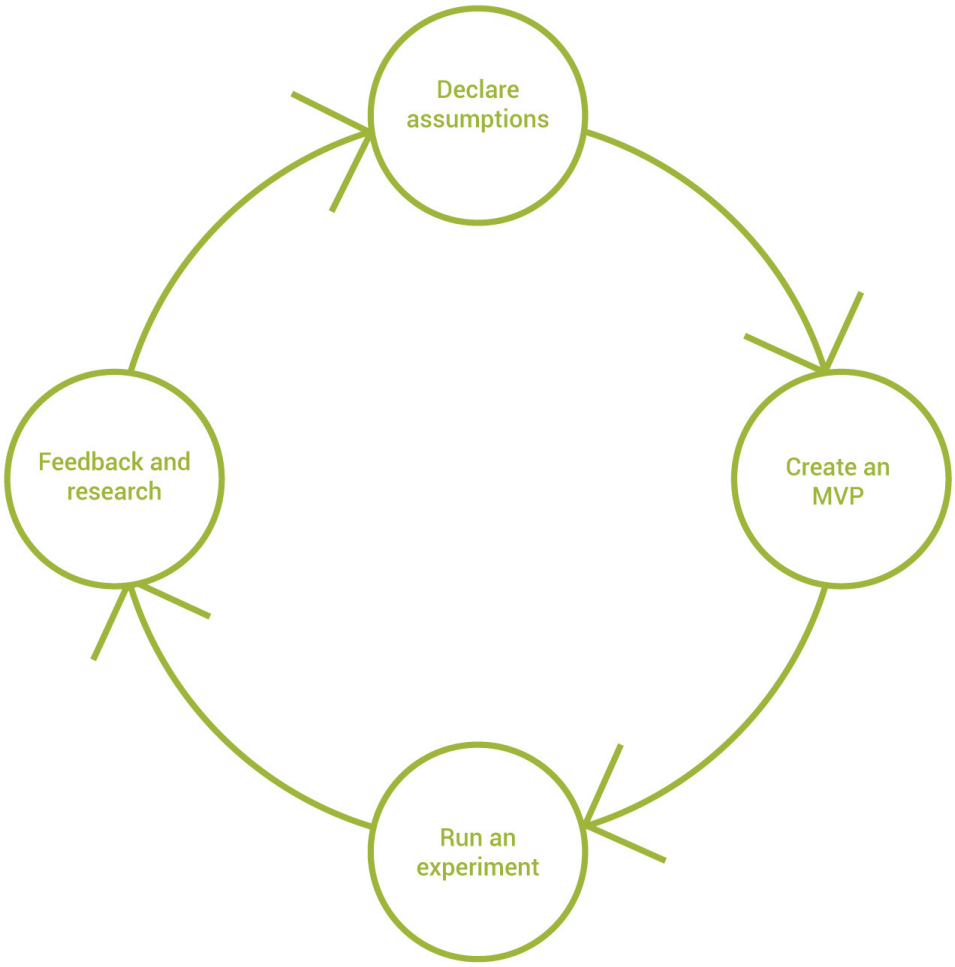

Figure 3. The Lean UX process (Gothelf, 2013, p. 18)

next chapter will present a way to run the marathon.

Lean UX

Lean user experience is a management approach that has three foundations. Design thinking lends the idea of approaching every aspect of business with design methods and encourages non-designers to use design methods as well as encourages teams to consider to collaborate across roles and consider product design from a holistic perspective. Agile software development lends its way of delivering customer value in a continuous manner (see Figure 3). And finally the third foundation is The Lean Startup method founded by Eric Ries which lends the idea of the MVP (minimum viable product) and the feedback loop called "build-measure-learn" (Gothelf, 2013, pp. 6-7).

The Lean UX approach consist of various methods. Teams should be cross-

functional and their involvement must be continuous from start to finish. The teams should also be small, dedicated to one project and co-located. The approach promotes outcomes over output and documents, which means moving towards an outcome rather than for example a fixed set of product features. This leads to problem-focused teams, that have an actual (business) problem to solve. The approach lends the idea of removing waste introduced by lean manufacturing: anything that does not contribute to the outcome is considered waste. Another lean manufacturing principle is that the batch size should be small - creating only the necessary designs. The continuous discovery principle simply means engaging the customer on a regular basis. The G.O.O.B. principle means that the team must get out of the building to the marketplace to find answers and test ideas. The team also has to gain shared understanding of the space, product and customers. The approach is firmly against rockstars, gurus and ninjas that break down team cohesion. Lean UX also promotes externalizing one's work by getting out of the building. One key principle is: 'making over analysis', which means creating over debating about the merits of a concept. Lean UX favors learning over growth which means that the idea has to be proven right before scaling it to the whole customer base. Failure is inevitable and the team has to be safe to fail in order to succeed. Success comes from an environment where experimentation is allowed (Gothelf, 2013, pp. 7-12).

Moule (2013) argues that the typical iterative concept design cycles operate in the same way as agile sprints. However the whole experience should be conceptualized and validated before starting the first development sprint (Moule, 2013, p. 220). On the other hand Jeff Gothelf's (2013) Lean UX book suggests that in agency relationships it is imperative to seek to have software development start as early as possible - development partners must participate through the the whole life cycle of the project (Gothelf, 2013, p. 118).

Interaction design

The Interaction Design Association (IxDA) describes the concept as follows: "Interaction Design (IxD) defines the structure and behavior of interactive systems. Interaction Designers strive to create meaningful relationships between people and the products and services that they use, from computers to mobile devices to appliances and beyond" (IxDA, 2014).

The concept is very close to UX design, but interaction design takes place after

Service design - User-centered design in a new package?

On April 1 2015 I attended a seminar about service design at the Aalto university Chydenia building in Töölö. The seminar was a perfect fit for my thesis since it also claimed that service design is nothing entirely new, but a result of design evolving.

The most significant speaker was Antti Koskinen from Palmu. He started out by asking a question: is there something wrong with service design, since only a fraction of the designed services get published. But even though there is no visual outcome for service design that does not mean it has left no impact. In many cases the outcome is also development in the non-visible processes of the service. In this case the customers can be satisfied even though there is no visible outcome of the project.

He also spoke from experience that service design project can get de-railed when the person responsible for the project leaves the company - or when too many people leave their mark on a service.

Finally, Palmu does not design the touchpoints themselves. They outsource the design whether it is graphic or interior design.

UX design. As the previous history chapter explains, the field specializes more and more and task become detached (Axbom, 2011).

Service design

One can not write about user experience design without defining service design which is synonymous to UX design in many contexts.

Stickdorn and Schneider (2012) explain that due to it being a relatively new concept, service design does not have any comprehensive definition. There are not yet many study programs that teach service design (those that exist are young and still developing) and no textbooks for it exist (Stickdorn and Schneider, 2012, pp. 14-15).

Although the field as such is quite young, some of the tools used have been around for quite a time. For instance the service blueprint by Shostack (1984), which appeared in the january edition of the Harvard Business Review in 1984, has been around for some three decades. The tool is used for mapping out the user actions, physical and functional aspects of the service as well as processes and supportive processes that make the service work (Shostack, 1984, pp. 134-135).

What is service design:

"Service design is all about making the service you deliver useful, usable, efficient, effective and desirable"

(UK Design Council, 2010)

How service design is carried out:

"It is a new holistic, multi-disciplinary, integrative field"

(Moritz, 2005)

The most tangible and easy-to-understand definition can be found in a book called Service Design Thinking by Marc Stickdorn and Jakob Schneider (2012). The book describes service design as user-centered (services should be looked at through the experience of the customers), co-creative (all stakeholder should take part in the process), sequencing (the service should be broken down to a sequence of interrelated action and presented visually), evidencing (intangible services should be visualized through physical objects), holistic (the whole environment of a service should be considered) (Stickdorn and Schneider, 2012, p. 34).

Stickdorn and Schneider (2012) claim that service design is somewhat similar to marketing in a sense. Marketing is concerned with creating organisations, building relationships and co-creating value with customers whereas service design aims to co-design the whole service with the stakeholders (Stickdorn and Schneider, 2012, p. 50).

According to Miettinen (2011) service design is also playing a part in product design. Traditional product development companies are being challenged to create so called hybrid products. It means that the service is designed to be an inseparable part of the product. They combine a product concept and a service system (Miettinen, 2011, p.109).

Value Creation

Hughes (2013) proposes that in the past value creation was a function of industrial scale economies: mass production and the high efficiency of repeatable tasks. These days the value of products and services is based more on and more on creativity - the innovative ways to use materials, technologies and processes. Creativity means creating more value, typically by making the product or service better. This creativity or innovation needs to be managed by bringing individuals together in creative networks that conform to an ever changing landscape of customer needs and desires (Hughes, 2013).

The Value of Design from a Consultancy Perspective

Since the client for the project in this thesis company is essentially an IT and design consultancy, some elaboration is needed on what makes consultancy different. Design consultancies have quite a large number of clients and their brands.

Borja de Mozota (2001) argues that designers have a great diversity of viewpoints and insight on brand experiences. The danger in having regular clients is obvious: working on the same brand or brands can limit creativity (Borja de Mozota, 2001, p.174). Borja de Mozota points out that design firms differ in the way they master and develop specific tools and design methods that make the design process more tangible clients and that is what helps build trust between the design firm and the client (Borja de Mozota, 2001, p.176). The value of a design firm is also determined by many external factors such as: how often do the employees participate as speakers in symposia or conferences, publish articles in design journals and give interviews to the media, do they hold part-time professorships or give guest

lectures at universities, top businesses or design schools. and finally how well have they performed in design contests (Borja de Mozota, 2001, p.178).

Swann (2011) proposed that the value of design is becoming obvious. Companies such as Apple are raising the bar for user experience and other companies have to keep up with the change. We know quickly when a website is bad and that shapes our whole perception of the brand leaving a feeling of frustration or even disappointment. On the other hand when every touchpoint of a service is designed carefully, it leads to differentiation, customer loyalty and higher profits (Swann, 2011).

The transformational experience economy

Pine and Gilmore (2011) argue that commodities are fungible, goods are tangible and services are intangible, but companies need to stage experiences and connect with them in a personal, memorable way. Companies (or experience stagers) will not provide goods and services alone. They will

Economic offering	Commodities	Goods	Services	Experiences	Transformations
Economy	Agrarian	Industrial	Service	Experience	Transformation
Economic function	Extract	Make	Deliver	Stage	Guide
Nature of offering	Fungible	Tangible	Intangible	Memorable	Effectual
Key attribute	Natural	Standardized	Customized	Personal	Individual
Method of supply	Stored in bulk	Inventoried after production	Delivered on demand	Revealed over a duration	Sustained through time
Seller	Trader	Manufacturer	Provider	Stager	Elicitor
Buyer	Market	User	Client	Guest	Aspirant
Factors of demand	Characteristics	Features	Benefits	Sensations	Traits

Table 1. Economic distinctions (Pine and Gilmore, 2011, p. 253)

provide the resulting experience which is rich with sensations and personal. Just like in the theatre, the work of the experience stager perishes with its performance, but the value of the experience stays with the customer (Pine and Gilmore, 2011, pp 17-18).

Pine and Gilmore (2011) also explain why people are looking for these personal, memorable experiences (see Table 1). Eventually they want something beyond experiences: transformation. People don't buy memberships to fitness clubs to feel the pain, but to improve their physical well-being through ongoing exercise regimes. To avoid having their experiences commoditized companies need to design the experience in such a way as to create a desired change (Pine and Gilmore, 2011, pp 242-243).

Designing for IoT and connected devices

"IoT is still a technically driven field… the UX of many IoT products is some way off the level expected of mature consumer products"

(Rowland, 2015)

According to Malik (2014) user interfaces will become more invisible through gestures, voices, and even expressions as computing becomes even more immersed in our lives, embedded in our homes, and worn on our bodies (Malik, 2014).

Daugherty, Banerjee, and Alter (2014) claim that the line between physical products and digital services is getting more and more blurred. This also requires new business models since products are not only sold once, but they can be accompanied by services. These combinations are called product-service hybrids. IoT also enables adding product value in a new way. A simple product such as the light bulb can get additional value like the Philips Hue lightbulbs that can be adjusted from one's mobile phone (Daugherty, Banerjee and Alter, 2014).

As explained by Greenouch (2015) in many cases it is not just the products that count, but what the data enables. For instance some US health care insurers are handing out free fitness trackers to customers and offering lower premiums or other benefits for meeting daily exercise goals. IoT also already enables for instance usage based insurance (UBI) for cars (Greenouch, 2015).

Rowland (2015) points out that functionality can be distributed across

a variety of devices that have different capabilities that all serve as one service. The distributed user experience needs to be coherent across these devices (Rowland, 2015). Daugherty, Banerjee, and Alter (2014) poin out that, since products are running software they can also be upgraded. This possibility can be addressed at the design phase (Daugherty, Banerjee, and Alter, 2014).

Rowland (2015) also points out that IoT is largely asynchronous as some connected devices run on batteries and need to save power. Connection uses a lot of power, so they only connect intermittently. We are used to glitches on the internet, but it does not mix with the real world. "Imagine if you turned your lights on and they took two minutes to respond, or failed to come on at all" (Rowland, 2015).

Finally Rowland (2015) highlights that computing power and networking is embedded in more and more of the objects and environments around us, this requires a far greater emphasis on understanding the user's needs (Rowland, 2015).

Internet of Things (IoT)

McEwen and Cassimally (2013) explain that the term internet of things (formerly known as ubiquitous computing) covers many types of objects that are connected such as computerized timetables, sports bracelets that track your movements and of course mobile phones. The fact that connects all these example devices is that they could all be replaced by general-purpose computers, but these physical objects take on a more usable form (McEwen and Cassimally, 2013, pp. 9-11).

According to McEwen and Cassimally (2013) the technological advancements have enabled the internet of things: internet-capable computing does not cost thousands of pounds anymore, it cost tens of pence. Manufacturers of electronic devices have started to incorporate general-purpose computers into their products ranging from washing machines to to cars, as they have realized that this is cheaper. than creating custom chips. The wealth of programming and and debugging resources available to these platforms has made them easy to access for hobbyists and prototypers. Also internet connectivity has become cheaper and more convenient than before (McEwen and Cassimally, 2013, p. 14).

Mukhopadhyay (2014) suggests that the internet of things also faces some great challenges and one of the major ones is security. The internet and the wireless sensor networks can be used for illegal purposes such as extracting private

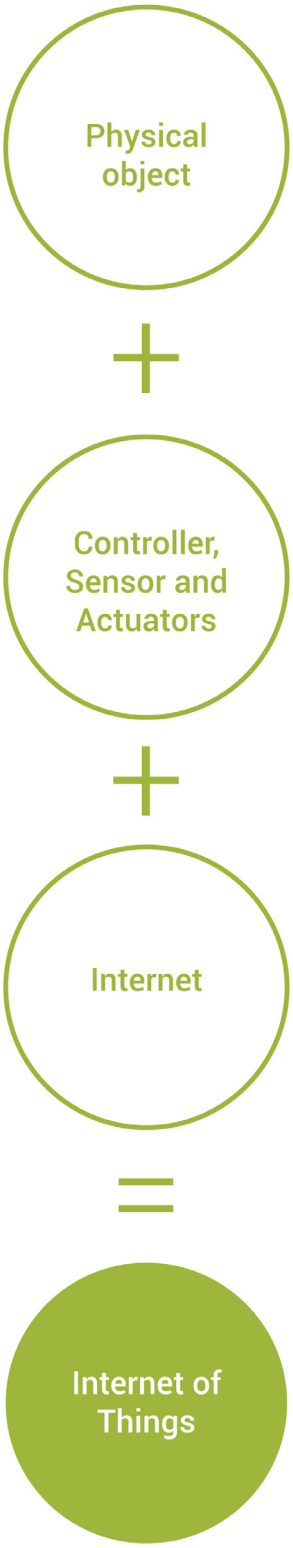

Figure 4. An Equation for the Internet of things (McEwen and Cassimally, 2013, pp. 11).

information. (Mukhopadhyay, 2014, pp.12-13).

As for how smart, connected products are transforming competition, Porter and Heppelmann (2014) call their emergence the third wave of IT-driven competition. The first wave was automating individual activities in the value chain, from order processing and bill paying to computer-aided design and manufacturing resource planning in the 1960s and 1970s and the second wave was the rise of the internet, which enabled coordination and integration across individual activities; with outside suppliers, channels, and customers; and across geography. The first two waves increased productivity gains and growth across the economy. It change the value chain, but the products remained for the most part unaffected. In this third wave smart, connected products offer rapidly expanding opportunities for new functionality, greater reliability, significantly higher product utilization, and capabilities that cut across traditional product boundaries. This third wave has the capability to be the biggest yet driver of economic growth and more innovation (Porter and Heppelmann, 2014).

"When wireless is perfectly applied the whole earth will be converted into a huge brain,

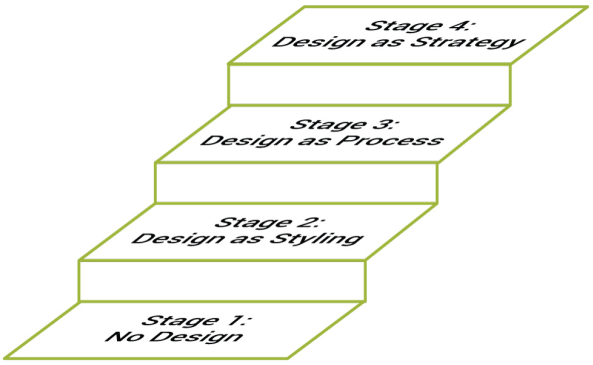

Figure 5. The Design Ladder: Four steps of design use (Walsh, 2011)

which in fact it is, all things being particles of a real and rhythmic whole."

- A quote from Nikola Tesla (Hunt and Draper, 2000, p. 177)

The design ladder

Walsh (2011) presents surveys done by the Danish Design Centre in 2003 and 2007. The surveys divide companies in four stages of design maturity: no design, design as styling, design as process and design as strategy (see Figure 5). In the 2003 survey the main finding was that the Danish companies that invested in design experienced an increase in their gross revenue that was 22 per cent higher than companies that did not purchase design. The 2007 survey revealed that, between 2003 and 2007, the number of Danish companies at stage three of design maturity rose from 35% to 45% and the number of companies at the highest stage rose from 15% to 20% (Walsh, 2011).

3.3 Literature conclusions

This chapter sums up the findings from the literature review. The literature review span from the emergence of ergonomics to the design, technology and business trends that now have an impact on UX design and will have in the future.

The User Experience Evolution Framework

In order to illustrate the evolution of UX design from several perspectives, I created the User Experience Evolution Framework (see Table 2) that synthesizes the literature review findings into a holistic view of the evolution of user experience design. The model also aims to project what user experience design will be in the near future.

The human factors have been around from the age of ergonomics and at the time the approach was applied to work environments and practices. System ergonomics on the other hand was applied to interaction with machines and their physical user interfaces. When computer-based technologies saw a

	Before the 1950s	1950s	1960s and 1979s	1980s	1990s	2000s	2010s	
Era	**The Roots**	**The Systemic Age**	**The Text Age**	**The Desktop Age**	**The Web Age**	**The Mobile Age**		**The Connected Age**
Field name	**Ergonomics**	**System ergonomics**	**Cognitive ergonomics**	**HCI**	**UX**	**Service design**	**Lean UX**	**Connected UX**
Technological environment	Work environments and practices	Interaction with machines	Textual user interface	Desktop devices	Desktop and mobile devices	Digital and physical services	Desktop and mobile devices	IoT, connected devices and big data
Goal	Healthiness and safety	Efficiency	Efficiency	Usability	Experience	Coherent experince	Evolving experience	Transformational, effectual and personal
User interface	None	Physical user interface	Digital (text based)	Digital (visual)	Digital (visual)	Coherent touchpoints	Digital (responsive)	Invisible and automatic
The role of design	None	Design as styling	Design as styling	Design as styling	Design as process	Design as process	Design as process	Design as strategy
Method of supply	Instructions	Instructions	Instructions	Visual designs	UI and visual designs	Customer journeys and service blueprints	Virtual prototypes	Physical & virtual prototypes
Scope	Specialized	Human and machine as one system	Decision-making, action-taking, problem perception	Specialized	Holistic	Holistic	Holistic	Holistic
Organization / team	None	Ergonomist as part of the design team	Undeliberately cross-functional	Siloed	Siloed	Cross-functional	Cross-functional	Cross-functional

Table 2. The user experience evolution framework

rapid increase, cognitive ergonomics was applied to the interaction between humans and computer-based systems. Since then the technology has evolved to desktop devices, mobile devices, coherent digital and physical services to IoT and connected devices. The history of user experience design tells a story of continuous specialization. In time HCI designers broke down to researchers, interface designers and so on Mayhew (2008). From that insight it could be argued that the specialization, to suit the needs of the changing world, will continue. In the very near future the industry will also be needing designers that understand the the opportunities in connected devices.

The model titles the future of design as Connected UX. As ABI Research (2014) suggests, technological environment will revolve around IoT, connected devices and big data. Based on the ideas of Pine and Gilmore (2011), the focus will be on designing transformational, effectual and personal experiences. User interfaces will be automated as far as the most trivial tasks go and invisible to the 'user' or controlled through gestures, voices, and even expressions.

As for the evolution of the goal of user experience design: it has evolved from the healthiness and safety of work environments in ergonomics to efficiency in the system ergonomics to the concept of usability in HCI towards a holistic view of experience and coherent service experience in UX, lean UX and service design. Eventually the goal will be more transformational and effectual, considering the underlying motives of users.

Design and software development have become easier tasks to perform with many specialized roles as Mayhew (2008) suggested, that leaves room for designers to paint the big picture instead of catering to the tiny components that make the service. Development is also becoming easier with ready-made platforms and resources as McEwen and Cassimally (2013) stated. The ready-made platforms are in many cases pre-designed and that means that the most trivial design tasks will see a decrease and design may become more strategic.

Taking into account the characteristics of IoT, lean user experience can provide some good advice for design in this environment. Experimentation and cross-functionality in Gothelf's (2013) list of principles are a perfect match for designing for IoT Overall, the holistic nature of service design and UX design fits IoT in the sense that it can provide the tools to combine product concepts and a service systems as Miettinen (2011) put it. In addition McEwen

and Cassimally (2013) noted that the technological advancements have cut down the costs of internet-capable computing and it makes prototyping with connected products and services possible to a wider range of companies.

As the The Design Ladder developed by the Danish Design Centre in 2001 suggests, the use of design can range from no design to design as strategy. The DDC suggests that the use of design as strategy and design as process has seen a rapid increase between 2003 and 2007 (Walsh, 2007). Design as strategy has experienced the fastest increase percentually and the Evolution of UX framework suggests that the increase might be emphasized by the need for transformational design in the coming years.

4. Customer interviews

Design can be seen as a way to deepen the customer relationships. Taking into account all stakeholders and opportunities beyond current software development and needs can be a gateway to create more value for the customers.

Cybercom has a wide array of customers and some of them are very large organisations and companies. This interview chapter's objective is to find out how the customers perceive UX design and service design. The aim was to interview four of the client company's customers in order to to gain insight on what kind of user experience and also IT related consultancy do these companies require for their projects.

The interviewees were selected with the client company supervisor. Interviewees are among the people who work with design and IT outsourcing and had some specific project of theirs to talk about in the interviews. The companies that were participating are Cybercom's current customers. The number of interviews was affected by the fact that my supervisor at the client company suggested that these companies represent different industries (see Table 3).

The interviews were conducted using a theme-based interview with the Value Proposition Canvas by Osterwalder, Pigneur and Papadakos (2014) as the basis. The interviews aimed to fill out customer profiles. The tool was chosen in order to get actionable insights on how design and IT consultancies can create value to these their customers.

Title	Company	Industry
Product designer	Posti Oy	Logistics
Project manager	Outotec	Industrial sector
Project manager	Teosto	Non-profit organization
Creative director	Rapido Media	Public organization

Table 3. Interview companies and participants

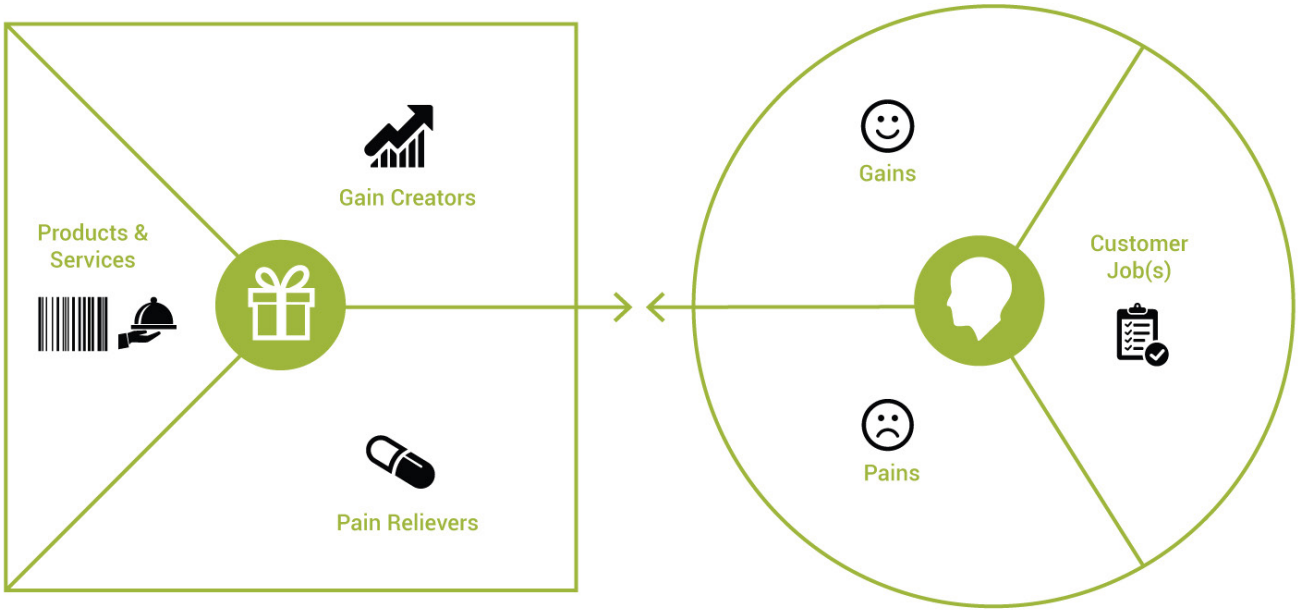

Figure 6. Value proposition map (Osterwalder, Pigneur, and Papadakos, 2014, p.8-9)

4.1 The Value Proposition Design Canvas

The canvas consists of two parts: the value map and the customer profile (see Figure 6). The first step is to fill out the customer profile which describes a specific customer segment in one's business model. It consists of three areas: customer jobs, pains and gains (Osterwalder, Pigneur and Papadakos, 2014, p.8-9).

The customer jobs break down what customers are trying to achieve in their work and their lives. These jobs can be problems that they are trying to solve or needs they are trying to satisfy. The jobs can be arranged in an importance order (Osterwalder, Pigneur, and Papadakos, 2014, pp 12-13).

The customer pains describe bad outcomes, risks and obstacles related to customer jobs. The pains can be functional, emotional or ancillary. They might also be obstacles or risks in using the service or product. The pains can be organized by severity (Osterwalder, Pigneur, and Papadakos, 2014, pp 14-15).

And finally Osterwalder, Pigneur and Papadakos (2014) explain the customer gains: they depict the outcomes customers want to strive for or describe concrete benefits they are looking to achieve. The gains might be something that the customers require, something that they expect, something that they

desire or something unexpectable. They can be arranged by relevance. In other words: how important is the gain to the customer (Osterwalder, Pigneur, and Papadakos, 2014, pp 16-17).

4.2 Findings

This chapter contains the findings of the interview phase. The findings are organized according to the value proposition design canvas model.

Outotec

Outotec ACT is an advanced process control platform for plants. The system gathers and analyzes data from the plant in order to make the process more efficient and the production more optimized. It also visualizes the processes. The customers are plants and their goal is to maximize the productivity of the plant and to some extent minimize the labor. The interviewee is a project manager for the ACT project.

Customer jobs

The main jobs for this customer were handling the roadmap of new features by defining and prioritizing the tasks for the team. A large part of his job is to communicate with the developers. Him and the development team are responsible also for maintaining the the service, by for instance fine-tuning the capacity for the customers. The end-user's (plants) jobs include processing raw materials and producing products/ artefacts.

Customer pains

The customers pains were concentrated on understanding their customers' / end users' (the plants and the operators at the plants) needs. Misunderstanding the need has lead to service features that do not match the expectation of the plants, or faulties and bugs in the system. This leads to decrease in efficiency and in the worst case to a production shutdown. This pain also relates to the need of translating technical requirements, or more or less backtracking to the actual need behind the requirement.

One of the pains related to the ones mentioned above is that the product manager reported 'insufficient visibility' which means that some requirements for new features come as a surprise when the need could have been predicted.

Another critical need for the customer was that he and the development team would benefit from visiting the plants more. In order to observe the plant and interview the operators at work. That would reveal how the system is actually performing. The project manager also

revealed that positive feedback of the features would also be welcome.

One issue was about the labour politics: some automation features for the plants are not welcome since that would lead to cutting down on the plant operators, which is something that labor associations in some countries do not want. Another issue is internal communication, but that was being improved at the moment according to the client.

Customer gains

The customer listed some gains for the service, most importantly the fact that the service is quick to implement thanks to its modularity. That could be communicated more towards the customers. The plants would benefit most from using resources more effectively and other other hand from saving on electricity.

Rapido Media

A project manager for the service was interviewed in order to discover the jobs, pains and gains of the users as well as those of the service providers. Rapido Media is a small media company and Mobichat is their SMS messaging service which is popular with gay men and people looking for excitement in their life. The users tend to be older people. The messages are only 160 characters long because of the technological limitations of the medium, thus a fair amount of abbreviations are used. The messages were first shown on TV, then on the text TV. The latest development in the service is that the messages can be also viewed online. However, the online service does not offer any additional value at the moment, but the possibilities and future development ideas of the online platform were discussed.

Customer jobs

The users try to find company. The three most popular channels are gay, senssi (for older people looking for excitement) and date (which is the same as senssi, but for a slightly younger crowd). Some users even post on many of the channels in different ‘roles’. The users that read the messages then contact author of the message. The service only presents the messages online and on text TV (and in the online text TV). So there are several directions for the service to grow.

Customer pains

The main pain or fear factor for the users is losing their anonymity. Some of the users do not want their spouse to find out that they use the service. Another big issue for the users was the

fact that they knew only what the 160 characters would reveal of the author. So actually meeting in real life is a big step. Also some of the messages are censored and that might change the message totally. A very basic problem for the users is that the messages can not be seen for a very long time. So how could they differentiate from the crowd? Another basic fear is that the messages cost 99 cents a piece, so it is costly to get the attention. And there is no way at the moment to see how much you have spent on the messages in total.

The problem for the service provider is that they would like to have a popular service and online is the place to go. At the moment the service does not offer anything more than the text tv equivalent. An issue connected to that how can they move the users out from the text tv platform to online. What is the additional value?

Customer gains

The interview revealed that there are already some good development ideas based on the customer needs. The users would benefit from more control over how much they are spending on the service. The need for differentiation in one's messages could be tackled with additional services for better exposure in the service. The online service needs to be more clear in terms of typography and other graphical elements as well as the whole front page. The movement towards the online platform should be somehow gradual. The users are used to the service and it works as it is, but the new service should do the same in a similar trustworthy manner, but be better at the same time.

Posti

At Posti we mapped out a typical service digitization project in which a process is being simplified for the user and at the same time made more efficient for the provider. The service that we focused on was an information update service for Posti customers. It is basically a service that is used to check and update mailing lists. This service is a part of a large customer contact portal which is used by corporate clients. The person that was interviewed works as a product designer at the company and is in charge of designing the service at hand as well as other related services.

Customer jobs

The service is typically used when the customer is getting ready for sending a large batch of something valuable via mail, such as a thick catalogue. However, some people might have moved, changed their name or passed away.

The incentive is not to waste valuable material and another motive is just to update the customer information. Then the customer logs into the service and sends over a file and chooses to update the information or just to get an update of the 'condition' of the information (which tells how much the address information has changed). If the user just wants to know the condition of the information, he/she will decide later whether to update the list or not. In case the customer chooses to update directly they will receive an email notification that the list has been updated and heads back to the service to download the new list and a report of the information and the update.

Customer pains

The first pain that the customer encounters is finding the service. They might not be aware that such a service exists and it is not being marketed to any extent. The next issue is cost: what does the service cost and how can they find that out? Another cost-related issue is file type. If the list is not in the correct format, it needs to be converted. The customer can either convert the file theirselves or pay for an additional file conversion service. Another issue is trust: many customers perceive email (which is not secure) as a more secure option for file transfer. Finally, when the customer receives the bill, they might notice that the report and the bill do not use same terms, which of course reflects on the trust towards the service.

Customer gains

It turned out that the people in the company had ideas for improving the service beyond the expectations of the customers. They had an idea on how to tackle the cost issue: by building a cost calculator that immediately provides the user with the price of the service by analysing their file. The service also has to prove and highlight its security better since apparently the online user interface is not seen as the most secure option. Another good idea for creating customer gain was using data visualisation for the report, which is currently not as readable as they would see fit. The report presents numeric data and percentages, thus visualising the information would make the report more digestible.

Teosto

Teosto is a copyright organisation for composers, lyricists, arrangers and music publishers. They collect information about works from the artists who created them and information about musical performances from music users. They also sell licences for music use and collect the royalties on behalf of the

artists. Artists and publishers receive the royalties for use of their music via Teosto. A Teosto project manager was interviewed for the project and we created a customer segment mapping for their event licence service.

Customer jobs

The main need is to notify Teosto about an event and filling out the details. Filling out the information the generates an automatic event license which helps the customer out next time when they organize an event. Next time around the notification form is pre-filled.

On the other hand Teosto observes magazines and information about concerts in order to discover events that have not been notified. Then they send out licence offers to the organizers. These licence offers have a code which the organizer will use to notify the event in case they really have organized that particular event, but have not purchased a licence.

Customer pains

The first issue concerns a first-time user. There is a huge number of licences to choose from and it takes quite a number of steps to get to the actual form. The complications lead to calls to the customer service. Especially the elderly people have a low threshold for calling. Another issue is that some events can not be filled out in one session and registering new users to the system also takes time.

For Teosto the greatest issues are of course customers calling to the customer service when in theory the web service should take care of all the customer needs. Another issue is the fact that the license system is new: previously each notification was separate, but now they all fall under the same licence which is more convenient for Teosto. The licence offer that Teosto sends out faces one issue: some people just don't care if they get an offer this leads to a reminder which causes more work for Teosto.

Customer gains

One gain that the customers have already got is that Gramex and Teosto have integrated the event licence application. Previously people needed to apply for the licence separately from both. Our discussion revealed that the licences would be better displayed if Teosto had a sort of licence web shop where all the licences would be displayed and the application processes would be unified. On a more general level, Teosto would themselves benefit from digitization by having more online self-service.

4.3 Summary and conclusions

The two main topics that came up repeatedly in the Outotec interview are: insufficient knowledge of customer needs and need for efficiency. The fact is that the main customer need in the industry sector is efficiency. However, the great opportunity for design in the industry sector is adding empathy: understanding the customer needs by using design methods.

In the Rapido Media case the big issue is strategic. Where is the service heading? How is it going to grow or even maintain its current position? The whole business model for the service might need updating in the near future since their technology is ageing quickly. There is also a big need for user studies, but the secretive nature of the service does not make it easy to get the users involved. This case also represents the big trend of digitazation. Users, even the older generation, are online and that is why these kinds of services need to go online also. The service is now on the text TV, but the technology is ancient and the future users are online. Another issue in this case is marketing the new service. How can the service providers raise attention for the service? The current users can be informed via the current channels, but there are much more potential users online. And if they can move online, the service business model could be changed into subscription.

Posti's service has all the elements, but the there are many touch points that could be improved significantly. There is room for streamlining the whole customer journey. First of all, the whole address list should also be online, that way Posti could send for instance status reminders. The service definitely needs attention and its value should be communicated to customers: it prevents wasting goods and money. Another issue that should be communicated to the customers is security. The security of the service needs to be proved before even taking the first step. And finally data visualisation could provide a wow effect at the end. It is something that the customers would not expect to see and if done well, it would help the user to understand the information quicker and leave a good impression of the service.

4.4 Interview analysis

What have we learned through this empirical research is that some parts of the value proposition of user experience design fit all customers, but the underlying motives are the one's that differ. Where the industrial company might need more user research in order to be more efficient - the media company

might need user research in order to innovate new the whole business model of one of their services. This chapter presents the analysis of the research data.

In the industry sector efficiency is the key issue and design can have an impact on it, mainly by making users and machines interact better. That can be achieved by better user knowledge and visualization. Efficiency is a good match with Cybercom Groups connectivity theme.

Design has a more strategic aim in some of the cases. The Mobichat case shows that design plays a crucial role in figuring out the business model of a service. Service design methods and user experience can help to define how the service needs to change its design and business model in order to survive. As Daugherty, Banerjee, and Alter (2014) also suggested: technology will have a massive impact on new business models. Especially in this kind of technologically enabled services.

In the case of Teosto, a more holistic point-of-view with real customer focus would improve their service. They should also think about the motive behind paying for a licence. What is the transformation that the customer's are trying to achieve? Pine and Gilmore (2005) pointed out that there is a transformation behind the experience that customers are trying achieve. The fact that the licence fee goes to the artists could be emphasized in order to emphasize that they are, in fact, doing the right thing. Also, a holistic approach to all their services would make sense. And as Moritz (2005) suggested: service design is holistic, multidisciplinary and integrative. Teosto could have a more customer-centric approach instead of licence 'products'. Teosto could also separate frequent users from one-time users better, since that is one defining feature in their customer base.

One of the interviews - Posti - brought up the theme of trust. The users had trouble trusting the service. This is an user experience issue at its purest: how to improve the experience of trust in the service? The issue will get even more critical when more and more devices will be connected (and possibly accessed without permission).

Trust is a huge factor in user experience, especially in services that Posti operates, which hold people's personal information and where financial transactions are made. The users need to trust the service and the service provider in order to have a good experience. In Posti's case the reliability of the service was not being emphasized enough. They had secure payment system from a secure payment provider, but it was not indicated well

enough. User experience designers know this, and I've witnessed how easily trust can be lost in usability tests. And once one part of the service is not trustworthy, the reliability of the whole system collapses in users' eyes. Mukhopadhyay (2014) suggests that security will be one of the main challenges for IoT, but when companies manage to produce secure connected products, the security should also be emphasized. Customers have a healthy prejudice towards connectivity, since the the personal experiences require personal information to operate. Trustworthiness can be also emphasized with good quality in the user experience. If it looks goods, works flawlessly, and responds as one would expect, that enhances trust towards the service.

Some of the customers that were interviewed claim they know the customers and some admit that they don't know the customer needs and would benefit from better knowledge on customers. All of the interviews showed that customer knowledge is important. In Cybercom's case this is an important insight.

Another topic that was lifted from the interviews with Outotec and Posti, is the need for visualisation, especially data visualisation. In the era of data overload, readability and easy-digestion of data is key. It is not an easy task, but a user experience designer needs to understand this.

Rapido Media is on the verge of new technology and most likely needs a new business model in order to cope with the change. Having a multi-disciplinary mindset and trying out new tools such as the business model canvas has been helpful to them. In many of the interviews we discussed the value proposition. What are these companies offering to their clients. It was not clear to all of them. Or at least it had not been crystallised to anything easy to grasp, although they all had good, useful services.

All of the above issues are something that design has the ability to improve upon. These along with the literature findings are building blocks for the following initiative for the client. In the end the theme that fits well to the global theme of connectivity at Cybercom is what was discussed with Outotec: efficiency and connectivity. Another theme that can suit the client company's agenda from these interviews is the technological change and the resulting need for new business models which was the issue at Rapido Media. And one more important finding is that for example Teosto needs a more holistic approach to their products and services.

5. Summary & Conclusions

The purpose of this chapter is to present a summary and conclusions of the research as well as the application of the learnings and final outcome of the thesis project. In addition to that, the chapter will present the author's reflection on the work and the next steps generated by the outcome.

5.1 Applying the learnings

What started out as a study of a shift from UX to service design, became a learning journey through the differences and nuances of the ever-changing, complex field of design and the rapidly evolving IT industry.

What does all this translate to in terms of Cybercom Finland Design Studio? Being a service design consultancy is good for now, but what could be the next steps?

This chapter combines all the research insight and reflects the findings on the client company's strategy in order to form new design initiatives (see Figure 7).

Design for connectivity and IoT

By looking at the needs of the client company's customers in the interviews and the global connectivity-related

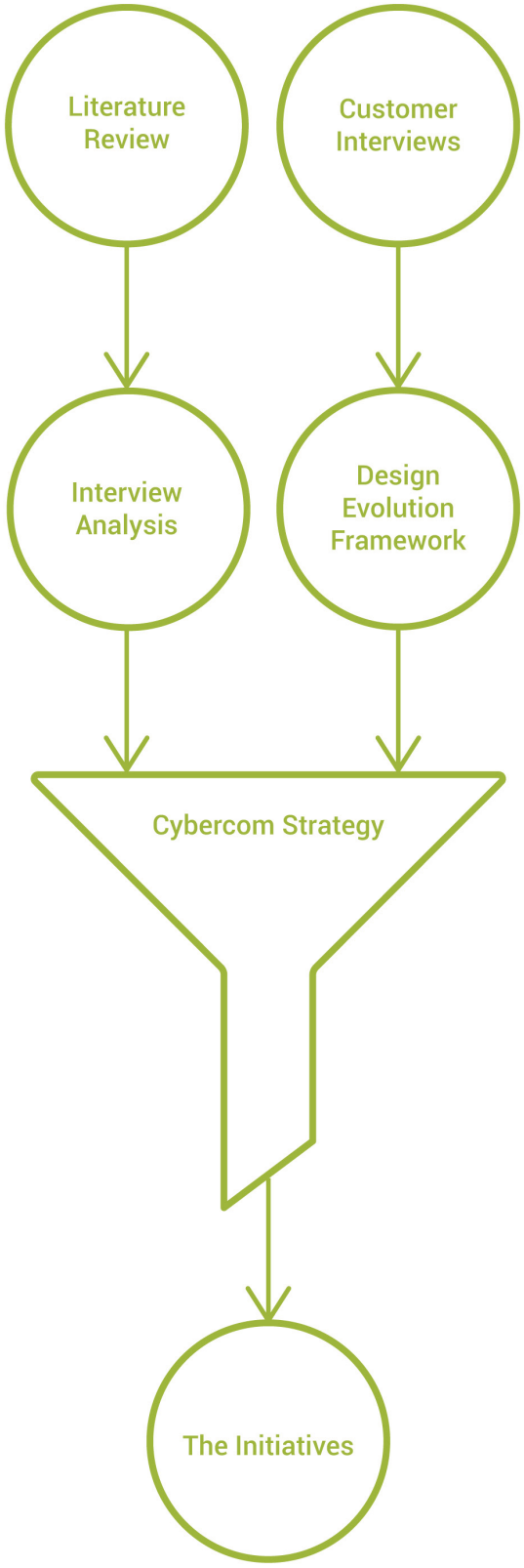

Figure 7. The thesis process

themes of Cybercom as well as the current technological developments, it became obvious that my mission is to contribute to the client company's connectivity and IoT projects with design. Another thing that affected my direction was that by exploring the history UX, I concluded that designing for the IT industry tends to break down to new specialized roles. I argue that connected experiences will be an area of specialization in design in the future. My background in industrial design has also had it's influence on how this direction was formed, since my education makes me a designer of the physical world and in my current work I design for the digital world. Connectivity is about connecting these two: the physical and the virtual into one coherent experience. Connectivity also typically changes business models from product-centric to service or hybrid business models where a product meets a service (which is these days typically a digital one). This can be good to Cybercom, since also traditional product companies are suddenly in their scope when physical products are getting connected.

Malik (2014) suggest that connectivity will also help to make tasks more effortless and even invisible to the user. This is one area where UX design will be able to assist companies like Outotec in their quest for efficiency. In this quest investigating the user needs is vital as well as visualising information and design can provide these elements to the process.

During the process of this thesis I took the first step and arranged a meeting with our company's connectivity evangelist since my company supervisor suggested to do so. My concern was that connectivity was too business and engineering driven. Design would contribute user insight and empathy to innovating new connectivity concepts. The fact that IoT and connectivity are very trendy at the moment also contributed to my choice of direction.

Service design

The Teosto interview proved that in that customers need designers that can think holistically and the underlying motives of customers. Since now they had just plain old products and users have to figure out which one they need for themselves. Holistic service thinking might make the customers more committed and make their task easier.

Admittedly, service design has many qualities that will make it relevant in the future. The interviews at Posti and Outotec concluded that data visualization is needed. Service design is specifically an approach that embraces

visual communication. The approach will also meet the needs of the future by approaching business problems in a holistic way. According to Miettinen (2011) connectivity is making the product and the service inseparable and service design will suit those design needs perfectly, since it approaches the service as one whole.

Lean UX

As I progressed with my research I reminded myself that whatever I contributed, needed to fit the IT industry. But what makes it different from for instance industrial design (which I have a bachelor's degree in)? My experiences tell me that the main difference is that in industrial design the product design has to be final before moving on to production. The product can be prototyped and tested with real users just like in digital design, but producing and designing at the same time is not possible. This is the thing that made me realise the true meaning of lean UX. Until this point it was another buzz word.

The literature review came to show that even classical ergonomy was struggling with the same issues as user experience today: the issue of incontinuity. Back in the day the ergonomists work was in the form of guidelines and reports just as they are nowadays too in many cases.

Experience from project work

Working on other project during the course of my thesis was a great benefit. The thesis research made me realize that there are ways of doing UX design that our company is not using in a large scale. Such as lean UX and agile UX. These approaches would solve some issues in our project work. The lean UX methodology would solve issues in the design phase such as the discontinuity of design projects. In many projects the customer buys a design project and a software development project separately. I find that a mistake. They are both essential parts of the project. And in many cases the projects are not connected to each other well enough and some of the design work goes to waste.

And there is no guarantee that those guidelines will be followed properly.

Lean UX can tackle the incontinuity and isolation of some design projects at Cybercom, but this kind of change needs to be promoted on a higher level. Sales people need to be informed that this is how we work and this is what kind of project management we apply (and how it prevents customers from throwing money away on things that users do not use), developers need to be active in involving the designers in the development process and designer need to take time and see that designs are seen through well enough.

Lean UX and it's ways of working are something that I and our designers will bring up when agreeing on new projects. This will be added to our offers that go out to new clients in the future. The customers need to understand that design has to be continuous.

Applying Lean UX method will also help breaking the traditional siloed organizational structure. The history of user experience design shows that software developers actually used to be multi disciplinary generalists, before they evolved into specialists. Now the direction is backwards: specialists are becoming generalists, but that is conscious this time. Generalists have understanding for other disciplines and that boosts teamwork. The generalists back in the day did not know better, they just did what they had to do to get the software done.

Some projects that Cybercom Finland takes on can not work in a pure Lean UX manner since the approach favors co-locating the whole team. Some projects have external development teams provided by the client or some other consultancy. As Jeff Gothelf's book Lean UX suggests, designer and developers should work side by side. This ‘rule’ should always be in mind when starting new projects. Designers need to get their hands dirty with the development team. Co-locating designers and developers should work at least in those cases where the designers and developers are in the same city.

The transformational experience economy

User experience in the connected world will be more about experience than use. As Pine and Gilmore (2011) explain in their book The Experience Economy - experiences will become more personal and memorable. Connectivity will boost both of these themes by offering more personalized experiences and thus they will be more memorable. However, the underlying need for transformation

Experiences from sales meetings

During the process of writing this thesis I was fortunate enough to participate in a number of sales meetings. These meetings include a large international pharmaceutical company, a large international recruiting company and a finnish waste management company. As a design consultant my task is to present the right kind of tools or approach for the customer, the kind that would solve their problems. I have been able to test my assumptions on how customers respond to service design and how it should be presented.

My experiences tell me that what customers want these days is a flexible way to buy design services rather than fully pre-defined projects. On the other hand they need detailed descriptions of how the whole project would be executed even if they only want to outsource a part of it. The price and work hour estimate are very crucial. Many of the customers seem to get excited of the idea of service design, especially the user-centric aspects of it. The culture of being lean and testing ideas quickly seems to be gaining popularity and clients understand why projects should be run like that. Service design does incorporate some elements of the lean movement, but that should be emphasized more.

Another thing that I have noticed in sales meetings that I have attended myself or just have second-hand information on is that clients want to participate in service design although they are not designers themselves. There has been now three occasions recently where clients have decided to perform user interviews themselves, but do not feel confident to continue from that point on by themselves. These clients have all been from different industries: pharmaceutics, property maintenance and recruiting, which tell me that the phenomenon is quite universal. I find that encouraging and worrying at the same time, and in this kind of situation the designer need to offer their expertise and cooperate in the design process as much as possible. The result could be that the relationship between designer and client becomes deeper than just having two separate roles.

plays a key role and design is the only discipline that possesses the ability to discover that need and translate it into an experience. Take for instance Teosto: people can easily decide not to buy a music licence and they will most likely not get a penalty for it. But tapping into their need for doing the right thing and crediting the artist can be the key to an increase in licence purchases. The service just has to be close to the customer an easy to use.

Value creation in the consultancy environment

Clearly a part of the project was to concretize the value of the new design initiative. It is a common for the whole design industry. I came to grips with this in my international design business management industry project during which we interviewed design agencies. The message was clear, some companies understand the value of design, but to some it needs to explained.

As Borja de Mozota (2001) suggested: having sufficient competence in the topic matters. For Cybercom design studio this means that there needs to be a targeted portfolio for IoT service design projects that can be presented to potential connectivity clients.

IoT, Service design and Lean UX

As a designer my concern in the internet of things is that the technology is so magical and enchanting that it may become the sole driver for designing new products. This should not happen, smart object must serve a purpose and the solve real problems of real users.

According to Pine and Gilmore (2011) we live in an experience economy where the personal memorable experiences rule. Those who can create these experience will be the winners. My conclusion is that these kind of experiences can be created in the digital world only by using IoT for personalization and service design to stage the memorable touch points in the experience.

Experience staging takes into consideration the visual and the tactile, but there's much more to experience. This is where IoT comes in: being connected enables staging experiences on another level, our mobile and wearable devices along with the ones in our homes and cars enable more personal and memorable experiences. This kind of symbiosis and constant interaction with technology can enable transformation.

All this of course needs to be executed in an iterative way which can be managed in a lean UX manner with multidisciplinary teams. I suggest that in the future there will not be a gap between design and development. They will both be continuous and the product or service will thus be able to evolve with user needs.

5.2 The Initiatives

Eventually the thesis project produced two initiatives for the client company. I presented the proposal to Cybercom Group's connectivity evangelist who is located in Sweden. My final proposals combined design for connectivity and IoT with Lean UX working methodology. In the end my thesis is a round-up of the environment that surrounds the client company's design unit. These conclusions have been carefully thought over to suit the objectives of the client company as well as the global technological trend.

The client company provides consultancy services, so the initiative needs to fit that business model. Cybercom does not really offer product or solutions for IoT, but skilled advisors that know the business and the technology aspect that are tied to IoT. That is how my initiative was born. Out of the realization that business people and technical people are already well on their way in IoT.

Connectivity design

IoT service designer

As Rowland (2015) suggests, IoT is still a very technology-driven field. The first step towards the right direction is to have designers that are interested in connectivity and want to participate in connectivity projects. This is the first step towards a multidisciplinary approach in the connectivity services. The connectivity or IoT design consultant is just like any design consultant, apart from the fact that his/her main area of focus is connectivity. The main task for this role is of course considering user experience, but other tasks would include business modeling, holistic IoT visual service mappings and ideation interviews. The position requires a specific skillset in concept and possibly industrial design or technology, but most importantly enthusiasm and drive for new ideas to look at products and services through connectivity. This approach matches the client company's key value of innovation perfectly.

When the concept has been created and the service development begins, the IoT service designer is a part of a lean

UX team that declares assumptions, creates MVPs, runs experiments and goes through feedback and research.

How would the IoT service designer help the interviewed companies then? He/she would have the required skillset to combine Outotec's technological knowledge and their users' needs into new valuable services or product functionalities that provide visual easy-to-grasp data visualisation. Or help companies like Rapido with innovating their business model and technology platform.

Connectivity lab

The connectivity lab is not necessarily a physical space, but a mental one. It is an initiative that aims to connect designers, developers and business people to innovate new connectivity solutions. As suggested by Hughes (2013) this creative process - innovation - needs to be managed. That is exactly the issue that the connectivity lab would address. The client company has many potential connectivity customers and they need to be convinced. The connectivity lab could create concepts or even POCs (proof-of-concept) for clients. This would also create more reference cases to the client company for future sales. The interview with Rapido Media suggested that they would benefit from a partner with skills in managing innovation since their service is struggling as it is.

In addition to this I see the need to educate and spark conversations with the client company's design team as well as everybody else. There are monthly presentations about current topics in the company. The internet of things and especially design for IoT would fit that mold. Presentations would spread the word and help the mission of finding IoT projects and implementing service design.

5.3 Reflection and next steps

This chapter presents the author's thoughts about the thesis process and project, as well possible next steps for the thesis project.

Reflection

After conducting the interviews with clients some time passed and my thesis progressed slowly. I attended several sales meetings and read more literature on the subject. This is when I realised that having service design as the main topic of the thesis would not prove useful to the client company. The service design methods were all there and in use already. I understood that the opportunity

for improvement was elsewhere. I might have known the issue subconsciously already. Design projects were too separated from the actual doing. The work on bridging the gap between the design project and the development started already when I was writing my thesis and that is why I decided to pursue the other theme of interest: design for connectivity. Now I hope that the theme of design for connectivity will catch on and generate new projects and interest on the customer side.

The thesis writing process has been absolutely vital for my professional evolution since I know much more about the industry now and also have an opinion to where the industry is going in the future. The writing process was long and the greatest leap came from having discussions with my thesis supervisor from Aalto: Peter McGrory and from Cybercom: Susanna Härkönen. I have been working during the thesis writing process, but I think that it has had good and bad influence on the thesis. Good in the sense that rather from just working, I have been reflecting the things that I have read on my work life and projects. And naturally bad since there was sometimes the issue of not having enough time.

Another thing that the process has made me realize is the importance of IoT. It's something that user experience designers have to research consciously. It is something that will make product and service innovations possible in the future. I know that all user experience designers will not be as excited about it and do not need to be, but I am. Maybe that has something to do with my industrial design background and it also has something to with the fact that the business opportunities in the IoT field are massive.

A positive impact of my thesis work is that our design studio is gradually moving towards a leaner UX methodology and taking up for instance new rapid prototyping tools since I try my best to promote their use. There is also a growing desire to create cross-functional teams in projects.

Next steps

Presenting my ideas to our connectivity evangelist worked out and I may get a position from as an advisory consultant of design for IoT projects within the group. My next task is to describe the first steps for a IoT design workshop that would be offered to clients in the beginning of suitable new projects. I will use the findings from this thesis to create an agenda for the workshop. The connectivity lab did not produce same kind of a reaction. Since the client

company already has some IoT reference cases that can be used in customer presentations. We will see however, when those suitable projects emerge. Getting them needs a holistic point-of-view also in sales since the customer briefs are typically more narrow.

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Appendices

Appendix 1. Customer interview questions

Customer jobs

What is the one thing that your customer couldn't live without accomplishing? What are the stepping stones that could help your customer achieve this key job?
What are the different contexts that your customers might be in? How do their activities and goals change depending on these different contexts?
What does your customer need to accomplish that involves interaction with others?
What tasks are your customers trying to perform in their work or personal life? What functional problems are your customers trying to solve?
Are there problems that you think customers have that they may not even be aware of?
What emotional needs are your customers trying to satisfy? What jobs, if completed, would give the user a sense of self-satisfaction?
How does your customer want to be perceived by others? What can your customer do to help themselves be perceived this way?
How does your customer want to feel? What does your customer need to do to feel this way?
Track your customer's interaction with a product or service throughout its lifespan. What supporting jobs surface throughout this life cycle? Does the user switch roles throughout this process?

Customer pains

How do your customers define too costly? Takes a lot of time, costs too much money, or requires substantial efforts?
What makes your customers feel bad? What are their frustrations, annoyances, or things that give them a headache?
How are current value propositions under performing for your customers? Which features are they missing? Are there performance issues that annoy them or malfunctions they cite?
What are the main difficulties and challenges your customers encounter? Do they understand how things work, have difficulties
getting certain things done, or resist particular jobs for specific reasons?
What negative social consequences do your customers encounter or fear? Are they

afraid of a loss of face, power, trust, or status?
What risks do your customers fear? Are they afraid of financial, social, or technical risks, or are they asking themselves what could go wrong?
What's keeping your customers awake at night? What are their big issues, concerns, and worries?
What common mistakes do your customers make? Are they using a solution the wrong way?
What barriers are keeping your customers from adopting a value proposition? Are there upfront investment costs, a steep learning curve, or other obstacles preventing adoption?

Customer gains

Which savings would make your customers happy? Which savings in terms of time, money, and effort would they value?
What quality levels do they expect, and what would they wish for more or less of?
How do current value propositions delight your customers? Which specific features do they enjoy? What performance and quality do they expect?
What would make your customers' jobs or lives easier? Could there be a flatter learning curve, more services, or lower costs of ownership?
What positive social consequences do your customers desire? What makes them look good? What increases their power or their status?
What are customers looking for most? Are they searching for good design, guarantees, specific or more features?
What do customers dream about? What do they aspire to achieve, or what would be a big relief to them?
How do your customers measure success and failure? How do they gauge performance or cost?
What would increase your customers' likelihood of adopting a value proposition? Do they desire lower cost, less investment, lower risk, or better quality?