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Annika Oukka

Self-service User Experience for Business-to-business Financing Service

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Supervisor: Professor Marko Nieminen
Advisor: Professor Marko Nieminen

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ABSTRACT OF MASTER'S THESIS

Author:	Annika Oukka
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Several companies offer online loans for small and medium sized businesses in Finland. There seems to be no clear differentiating factors between the services of these lending companies. One possible differentiating factor could be the offering of a better user experience for the customer companies in the future. This work is done for an online lending company called Luottorahoitus.

This study examines what kind of user experience should be designed into a business-to-business financing service. The objective of this thesis was to conceptualize and design a self-service system for Luottorahoitus customers. The main objectives for the system are to improve customers' user experience and establish more loyal customer relationships.

I applied user experience design together with persuasive design in designing the self-service system. During the work I analyzed the user data and interviewed the users to construct the potential user groups for the self-service system and to understand their needs. Based on this understanding I innovated and implemented an user interface prototype with persuasive features. I conducted user testing to evaluate how well the prototype filled the users' needs. In addition I evaluated what persuasive principles could affect the users' behaviors using expert evaluations.

As results of the study I can state that the persuasive user experience designed in the self-service system depends highly on behavior change the system aims for. The designed system filled the evaluation criteria for the persuasive user experience well. Based on the results I can say that the persuasive features designed into the system, especially rewards, reminders and self-monitoring, can affect the users' target behaviors positively in the context of business-to-business online financing. The target behaviors of the system were better payment behavior and customer loyalty. All the test users perceived the system as a useful tool for managing their loans and valued its easiness of use and simplicity.

Keywords:	persuasive design, user experience design, B2B financing, online lending, self-service system
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Suomessa on useita pienille ja keskisuurille yrityksille suunnattuja verkossa toimivia luotonantajia. Näiden tarjoajien palveluiden välillä ei kuitenkaan ole nähtävissä suuria erottumispiirteitä. Yhtenä mahdollisena erottumistekijänä tulevaisuudessa voidaan nähdä entistä paremman käyttäjäkokemuksen tarjoaminen asiakasyrityksille. Tämä työ on tehty yritysluottoja tarjoavalle online-palvelu Luottorahoitukselle.

Tämä työ tutkii sitä, millainen käyttökokemus yritykseltä yritykselle rahoitusta tarjoavan palvelun itsepalvelusysteemiin tulee suunnitella. Työn tavoitteena on konseptoida ja suunnitella itsepalvelujärjestelmä Luottorahoituksen asiakkaille. Järjestelmän pääasiallisena tarkoituksena on parantaa Luottorahoituksen asiakkaiden käyttäjäkokemusta ja luoda lojaalimpia asiakassuhteita. Järjestelmän suunnittelussa hyödynnetään käyttäjäkokemussuunnittelun sekä suostuttelun ja houkuttelun periaatteita.

Työn aikana selvitettiin järjestelmän potentiaaliset käyttäjäryhmät ja niiden tarpeet käyttäjätietojen analysoinnin sekä haastattelujen avulla. Tämän ymmärryksen pohjalta innovoitiin sekä toteutettiin käyttöliittymäprototyyppi, jossa hyödynnettiin suostuttelun periaatteita. Lisäksi työssä arvioitiin käyttäjätestien avulla, kuinka hyvin käyttöliittymä vastasi käyttäjien tarpeita sekä asiantuntija-arvioiden avulla, mitkä järjestelmässä olevat suostuttelun periaatteet voivat vaikuttaa käyttäjän käytökseen.

Työn tuloksena voidaan todeta, että systeemiin suunniteltava käyttökokemus on pitkälti riippuvainen siitä, millaiseen käytökseen systeemillä pyritään vaikuttamaan. Työn aikana suunniteltu järjestelmä täytti sille asetetut käyttäjäkokemuksen sekä suostuttelun vaatimukset onnistuneesti. Tulosten perusteella voidaan sanoa, että järjestelmään suunnitellut houkuttelevat ominaisuudet, erityisesti palkitseminen, muistutukset sekä oman käyttäytymisen seuraaminen, vaikuttavat tässä kontekstissa positiivisesti käyttäjän kohdekäyttäytymiseen eli parempaan maksukäyttäytymiseen ja asiakaslojaaliuteen. Kaikki testikäyttäjät kokivat systeemin lisäksi hyödylliseksi apuvälineeksi luottojen hallintaan ja arvostivat sen käyttökokemuksessa erityisesti sen helppokäyttöisyyttä ja yksinkertaisuutta.

Asiasanat:	suostutteleva suunnittelu, käyttäjäkokemussuunnittelu, B2B-rahoitus, online-luotonanto, itsepalvelusysteemi
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Abbreviations and Acronyms

B2B	Business-to-business
CX	Customer experience
FinTech	Financial technology
IS	Information Systems
PDF	Portable Document Format
PSD	Persuasive System Design
SME	Small and medium-sized enterprises
SST	Self-service technologies
UI	User interface
UX	User experience

Contents

Chapter 1

Introduction

1.1 Background

Small and medium sized companies represent the majority of firms in Finland and they play a large role in the national economy (Kuismanen et al., 2017; Masiak et al., 2017). These companies have been in a lack of financing in the resent years because of the tightened or changed credit policies of financiers and the tightened collateral and borrowing requirements (Kuismanen et al., 2017). Banks have been reluctant or unable to finance these companies because of the weaken creditworthiness of the small and medium sized companies (Kuismanen et al., 2017).

Financial technology companies have responded to the problem of lacking finance by providing several innovations in financial lending services (Lee and Shin, 2018). Mills and McCarthy (2014) state that the lending industry has changed when lending companies have started to offer online loans targeted to small companies. They explain that the lending companies have made the loan processes easy and fast, available anywhere and anytime. These online lenders have simplified the lending processes compared to banks and made their services more engaging (Mills and McCarthy, 2014). According to Mills and McCarthy (2014) one of the top future trends for online lending services is to focus even more on the user experience of these services.

ISO (2010) defines user experience as "person's perceptions and responses resulting from the use and/or anticipated use of a product, system or service". When designing for user experience, different viewpoints can be considered. Persuasion in user experience design has surrounded us within the last two decades (Fogg, 2009b). Persuasive design is used to build systems that persuade and motivate their users to use them and improve the overall user experience (Némery and Brangier, 2014). Today a large amount of technologies and services are using persuasion to change behavior or attitudes of their users (Oinas-Kukkonen and Harjumaa, 2009).

This project is done for Luottorahoitus, which is a Finnish online financing company. Luottorahoitus provides an online lending service, which enables small businesses to get short-term financing. Luottorahoitus provides loans between €3000 and €50 000 with payback periods of 1 to 12 months. Luottorahoitus loan application process is quick and easy. The online application can be filled in and submitted in minutes. The

granting decision of the loan is made during the same day. In the case of an approval money is paid to the borrower in zero to two banking days. The loan payback period starts after one month of the approval. The loan with expenses is paid back monthly.

Luottorahoitus sees the need for improving its service even more. Even though the loan application process works fluently, the customers need support from the customer service regarding the loan payback process. The company wants to offer its customers a solution to their loan management needs as self-service system. In this way Luottorahoitus can improve its customers' user experience and establish more loyal customer relationships.

I and the company experts believe that by combining persuasive design and user experience design, we are able to create a supreme user experience for Luottorahoitus self-service users that not only responds to their needs but attracts and rewards them when using the system. The company experts include the CEO of Luottorahoitus and a Luottorahoitus board member, both of whom are experts on the financing domain.

1.2   Objective and Research questions

The objective of this thesis is to conceptualize and design a persuasive mobile and web-based self-service information system for the purpose of improving Luottorahoitus user experience, establish more loyal customer relationships, free resources from customer service and make additional sales.

The objectives of the self-service system are to provide customers an effortless, attractive and rewarding way to manage their loans and invoices themselves and to sell more for existing customers and learn more about customer behaviour based on data gathered in the system.

The system users will be a subgroup of all Luottorahoitus customers, who take the system into use. With the system the users are able to track their loan and invoice statuses. They can easily perform actions such as requesting for extended due dates for invoices and download balance certificates by themselves. Users can apply for new loans and Luottorahoitus can provide personalized loan offers through the system for users based on their payment behaviour.

The system will provide several benefits for Luottorahoitus. It gives Luottorahoitus the opportunity to free resources from customer service, when customers act as resources in the service activities. With help of the data gathered from the system Luottorahoitus can get to know their customers better. Knowing the customers and their needs gives the opportunity to develop more loyal customer relationships by offering loans with discounts for existing customers with good payment behaviour. Customers taking new loans lead to more sales.

Neither taking the system into use nor keep using it will be mandatory for the Luottorahoitus customers. This is why it is not enough to provide the customers an easy to use service. The system has to provide an user experience that persuades the users of the self-service system to the extent that they start and continue to use the system. This is why the system will be designed using persuasive characteristics to improve the user experience.

Because we want to create a persuasive system to serve Luottorahoitus customers we have to understand the customers, their needs and the use context of the system. I want to assess whether the system actually meets customers' needs and wants and if it does this in a persuasive manner. To achieve this, I will conduct evaluation with users and against persuasive characteristics.

The **main research question** for this thesis is:

"What kind of persuasive user experience should be designed into a B2B financing system?".

To be able to answer this question, I divide it into sub-questions associated with the above-mentioned objectives. The two research questions are following:

- **RQ1**: *Who are the users of the persuasive B2B self-service system (RQ1a) and how can the design meet their needs (RQ1b)?*
- **RQ2**: *How to evaluate persuasive user experience of a self-service system?*

The main focus of the business context of this work is on external funding and more specifically on short term, unsecured online lending. Understanding other financing options goes beyond the scope of this thesis.

Moreover, this work focuses on the user experience of the self-service system and we will not study the customer experience of the whole Luottorahoitus service even though the users are also referred to as customers. I will not conduct en extensive user research during this work but only form a rough overview of the future users and their needs.

The focus of the design is in the design and implementation of a persuasive mobile application prototype. I will not implement a prototype of the web application but conceptualize the system that applies also for the web. In addition, the evaluation of the long-term user-experience and long-term effect of persuasive characteristics in the design are out of the scope of this thesis because of the limited time resources.

1.3 Structure of the Thesis

The research approach of this study follows the Information Systems Research Framework by Hevner et al. (2004). The framework can be used to understand, conduct and evaluate design-science research by producing solutions that intend to solve organizational problems (Hevner et al., 2004). According to Hevner et al. (2004) the "knowledge and understanding of a problem domain and its solution are achieved in the building and application of the designed artifact".

Building of our design solution, *the artifact*, starts by gathering understanding from the business domain and the users as well as their needs in Chapters 3 and 5. Chapter 4 introduces persuasive user experience design in the context of this study. In Chapter 5 I describe the building process of the new persuasive design solution that aims to meet the needs of the users. In Chapter 7 I evaluate this design solution as

Phase	Method	Research question (RQ)	Results in chapter
Analysis	Analysis of business context, benchmarking, collection and analysis of customer data, creating personas and scenarios, analysis of persuasion context	RQ1a	2, 5, 7.1.3
Design	Sketching as idea generation	Main RQ, RQ1b	6.1, 6.2
Implementation	Lower fidelity prototypes, higher fidelity prototype with persuasive features	Main RQ, RQ2	6.2, 6.3
Evaluation	Prototypes evaluated with users, expert evaluation of persuasive features	RQ2	7.1, 7.2
Conclusions and Discussion	Discussion about resulting persuasive self-service system and the applicability of the results into other B2B services	Main RQ	8

Table 1.1: Project phases and research questions

suggested in the Information Systems Research Framework by Hevner et al. (2004). The design process is iterative and I will implement two iterations of the process during this study. Table 1.1 presents the project phases as well as the research questions that are addressed during these phases.

Chapter 2

Business context

In this chapter I give an overview of the business background for this thesis. The first section focuses on small businesses, their financial needs and available funding options. More specifically I introduce different kinds of long- and short-term external funding options. Then we take a closer look at online lending services as a way for short-term funding for small companies. The second and third section introduce the current lending service of Luottorahoitus and other related services. In the last section the focus is on future trends of online lending services.

2.1   Financing small businesses

Economic importance of micro and small companies is high because they represent the majority of firms (Kuismanen et al., 2017; Masiak et al., 2017). According to Kuismanen et al. (2017) the total amount of companies in Finland in year 2017 was 284,000 [1]. Their study reveals that 93.4% from these companies were micro companies and 99.8% small and medium sized businesses. The turnover of small and medium sized businesses was nearly 60% of the total turnover of all Finnish companies, which was €379 billion (Kuismanen et al., 2017).

The EU commission defines small and medium size businesses (SMEs) based on the company's staff headcount and either company's turnover or balance sheet total. Micro companies are defined to have less than 10 employees, small companies less than 100 and medium sized under 250 employees. A micro company's turnover is no more than €2 M, small company's up €10 M and medium sized company's up to €50 M. (EU comission, 2018)

According to Mills and McCarthy (2014) small businesses typically create two thirds of the new established job positions. In Finland all companies created together 1,370,000 job positions, from which 66% were created by SMEs (Kuismanen et al., 2017). This shows the importance of the SMEs for the Finnish labour market.

Kuismanen et al. (2017) point out that the economic growth has accelerated in recent years. However, they report that the amount of growth seeking companies in Finland has decreased. Striving for growth is important because it increases the

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[1]Agriculture, forestry and fisheries sectors are excluded from this amount.

change for a company to survive, improves its competitive position and profitability and creates new job positions (Kuismanen et al., 2017; Davidsson, 1997; Dobbs and Hamilton, 2006).

Only one out of ten Finnish SMEs were strongly growth-oriented whereas 37 % stated they plan to grow if possible. The rest of the SMEs were not targeting growth. One third of SMEs tried to maintain their current state and 19% had no plan for growing their businesses. These numbers differ between industries and different sized and aged companies. For example, medium sized companies and companies on the industrial section tend to be more growth oriented. (Kuismanen et al., 2018)

To be able to succeed or grow small companies have to develop their business constantly. Development requires more investments in businesses (Kuismanen et al., 2017). And investments require financing. According to Kuismanen et al. (2018) small companies typically need financing for investing in machines, devices, equipment and constructions. They explain that small businesses use financing as working capital for aiming for growth and international markets as well as for development projects and educating their employees. Working capital is required for coping with economical cycles or for other economical reasons (Kuismanen et al., 2018).

One out of ten Finnish SMEs state that they have been in a need for financing during the last year. However, they have not applied for any funding. This is partly due to the tightened and changed credit policy of financiers and for example tightened collateral and borrowing requirements. Furthermore, the creditworthiness of the SMEs have weaken. Even though the economic growth the amount of SMEs with payment difficulties has increased. (Kuismanen et al., 2017)

The lack of financing has clearly been a problem since the financial crisis in 2008 (Mills and McCarthy, 2014). The problems can still be seen in the available financing. Every seventh Finnish SME says they could not fulfil important projects regarding investments, development or marketing because of missing financial support (Kuismanen et al., 2018). Mills and McCarthy (2014) questions whether there is a gap in lending for small companies?

2.1.1   Funding options for short and long term financial needs

Types of financing can be categorized in several ways. Funding can be internal or external (Masiak et al., 2017; Dobbs and Hamilton, 2006). External funding can be either short term or long term (Masiak et al., 2017; Volkmann et al., 2010) or equity or depth based (Volkmann et al., 2010). In this section I introduce options for external funding. I will not cover the topic of internal funding because it is outside the scope of this thesis.

Rikama (2015) emphasizes that the need for external funding is crucial for SME businesses. Of the Finnish SMEs, 45% have used some external funding options (Kuismanen et al., 2018). In year 2015 14% of SMEs informed they had mainly used external funding to finance their investments (Kuismanen et al., 2018; Rikama, 2015). Companies targeting growth have the largest need for external funding. Even half of the growth targeting companies had taken external funding in 2015 (Rikama, 2015).

Banks are the largest source for external funding for all small and medium size

businesses (Beck et al., 2008; Mills and McCarthy, 2014; Kuismanen et al., 2018). In Finland 73% of SMEs that had applied for loan had applied it from bank (Kuismanen et al., 2018).

Kuismanen et al. (2018) report that one third of the Finnish companies, which had applied for external funding had applied it from financiers or financial institutions. They explain that in Finland public funding is usually applied from Finnvera (22%), Tekes (14%) and from ELY-centers (13%). Finnvera has for long been one of the most important funding options alongside or as an alternative to bank funding Rikama (2015). Other sources for external funding are for example private equity investors, business angels and insurance companies (Holopainen, 2017; Kuismanen et al., 2018).

The above-mentioned funding providers offer short- and long-term loans. Short-term financing can be applied from banks, financial institutions and online lenders and it can be secured or unsecured. Small companies usually use unsecured short-term financing for financing current assets and working capital to improve liquidity (Volkmann et al., 2010). There are differences between financing patterns of different sized SMEs. Masiak et al. (2017) explains that micro firms for example tend to use more internal financing but more short term-depth and other debt-financing instruments than larger SMEs. In the next sections I focus on short-term online lending as a funding option for small businesses.

2.1.2 Online lending services

Banks have not emphasized small-business financing to a large extent (Mills and McCarthy, 2014). According to Mills and McCarthy (2014) banks have faced problems in finding borrowers that are creditworthy and have therefore been less focused on funding smaller businesses. They point out that lending for smaller businesses bears a higher risk because their economy is not as stable as the one of larger companies.

Banks lacking willingness or capacity to finance small businesses has given an opportunity for new players to serve SMEs (Arora, 2015). These technology-enabled companies, also called FinTech (Financial technology) companies, are providing many innovations in financial lending services (Wille et al., 2017; Lee and Shin, 2018). They have started to fill the gap in financing to smaller businesses (Lee and Shin, 2018; Arora, 2015).

The USA has been a forerunner in the online lending. OnDeck, founded in 2006, was one of the first small business online lending companies (*OnDeck*, 2018a). Short after OnDeck several other online business lenders have emerged the market. Companies like Kabbage, Lending Club and Biz2Credit offer business loans for small businesses with different kinds of business models from balance sheet lending to peer-to-peer and marketplace lending (Kabbage, Inc., 2018a; Lending Club, 2018; Biz2Credit, 2018a). Finland has followed the example of these growing businesses. Many online lenders have entered the Finnish lending market offering short-term online loans, Luottorahoitus being one of them.

These companies offer unsecured loans with higher risks and therefore their loans are expensive. Yearly interest rates of online lenders' loans can be from 44.36% to 128.40 %. Online lenders that offer financing similar to crowdfunding have lower

interest rates from 4% to 20%. (Yrityslainat.net, HL MediaDesign Oy, 2018)

Regardless of the high prices these online lenders provide valuable financing options for small businesses that cannot get funding elsewhere. Many small businesses could for example get the money from banks but choose rather online lending services with higher prices. This is due to the fact that they can get capital quickly and focus their resources on their business. (Mills and McCarthy, 2014)

Instead of going through traditional time-consuming loan application processes online lending companies offer SMEs more efficient loan processes. While a traditional loan application and approval process have typically taken several months, the modern web and mobile interfaces can reduce that to even minutes (Mills and McCarthy, 2014). Luottorahoitus as well as the other online lenders offer web and mobile loan applications, which borrowers can easily and quickly fill in and apply for short-term loans. If the online lending service provider approves the application, the company can sign the contract electronically and get the money quickly to their bank account.

The effectiveness and easiness of the loan application processes of the online lenders are enabled by automated processes, APIs, data aggregation, predictive modeling and electronic payments (Zaikovska-Daukste, 2018; Mills and McCarthy, 2014). By making use of these technologies information required to fill in an application can be minimized, and the loan approval process can be even fully automated. Instead of focusing on business owners' credit history, online lending companies make decisions based on companies' current cash flows and performance (Mills and McCarthy, 2014). This information is retrieved form several different data sources (Mills and McCarthy, 2014).

The online lending companies advertise their loans for business needs like improving working capital, investing in new machines and equipment, hiring new seasonal workers, increasing storage, making marketing campaigns and expending the business (Ferratum Business, 2018; Suomen Yrityslaina Oy, 2018). Typical requirements for the borrower companies are that they must be Finnish, in the trade register and the company or the loan guarantors must not have payment defaults.

Banks have made attempts to make the loan process easier. Today services like Nordea's Yrityksen Joustoluotto or OP yrityslaina offer loan applications online. But they still require phone calls and negotiations with the bank after the submission of the application (Nordea Bank AB, 2018; OP Ryhmä, 2018). Many of the online lending companies provide much quicker and easier lending processes than banks (Lee and Shin, 2018). They tend to have smaller operating costs than the traditional service providers (Lee and Shin, 2018).

Choosing the right lending service for the borrower's financing purposes is made easier and more convenient as well. If a small business is not sure of what kind of loan would suit its needs the company can turn to multi-lender marketplace sites. These sites work similarly to the ones in the travelling industry. Loan options and prices can be compared easily like flights and hotels on these marketplaces. (Mills and McCarthy, 2014)

2.2 Current Luottorahoitus service

Luottorahoitus offers an online loan service for SME customers. Customers can apply for loans between €3,000 and €50,000 with payback periods of 1 to 12 months. Depending on the size of the loan the customer has to inform one to two loan guarantors for the applied loan.

Luottorahoitus provides a quick four-step loan process. The customer first fills in and submits the loan application. When a Luottorahoitus loan application is submitted the customer gets a granting decision within 24 hours. If the application is submitted before 4 P.M. the decision is made during the same day. If the application is approved both Luottorahoitus and the customer have to sign the contract with an electronic signature. When an approved application has been signed by both parties the money is paid to customer's bank account. The customer receives the whole approved loan amount during one banking day as a single payment. The duration of payment depends on the time and weekday the application is submitted and on the bank the customer is using.

The first invoice installment is sent for the customer after a month of the approval of the loan. The invoices for Luottorahoitus customers are sent monthly until the end of the payback period. The invoices are sent by email or by postal service depending on the payment method chosen by the client. When a Luottorahoitus invoice is sent the customer receives a text message containing the invoice information. The same applies for the payment reminder letters.

If an invoice is not paid by the due date the customer will get a payment reminder of the overdue invoice. The reminder is sent by postal service. If the invoice is not paid by the reminder due date the invoice is moved to depth collection. The depth collection of Luottorahoitus invoices is handled by an external depth collection agency.

2.3 Related services

In this section I compare Luottorahoitus to four other online lending services, Yritys-luotto.fi, Ferratum Business, Suomen yrityslaina and FIN Yritysrahoitus. I focus on the similarities and differences between these services by comparing for example the available loan amounts, payback periods and pricing. The detailed comparison can be seen in Tables 2.1 and 2.2.

Luottorahoitus and Yritysluotto.fi offer loans starting from €3,000 and Ferratum starting from €2,000 (BAF Finance Oy, 2018; Yritysluotto, 2018; Ferratum Business, 2018). Suomen yrityslaina and Siltaraha Oy promote loans starting from €1,000 (Suomen Yrityslaina Oy, 2018; Siltaraha Oy, 2018). The maximum amount that can be applied from Luottorahoitus is €50,000 (BAF Finance Oy, 2018). Suomen yrityslaina offer at maximum €25,000 (Suomen Yrityslaina Oy, 2018). Ferratum and Siltaraha then again offer bigger loans, Ferratum even up to €250,000 (Ferratum Business, 2018). None of the companies seem to mention that they would offer cheaper prices for existing customers.

	Luottorahoitus	Yritysluotto.fi	Ferratum Business
Available loans (€)	3,000 - 50,000	3,000 - 100,000	2,000 - 250,000
Payback time (months)	1-12	1-12	6-24
Pricing	Fixed delivery fee (based on the loan amount and the length of the payback period)	Fixed delivery fee (based on the loan amount and the length of the payback period)	Monthly expenses approximately 2,9 % of the applied amount + 2,5% opening fee
Guarantors	One or two guarantors (two if loan amount is 10,000 or higher)	One or two guarantors (two if loan amount is 20,000 or higher)	Guarantor required
Loan decision	Same day if application submitted on weekday before 4 P.M., else next weekday	Same day if application submitted on weekday before 4 P.M., else next weekday	During one working day
Money to bank account	0-1 banking days (depends on bank used)	1-2 banking days (depends on bank used)	Next working day after application approval
Price for €10,000 loan with 12 moths payback time	Monthly: €1,245.33; Total: €14,944.00	Monthly: €1,267.00; Total: €15,204.00	Monthly: €1,154,17; Total: €13,850.00

Table 2.1: Comparison of online lending services (BAF Finance Oy, 2018; Yritysluotto, 2018; Ferratum Business, 2018)

	Suomen yrityslaina	Siltaraha Oy
Available loans (€)	1,000 - 25,000	1,000 - 200,000
Payback time (months)	1-6 (up to 12 for old customers)	1-24
Pricing	Monthly expenses between 1.75-4.95 % of the applied amount	Fixed delivery fee
Guarantors	Guarantor required	One or two guarantors (two if loan amount is higher than 30,000)
Loan decision	Loan offer sent to customer based on application; offer sent approximately in 8 minutes	Granting decision made after application is submitted and signed by the guarantor(s)
Money to bank account	One banking day	Approximately during one banking day
Price for €10,000 loan with 12 moths payback time	Loan available only for 6 months: Monthly: €1,867.00; Total: €11,202.00	Monthly: €1,231.00; Total: €14,772.00

Table 2.2: Comparison of online lending services (Suomen Yrityslaina Oy, 2018; Siltaraha Oy, 2018)

The companies offer slightly different payback periods. The payback time of Luottorahoitus and Yritysluotto.fi can be chosen between 1-12 months (BAF Finance Oy, 2018; Yritysluotto, 2018). Suomen yrityslaina loan durations are between 1-6 months for new customers (Suomen Yrityslaina Oy, 2018). Ferratum and Siltaraha offer longer payback periods even up to 24 months because they offer larger loan amounts (Ferratum Business, 2018; Siltaraha Oy, 2018).

The pricing differs between the companies. Luottorahoitus, Yritysluotto.fi and Siltaraha offer a fixed pricing, which depends on the loan amount and the length of the payback period (BAF Finance Oy, 2018; Yritysluotto, 2018; Siltaraha Oy, 2018). Ferratum for example has monthly expenses that are calculated based on the loan amount as well as the opening fee (Ferratum Business, 2018). When comparing the price of a €10,000 loan with 12 months payback period we can see that Ferratum Business loans have the cheapest prices (total of €13,850), while Yritysluotto.fi have the highest (total of €15,204) (Ferratum Business, 2018; Yritysluotto, 2018). The price difference is even €1,354 between these providers.

Because all of the companies offer unsecured business loans, they require guarantee from one or two persons depending on the loan amount. For example Luottorahoitus requires two guarantors for a loan amount starting from €10,000. The guarantors are evaluated based on their creditworthiness.

Luottorahoitus and Yritysluotto.fi promise the borrower will get decision of the loan admission during the same business day if the loan is applied before 4 P.M. (BAF Finance Oy, 2018; Yritysluotto, 2018). Ferratum states that they will give the decision in couple of minutes after submitting an application (Ferratum Business, 2018). Even though the companies will give the decision quickly, the transition between banks can take time. This is why the companies cannot promise the money to be on the borrowers bank account earlier than one bank day (BAF Finance Oy, 2018; Ferratum Business, 2018).

All loans of compared business loans are shortened monthly. For example Suomen yrityslaina and Yritysluotto.fi inform that they send invoices monthly to their customers email or postal address (Suomen Yrityslaina Oy, 2018; Yritysluotto, 2018). Suomen yrityslaina offers an option to pay the loan back earlier and save in expenses (Suomen Yrityslaina Oy, 2018). Luottorahoitus customers currently pay the same expenses for the loans, even if they are paid back prematurely. But the company is already planning a way to encourage customers to make also early payments.

As a result of this comparison of the services I can summarize that none of the online lending companies in Finland offer services that would clearly separate them from the competitors. All of the services offer short-term unsecured loan for SMEs. They all have a rather high interest rate. All of the loans suit for companies that need financing for investments or working capital and need the money quickly and easily. The customers of the companies should be able to pay the loan back with interest quickly.

The compared loan companies do not mention much about their service processes after the customer has taken the loan. The focus is on getting the customer to apply for a loan and the services during the payback process seems to be dismissed. When

observing the US market, it can be seen that some American players offer services for their customers for loan management purposes. Examples of this kind of applications are OnDeck's web and mobile applications (*OnDeck*, 2018a; OnDeck, 2018b) and the mobile app of Kabbage Inc (Kabbage Inc., 2018b). I conduct more benchmarking of loan management applications in the chapter 4.2.

2.4 Future trends

Forecasting the future of online lending is difficult and scientific publications do not seem to take a stand to it. The industry is still small and hard to predict. In this part I introduce some predictions of the online lending business future based on mostly non-scientific sources.

Lifshitz (2017) remarks that in year 2016 some prominent FinTech companies had problems in the USA. He explains that this started to arise some scepticism about the online lending industry's direction in the future. Lifshitz predicts that despite these rough times online lending FinTechs will recover. He believes that the credit gap and demand for online short-terms loans will remain strong.

According to Vuola in Herrala (2018) there is a new upcoming megatrend ahead: traditional banks are going to team up with FinTech companies. In the USA some banks have already made partnerships with leading online lenders, like JP Morgan Chase and OnDeck as well as ING and Kabbage (Hecht, 2017). Hecht (2017) explains that the borrowers will benefit of this team up by getting the agility of online lending and the security and customer service offered by banks.

Another trend seen in the USA is that many FinTechs are starting to expand beyond their current product offering to meet multiple or even all borrowers' needs (Lifshitz, 2017; Hecht, 2017). Alongside business loans the companies can start to offer for example consumer loans, mortgages or student loans. This helps the online lenders to provide more services to their existing customers or to whole new customer segments (Lifshitz, 2017).

Small businesses are increasingly searching more financing online (Arora, 2015). Lifshitz (2017) points out that because millennials are joining the work force, the consumption of online services will increase. This applies to the financial services as well, which increases the need for these online lending services, especially through mobile devices (Lifshitz, 2017; Arora, 2015).

Instead of the price online lending services should focus on making a larger difference in the experience they are providing to their customer in the future (Mills and McCarthy, 2014; Lifshitz, 2017). Banks are still going to have the cost advantage after all (Lifshitz, 2017). Mills and McCarthy (2014) state that online lenders have to focus on the customer's user experience and overall customer satisfaction to be able to develop awareness among small businesses and make profit. Focusing on easy and effective credit application process, amount approved relative to borrower company's business opportunity and trustworthiness of the service provider are crucial to the user experience of online services (Mills and McCarthy, 2014). Offering customer support functions should be an essential part of the online lending products because

they improve the customer experience and create "stickiness" with the online lending platforms (Mills and McCarthy, 2014).

Innovations in technology continues to boost the loan approval processes. Companies are gathering large amounts of data from the borrower's business at the time of the initial application as well as after approval (Arora, 2015). Big data and artificial intelligence enables the loan providers to get to know their customers even better and provide more personalized products and experiences to them (Mills and McCarthy, 2014; Arora, 2015). They continuously learn to understand risks of lending better which enables them to make more successful loan decisions. (Arora, 2015)

These trends can give us directions to look at. But in the end customers want services that fully serve their need (Zaikovska-Daukste, 2018). We should first understand how the customers can effectively solve their tasks and how they will experience different ideas and solutions. Focusing on the user experience FinTechs can revolutionize the way people are managing their finances (Lifshitz, 2017).

Chapter 3

User experience in a B2B self-service system

In this chapter the focus is on clarifying the conceptual background for the future service. The first section introduces self-services and some advantages and disadvantages related to them. In the second part I introduce the definition for user experience and processes of designing for user experiences. In the last section of this chapter I focus on persuasive design and explain how it can be used to improve user experiences.

3.1 Self-service systems

Self-service technologies (SST) can be defined as being "interfaces that enable customers to receive a service without the direct involvement of service personnel" (Yang and Klassen, 2008). Ding et al. (2007) state that self-services are systems, which customers perform activities on behalf of the service employees.

The growth of information technology, advantages of different technologies and new kinds of business models have enabled the increasing use of SST (B. Ramaseshan and Stein, 2015). Today a range of customer service activities are provided through technology, from services over the internet to express checkout where customers scan their own items (Meuter et al., 2000; Åkesson, Edvardsson and Tornvoll, 2014). SSTs are not only provided for consumer customers, but their importance has grown in the B2B exchanges as well (Pujari, 2003).

In this thesis I focus on SSTs in the context of online services. The customers of Luottorahoitus are SMEs. However, behind every business there is one or several people making the decisions. For this reason, I feel the need to address SSTs in both consumer and B2B-context.

There are many reasons for customers to prefer self-service systems. Customers can save time and avoid contact with service personnel. (Ding et al., 2007). Because SST are not time- or place-sensitive customers can use them anywhere and at anytime (Yang and Klassen, 2008; Meuter et al., 2000). SST customers can feel like they get personal control of what they are doing (Ding et al., 2007). In some cases, customers save in costs when choosing self-service systems (Ding et al., 2007). Different customers have

different needs and desires. This is important to understand and consider to be able to offer them a combination of features that satisfy their needs (Ding et al., 2007).

Self-services over the internet give possibilities to offer personalized and customized services (Huang and Lin, 2005). Customization can increase customer satisfaction by improving the ease of use of a service and saving user's time (Ding et al., 2007). This contributes to customer retention and loyalty (Ding et al., 2007).

The key sources of satisfaction related to SST differ between consumers and B2B clients. Consumers tend to value most the ability to solve their needs easily anywhere at any time without contacting any service personnel. B2B clients value the improved speed and efficiency that the SSTs can provide. Both B2C and B2B customers find time saving as a similar source of satisfaction. B2B customers tend to highlight the cost savings as one key source of satisfaction. In B2B context clients' SST satisfaction affects the business relationships. Satisfaction correlates with the buyers' future repurchase intentions as well as behaviours like word of mouth. (Pujari, 2003)

SSTs have already had a huge impact on customer-firm interactions and continues to change the way we create service outcomes (Ding et al., 2007). Yang and Klassen (2008) emphasize that nowadays customers find that self-services offer even better service quality than traditional interaction with human service representatives. They say that companies invest in SST in order to improve their business processes and work practices. The investments help not only the firm to provide better service quality and convenience for its customers but to reduce their service costs (Yang and Klassen, 2008).

However, SSTs can cause problems and dissatisfaction both in B2C and B2B contexts too. (Meuter et al., 2000) explain that the sources for dissatisfaction can be caused for example by a technology failure. They add that technology failure can lead to customer being unable to perform desired actions because technology is not working. An example could be a problem with the server, where the software is running. Pujari (2003) points out that technology failure in B2B SSTs is the largest source of dissatisfaction and it can damage the buyer and seller relationships.

Other sources of problems that can occur when using SSTs are problems in the process, bad service designs, customer service failures or problems caused by customers themselves (Meuter et al., 2000; Pujari, 2003). Process failures for example concern problems at a step in the process (Meuter et al., 2000). For instance, a customer should receive an e-mail invoice, but he never does.

Pujari (2003) states that the companies offering SST for their clients have to be aware of the sources of problems causing dissatisfaction and try to minimize them and at the same time improve the key sources of satisfaction. The efficiency and convenience of SSTs will improve constantly. Companies are now using SST to improve their productivity and customer service. While doing this the companies should continuously track the factors that cause satisfaction and dissatisfaction, both functional and emotional, to be able to provide a satisfying customer experience. (Pujari, 2003)

In brief, self-service systems can bring a load of potential benefits for a company and its users when designed properly. The rest of this chapter focuses on designing for the self-service user experience.

3.2   Designing for User experience

The importance of user experience in online lending services was briefly discussed in Chapter 2.4. The previous section highlighted the key factors that customers value in self-service systems. To be able to design a self-service system user experience that customers will value, we have to understand how user experiences are formed.

User experience (UX) has no agreed and unique definition but there is a variety of meanings and interpretations for it. One of the most cited ones, the ISO (2010), defines UX as being "person's perceptions and responses resulting from the use and/or anticipated use of a product, system or service". According to ISO (2010) UX contains all the users' emotions, beliefs, preferences, perceptions, physical and psychological responses, behaviours and accomplishments before, during and after use of a product or service.

Nielsen-Norman Group (2018) point out the UX consists of all the aspects of interactions that the end-user has with the company and its services and products. They explain that a company offering, a service for instance, has to meet the needs of the users without causing "fuss or bother". After this we can start focusing on the elegance and simplicity of the service. Together these elements produce the joy to use. A high-quality UX requires a merging of services from multiple disciplines. (Nielsen-Norman Group, 2018)

The previous section mentioned the term customer experience (CX). CX in itself has a wider meaning than UX. CX consists of the whole company brand, product prices, service interfaces, delivery channels and social environment, for example (Verhoef et al., 2009). UX is a part of the whole CX. CX goes beyond the scope of this thesis which focus in on the designing for UX.

UX design is an innovative process that takes into account user satisfaction and factors related to usability, like effectiveness and efficiency. The user satisfaction includes emotional and aesthetic aspects of experience. A system that is designed by using human-centered methods improve UX and therefore the system quality. (ISO, 2010)

Hartson and Pyla (2012) introduce a model for especially UX design. according to their UX lifecycle model the UX design process should consist of four stages: analysis, design, implementation and evaluation. The structure of this model is very similar to the well-known process for human-centered design by ISO (2010). The first phase in the UX lifecycle, the analysis phase, is about understanding users, their work and their needs. Based on this understanding we can create conceptual designs in the design phase. The third phase in the model is the implementation phase, which is about creating prototypes based on the designs. The last phase, the evaluation, shows whether the design meets the users' actual needs. These stages should be followed in an iterative manner.

Before choosing a suitable design process to follow we want to understand more theory behind the factors that can affect the UX. Based on the article by Némery and Brangier (2014) the relationship between users and technology has gotten new forms. They state that UX can now be shaped in more emotional means though

persuasiveness. Technological media can lead the user straight to perform a target behaviour (Némery and Brangier, 2014).

In the next section I focus on the persuasive characteristics of UX. I explain the importance of persuasion and introduce how to design systems with persuasive characteristics.

3.3   Persuasive Design

Persuasive technologies have surrounded us within the last two decades (Fogg, 2009*b*). In the 1990s software technology was mainly focused on "crunching data and boosting productivity" and there were hardly any examples of persuasion (Fogg, 2009*b*). Today a large number of different technologies and services are designed to change attitudes or behaviors of their users (Oinas-Kukkonen and Harjumaa, 2009). Anyone can easily design persuasive experiences because of the easy to use persuasive products and technology channels (Fogg, 2009*a*). Reaching a large amount of audience very quickly has become easier (Némery and Brangier, 2014). This has brought persuasive technologies in our everyday lives.

Behaviours can be influenced via technology channels and interactive media everywhere and anytime. The web, smart phones, smart TVs, smart watches, car technology and video games are all doing this constantly to us. For example your Toyota Prius can motivate you to drive more eco-friendly or your pedometer can push you to be more physically active by giving voice feedback. (Fogg, 2009*b*, 2003)

3.3.1   Characteristics of persuasion

Nowadays it is just not enough to have a working system with good usability. A system needs to persuade and motivate its users to use it. Otherwise the system can remain unused. Persuasion can be used to design more effective experiences (Fogg, 2009*a*). Designers of websites and applications have understood the need for persuasive design and therefore there are many models and frameworks developed for designing persuasive systems (Némery and Brangier, 2014; Fogg, 2009*a*; Oinas-Kukkonen and Harjumaa, 2009).

Fogg (2009*a*) sees that the essence of persuasive technology is learning to automate behaviour change. When designing persuasive experiences, a guess about a solution or imitating other techniques is not enough. Fogg (2009*a*) emphasizes that it is good to understand some human psychology, especially the drivers of human behaviour before designing for persuasiveness. Fogg (2009*a*) introduces the Fogg Behavior Model (FBM) for understanding human behavior.

Based on the FBM a person performs a target behavior if the three following factors (or dimensions) come together at once: the person has to be sufficiently motivated, have the ability to perform the behaviour and be triggered to perform the behavior. These three factors, motivation, ability and trigger can vary from person to person. (Fogg, 2009*a*)

The FBM focuses on deep level understanding of the behaviour change and persuasiveness. Oinas-Kukkonen and Harjumaa (2009) introduce a higher-level framework, the Persuasive Systems Design (PSD) framework, which can be used in designing and evaluating persuasive systems. The framework includes seven postulates behind persuasive systems, analyzing persuasion context and designing of persuasive system features (Oinas-Kukkonen and Harjumaa, 2009).

According to Oinas-Kukkonen and Harjumaa (2009) the development of persuasive systems should always start with understanding the fundamental issues behind persuasive systems. Oinas-Kukkonen and Harjumaa (2009) introduces the seven postulates that have to be address in a persuasive system design process. The postulates behind Persuasive systems are following:

1. Information technology is never neutral.

2. People like their views about the world to be organized and consistent.

3. Direct and indirect routes are key persuasion strategies.

4. Persuasion is often incremental.

5. Persuasion through persuasive systems should always be open.

6. Persuasive systems should aim at unobtrusiveness.

7. Persuasive systems should aim at being both useful and easy to use.

Next phase in the PSD is to analyze the persuasion context. This requires defining the intent, event and strategy for persuasion (Oinas-Kukkonen and Harjumaa, 2009). The analysis of the context will conducted later in Chapter 4.

The third step in the PSD is to design the system qualities. The PSD model defines potential persuasive system features or principles. They divide the principles in four categories, which are primary task, dialogue support, system credibility, and social support categories. (Oinas-Kukkonen and Harjumaa, 2009)

The primary task category lists principles that support in carrying out a user's primary task when using a system (Oinas-Kukkonen and Harjumaa, 2009). Principles in the dialog category support computer-human dialogue by helping a user in moving towards his or her target behavior (Oinas-Kukkonen and Harjumaa, 2009). They can ease the user in achieving his goals. The credibility category includes principles, which can help to make a system more believable and hence more persuasive (Oinas-Kukkonen, 2013). The last category, social support, is about principles that make use of social influence to persuade users (Oinas-Kukkonen and Harjumaa, 2009). A complete list of all principles in the PSD model can be found in the Appendix A.

It is important to note that the PSD model introduces the technological possibilities for designing persuasive systems. Oinas-Kukkonen (2013) suggests however not to apply all of the design principles, when designing a persuasive system. The selection of principles should be done based on the understanding of the domain and theories (Oinas-Kukkonen, 2013). The next section introduces the relevant principles for designing the persuasive self-service system UX.

3.3.2   Selected persuasive design principles

Based on information gathered in the background literature and from the financial experts of Luottorahoitus we choose the most relevant principles from the PSD model's persuasive principles. The selected principles are expected to benefit Luottorahoitus self-service UX the most. From the primary task category (Oinas-Kukkonen and Harjumaa, 2009) we chose the four following principles:

- **Reduction** A system that reduces complex behavior into simple tasks helps users perform the target behavior, and it may increase the benefit/cost ratio of a behavior.

  Example principle: *System should reduce effort that users expend with regard to performing their target behavior.*

- **Tunneling** Using the system to guide users through a process or experience provides opportunities to persuade along the way.

  Example principle: *System should guide users in the attitude change process by providing means for action that brings them closer to the target behavior.*

- **Personalization** A system that offers personalized content or services has a greater capability for persuasion.

  Example principle: *System should offer personalized content and services for its users.*

- **Self-monitoring** A system that keeps track of one's own performance or status supports the user in achieving goals.

  Example principle: *System should provide means for users to track their performance or status.*

We chose one of these principles to be more important for the UX of Luottorahoitus self-service system, the principle of *personalization.* "Personalization enables a business to match the right product or service to the right customer, for the right price, at the right time" (Coner, 2003). Huang and Lin (2005) explain that personalization is about serving individual customers' unique needs. Personalization can include greeting users personally, giving tailored promotions or characterizing the context (Némery and Brangier, 2014). When an interface gradually collects more data about the user it can provide a higher level of personalization (Némery and Brangier, 2014).

Customers want customized services tailored to meet their own needs (Némery and Brangier, 2014). Personalization can improve customer loyalty and customer conversation ratios (Huang and Lin, 2005). For example, financial instruments such as loans can be personalized to fit customer's financial needs and preferences (Huang and Lin, 2005). This supports the decision to choose personalization as one of the most important persuasive design principles.

From the dialogue support category, (Oinas-Kukkonen and Harjumaa, 2009) we choose the following principles to focus on:

- **Praise** By offering praise, a system can make users more open to persuasion.

  Example principle: *System should use praise via words, images, symbols, or sounds as a way to provide user feedback information based on his or her behaviors.*

- **Rewards** Systems that reward target behaviors may have great persuasive powers.

  Example principle: *System should provide virtual rewards for users in order to give credit for performing the target behavior.*

- **Reminders** If a system reminds users of their target behavior, the users will more likely achieve their goals.

  Example principle: *System should remind users of their target behavior during the use of the system.*

- **Suggestion** Systems offering fitting suggestions will have greater persuasive powers.

  Example principle: *System should suggest that users carry out behaviors during the system use process.*

- **Liking** A system that is visually attractive for its users is likely to be more persuasive.

  Example principle: *System should have a look and feel that appeals to its users.*

From this category, we chose two principles that will have a greater focus in the design. The most important selected principles from this category are *liking* and *rewards*.

User experiences are shaped by emotions. According to Némery and Brangier (2014) physical attractiveness can capture the attention of users, support their interactions and create positive emotions in them. Elements such as style, animation, menus and colors are designed to maintain the interest of the user (Némery and Brangier, 2014; Rodrigues et al., 2014). They can even make the user to become more loyal to a service (Rodrigues et al., 2014).

Positive emotions can be created by offering rewards as well (Munson and Consolvo, 2012). Rewards can be used in applications for rewarding of achieving milestones or meeting goals as explained by Munson and Consolvo (2012). He says that many applications use small, visual rewards, for instance, badges or trophies. Rodrigues et al. (2014) have studied gamification and reward systems in one type of financial services, the context of electronic banking. Their study shows that gamified elements can improve customer loyalty, time spent and actions performed on an electronic banking website (Rodrigues et al., 2014).

When it comes to the credibility support category (Oinas-Kukkonen and Harjumaa, 2009), we selected two of the principles into examination:

- **Trustworthiness** A system that is viewed as trustworthy will have increased powers of persuasion.

Example principle: *System should provide information that is truthful, fair and unbiased.*

- **Surface credibility** People make initial assessments of the system credibility based on a firsthand inspection.

  Example principle: *System should have competent look and feel.*

As previously mentioned trustworthiness of the service provider is considered to be a crucial factor to the UX in online services (Mills and McCarthy, 2014). People will not use services they do not see as trustworthy. Websites should include information and elements that indicate quality and security to gain trust from the users (Némery and Brangier, 2014).

There are other important principles in the credibility support category such as *third party endorsements* and *verifiability*, that definitely affect how credible the system is seen to be. However, at this stage I will only focus on the previously mentioned credibility support principles. More of the principles can be concerned later on.

Principles in the social support category focus on social aspects of persuasion (Oinas-Kukkonen and Harjumaa, 2009). We leave these principles outside the scope of this work because many of them would require sharing private information to other people. Information regarding Luottorahoitus loan process is shared only between loan service provider and customer company. In the future some principles in the social support could however be taken into use by implementing them in an anonymous way. For example, *social comparison* could be used to present the average payment performance of certain user groups.

Chapter 4

Methods and research criteria

Hevner et al. (2004) present design-science as a problem-solving process in the Information Systems (IS) research discipline. They introduce the Information Systems Research Framework for understanding, conducting and evaluation design-science research (Hevner et al., 2004). This framework gives us a base for approaching our problem. We need to understand the environment, which consists of people, organizations and technologies as well as the business needs (Hevner et al., 2004). In our case the business needs arise from Luottorahoitus customers and the company itself. Based on this understanding we can build and evaluate a new innovative solution that meet these needs (Hevner et al., 2004). Hevner et al. (2004) call this kind of solutions artifacts. In our case the artifact is a persuasive self-service system.

In this chapter we present the methods used in the empirical research part of this thesis. We introduce a suitable design process for conceptualizing, designing and evaluating a persuasive self-service information system. This process follows the structure of the Information Systems Research Framework by Hevner et al. (2004). It focuses on understanding the business needs and designing, implementing and assessing the Luottorahoitus persuasive self-service UX as a viable business solution.

4.1 Persuasive user experience design process

Persuasive design has been applied to several contexts. A range of empirical studies have focused on topics such as better eating habits (Hsu et al., 2014; Salim et al., 2017), improving physical activity (Harjumaa et al., 2009; Karppinen et al., 2016; Bartlett et al., 2017) and making other health related behaviour changes (Segerståhl and Oinas-Kukkonen, 2007). Persuasive design has been applied to the tourism and travel industry (Kim and Fesenmaier, 2008; Loda, 2011; Lee and Gretzel, 2012; Pourabedin and Nourizadeh, 2013) and other contexts such as aiming for better sustainability (Nyström, 2017) and persuasive education (Orji et al., 2018). However, it seems that persuasive design has not been studied in the context of B2B financing.

In Chapter 3 we introduced the PSD model by Oinas-Kukkonen and Harjumaa (2009), which can be used to design and evaluate persuasive systems. This model has been utilized in design, development and evaluation phases of several studies (Karp-

pinen et al., 2016; Davis, 2010; Harjumaa et al., 2009; Purpura et al., 2011; Lehto and Oinas-Kukkonen, 2009, 2010). In their model Oinas-Kukkonen and Harjumaa (2009) introduce three generic steps for persuasive system development, which are following: analysis of persuasion context and selection of persuasive design principles, requirement definition for system qualities and system implementation. A software designed this way can cause attitude or behaviour change in use (Oinas-Kukkonen and Harjumaa, 2009).

In addition, we introduced the UX lifecycle model by Hartson and Pyla (2012) in Chapter 3. The stages of this model are analysis, design, implementation and evaluation (Hartson and Pyla, 2012). Both the UX lifecycle and the PSD model suit well for design science research because they describe processes for creating new solutions that aim to meet user and business needs. Because we are designing a persuasive UX we want to make use of both of these models.

Moreover Google Ventures (2010) and Plattner (2010) introduce valuable practices for understanding users and being innovative, namely Design Sprint Kit framework and Design Thinking approach. Both Design Sprint Kit and Design Thinking follow a roughly similar workflow as the UX lifecycle model (Google Ventures, 2010; Hartson and Pyla, 2012).

By taking the best out of each above-mentioned models and approaches we introduce a design process for the empirical part of this thesis. We follow the iterative design work flow described in the Figure 4.1. The process is a combination of the UX lifecycle model by Hartson and Pyla (2012) and the PSD model by Oinas-Kukkonen and Harjumaa (2009). We will make use of practices introduced in Design Sprint Kit and Design Thinking Google Ventures (2010); Plattner (2010). This process model tries to partly answer the first research question: "What kind of design process and methods can be used to design a persuasive user experience for a B2B self-service system?". The methods that we are going to use are introduced in the next sections.

Iteration can be seen as "a fundamental of good design" (Plattner, 2010). In this thesis we conduct two iterations of the above introduced design process. The same process can and should be used during the later iterations of the development cycle. In the next sections we introduce each of the stages of the process in more depth.

4.2 Analysis of environment and business needs

Our design process starts with the analysis phase. The idea of the analysis phase is to understand the environment and the business needs for this IS research. The analysis covers the literature reviews in the chapters 2 and 3 and the modelling of the self-service system in chapter 5.

In chapter 5 we first conduct benchmarking of self-service loan management systems. The idea of benchmarking is to compare a product or service with its "peers" (Daniels, 1996). Benchmarking is usually most beneficial when it is done with globally selected organizations (Daniels, 1996). We use benchmarking to explore whether there are similar kind of self-service solutions available by any provider and what are the possible best practices of these solutions.
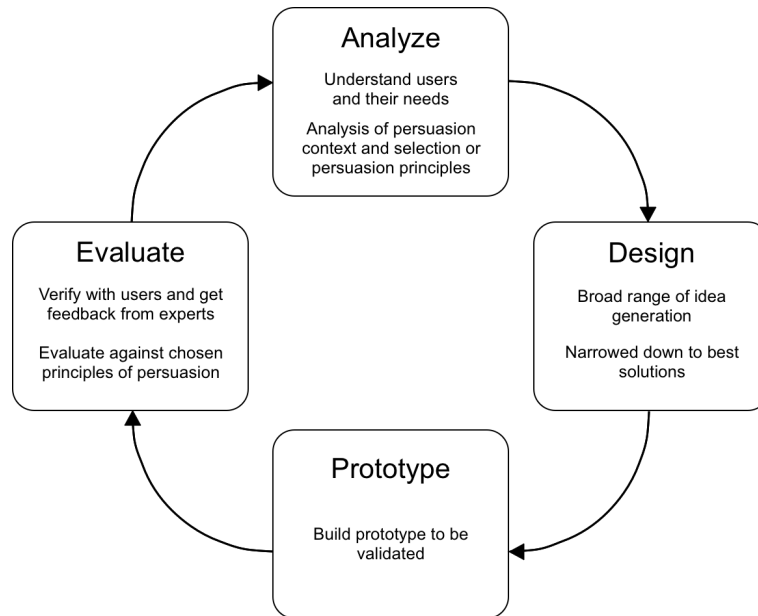
Figure 4.1: Iterative process for persuasive UX design, adapted from Hartson and Pyla (2012) and Oinas-Kukkonen and Harjumaa (2009).

Next, we start defining Luottorahoitus users and their needs. For modelling users, we use personas, which are created based on the main user groups of the service. Personas are fictional representations of real users (Norman, 2004). They are used to help designers to understand and establish empathy of the people they are designing for (Norman, 2004). We choose to use personas because they can help in answering questions like who will use the future service and how it will be used (Pruitt and Grudin, 2003). Personas are often used as a discussion tool among designers, developers and other stakeholders (Pruitt and Grudin, 2003). Hence personas can benefit Luottorahoitus in the future iterations of the self-service system development and in other projects.

Quantitative data is often needed for creating personas (Pruitt and Grudin, 2003). Before creating personas, we gather and analyze quantitative data about Luottorahoitus users. During the first iteration of our design process we construct the initial versions of the personas based on the collected data and knowledge of the business context studied in the Chapter 2 as well as from Luottorahoitus experts. A persona can consists of aspects like gender, age, job, race, ethic, family, socioeconomic background and free-time (Pruitt and Grudin, 2003). During the second iteration we refine our initial personas based on information gathered from interviews and testing with the users presented in Chapter 7.1.

After creating personas we write scenarios. Scenarios are examples of the use of a system in a real use context (Maguire, 2001). They are useful for understanding user requirements (Maguire, 2001). We use scenarios for understanding what kind of content we should have in the system and what kind of structure the system could

have. Scenarios are useful later on in our evaluation phase too. They give a good basis for user testing (Maguire, 2001).

The literature reviews of the business context in Chapter 2 and about the self-service system UX in Chapter 3 give us a starting point for answering our second research question: "Who are the users of the future B2B self-service system and how can the design meet their need?". Gathering of quantitative customer data and creating personas and scenarios in the analysis phase are suitable methods for investigating our second research question more specifically.

Moreover, this phase contains the analysis of the persuasion context and the selection of the persuasive design principles as suggested in the model by Oinas-Kukkonen and Harjumaa (2009). The selected principles are listed in the Chapter 3.

In the end of the analysis stage we define a set of requirements for the system. The functional requirements are defined based on the most common tasks that the users would perform with the service. In the evaluation phase we test whether these requirements meet the users' needs and support their processes. The second iteration refines the requirements from the first iteration based on user feedback and adds the persuasive system requirements to the set.

4.3   Design and prototyping

The second step in our design process is the design phase. By taking the initial requirements into account we ideate and discover different design solutions as proposed by Design Thinking (Plattner, 2010). According to Rudd et al. (1996) the first solutions should be designed based on the most frequent tasks user would use the system for. We start with discovering alternative interface layouts by sketching solutions. The idea is to first generate a broad range of ideas. This helps us to get more innovative (Plattner, 2010). The ideas will be then narrowed down to the 2 best solutions taken to the next stage.

After the design phase we move on to prototype implementation. ISO (2010) defines a prototype as a "representation of all or part of an interactive system, that, although limited in some way, can be used for analysis, design and evaluation". At the beginning the prototypes should be quick and cheap to make (Hartson and Pyla, 2012; Rudd et al., 1996). By focusing on the essential parts we can get authentic feedback in our evaluation phase avoid going to one direction too early (Google Ventures, 2010; Plattner, 2010). In the beginning of a design process it is recommended to bring several ideas into the prototyping phase (Plattner, 2010; Google Ventures, 2010). We implement our designs as two lower fidelity black and white interactive prototypes with the most important functionalities and elements of the service.

In the second iteration we go through the design and prototyping phases again. The second iteration design phase consists of ideating the persuasive features for the system. Fogg (2009*b*) suggest that design teams should find examples of successful use of persuasive technologies that work for similar kind of user groups as the designed service. After this he suggests imitating the features that are working in these examples. He emphasizes that imitating similar solutions is the surest way to build successful

persuasive technologies quickly. During later iterations the persuasive features will become unique for the service (Fogg, 2009*b*).

We start by searching for different persuasive design solutions and discussing about them with the company experts. We explore solutions that try to achieve same kind of behavior, have a similar kind of audience and uses the same technology as our solution as Fogg (2009*b*) suggests. We generate ideas for persuading Luottorahoitus users based on the selected persuasive design principles and sketch different versions of applying them to the current designs. In the end of the design phase the best ideas for persuasion are chosen.

In the second iteration we merge the two prototypes from first iteration together by selecting the best elements of each one. The selection of the elements is done based on feedback from the users. On the second iteration we include the persuasive features to the design. The persuasive principles, personalization, rewards and liking, selected in chapter 3 require a higher-fidelity prototype. For example, a prototype designed for *liking* and rewards requires a visually appealing interface design with a planned reward system. This is why we choose not to include them during the first iteration. The prototype of the second iteration includes most of the required functionalities and has the look and feel close to the final product.

4.4 Evaluation

The last phase in our design process is the evaluation. This part focuses on answering the third research question: "How to evaluate persuasive user experience of a self-service system?".

Several studies have evaluated the persuasion of systems with real users and working products (Karppinen et al., 2016; Kaptein and van Halteren, 2012; Harjumaa et al., 2009). The study of persuasive user experience of health behavior change support system by Karppinen et al. (2016) included 42 users and lasted for 12 months. A case study by Kaptein and van Halteren (2012) related to persuasive message reminders had 1129 users participating for 30 days. The study by Chang et al. (2012) was conducted as a two weeks online survey with 68 participants.

Evaluation of persuasive systems aiming for behavior change can be challenging. It often requires a fully working prototype and is time consuming. (Kientz et al., 2010) Fogg (2009*b*) criticizes the time consuming approaches and states that evaluating of persuasive solutions should be done quickly and iteratively. He suggests conducting quick lightweight testing lasting for only some hours to understand how the users react and ideally evaluate their behavior.

In addition to testing with users an expert evaluation can be used to evaluate persuasive systems. Many studies have performed evaluation of persuasive features with one to several experts using different principles and heuristics for conducting evaluation (Harjumaa, 2014; Kientz et al., 2010; Némery and Brangier, 2014; de Jong et al., 2014; Sutcliffe, 2002). In the study by Harjumaa (2014) the interface is tested against the PSD principles Oinas-Kukkonen and Harjumaa (2009). The study by Némery and Brangier (2014) user interfaces (UI) were evaluated based on the eight

interactive persuasive criteria by Némery and Brangier (2014) and Kientz et al. (2010) have developed a 10 set heuristic based on Nielsen's 10 heuristics especially for evaluating persuasion, adoption and effectiveness of these technologies.

Testing solutions with real users early on and during the design process is highly recommended (Plattner, 2010; Google Ventures, 2010). Testing should empathize learning more about the users and the potential solution (Plattner, 2010). In addition to testing interviewing is typically used to get a better understanding of the users and their needs (Jumisko-Pyykkö et al., 2008; Hildén et al., 2016). Davis (2010) conducted interviews during her persuasive design process for gaining understanding or factors like users' goals, hopes and concerns.

Before focusing on evaluating the actual persuasive features we conduct user interviews and testing in the first iteration. The interviews with users give us more insights into user's work life, technology usage, use of persuasive applications as well as their experience of the current Luottorahoitus services. User testing give us an understanding on how well the designs and the main content respond to users' needs and how the content should be organized.

Tohidi et al. (2006) suggests to test more than one prototype in the beginning of the design process. When the users see different versions of the designs the can be more open for giving objective and critical feedback (Tohidi et al., 2006). According to Nielsen (1994) and Google Ventures (2010) validation of the prototypes should be done with at least five users to get valuable feedback.

We test the first iteration prototypes with five users using thinking aloud method. Nielsen (2012) explains that in this method the users are advised to tell their thoughts aloud and explain what they do while they use an interface. Users will be asked to think aloud while performing tasks addressed to them.

Hevner et al. (2004) emphasizes that we need evaluation criteria against which we can test an artifact's performance. Our evaluation criteria is be based on the requirements defined after the analysis phase. We use different evaluation criteria in the two iterations. The **evaluation criteria for the first iteration** are:

- Interest to use

- Navigation and layout

- Content

The first evaluation criterion is user's interest to use the service. We want to know whether the users need or want to use this kind of service and why or why not. This helps us in understanding the real need for this kind of system and the need for persuasion.

The second evaluation criterion is the navigation and layout of the prototypes. We evaluate, which one of the prototypes and what elements the user finds better, easier or more intuitive for achieving their objectives. This criterion is related to the selected navigation, UI elements and their placing. This helps us to construct the second iteration prototype as a combination of the best elements from both prototypes.

The third evaluation criterion is the content of the service. With these criteria we asses whether the prototype have the required functionalities for performing the selected tasks and whether there is something unnecessary.

In the second iteration we evaluate the system against the chosen persuasive design principles. We choose to conduct expert evaluations against the PSD principles evaluating the presence of the principles using a rating scale as in studies of Lehto and Oinas-Kukkonen (2010) and Sutcliffe (2002). Expert evaluation is chosen because it is time-efficient and because we do not have a functional front-end or back-end that would enable the testing of the system with real users. The **evaluation criterion for the second iteration** is:

- Presence of selected persuasive principles in the system

Evaluating the presence of the persuasive principles gives us an understanding of which ones of the selected principles have the largest effect on the behavior changes the system aims for. In addition, we can understand which principles have been exploited successfully in the design and which ones need to be paid more attention to.

Chapter 5

Modelling of self-service system

This chapter focuses on modelling the Luottorahoitus self-service system based on the findings in chapters 2 and 3. I first do benchmarking of the currently available online loan management self-service systems. Next, I start modelling the users and their needs based on user data. After this I create initial scenarios. This is followed by the persuasion context analysis and selection of the persuasion principles for the system user experience. Based on the gathered knowledge I finally propose initial requirements for the Luottorahoitus self-service system user experience.

5.1 Benchmarking of loan management systems

In Chapter 2 I conducted a competitor analysis in the business context. I analyzed online lending companies similar to Luottorahoitus. In this part I do benchmarking of self-service systems in related to managing online loans.

Because the American players have been forerunners in the online loan industry we start by taking a look at them. The online lending service OnDeck offers an application for managing OnDeck accounts for their business customers. They provide features like viewing loan statuses, balance and available funds. Their users can make payments, check transaction statuses and contact account managers easily with this app. They can also access their account using TouchID. (OnDeck, 2018b; OnDeck Capital, 2018)

Kabbage Inc. has a similar kind of application for their users (Kabbage Inc., 2018b). The users can manage their payments and accounts on move. The app enables the user to apply for more capital and informs instantly the amount of money the user can be granted. They promote that the funds can be withdrawn right from users' phone. Biz2Credit (2018b) has also an application for its small business lending marketplace, but the application does not offer loan managing functions.

Finnish business online lending companies do not seem to offer applications for managing company's loans. However, this kind of applications can be found on the consumer side in Finland. For example, DFC Nordic Oy (2018) offers a mobile application for consumer loan customers, which helps the user manages their loans. The users are able to see information of all their loans, widthdraw money to their account and pay the loans back with the application (DFC Nordic Oy, 2018). The

mobile app log in is done with username and password (DFC Nordic Oy, 2018) so no bank identification is needed.

There are a large amount of applications meant for managing any loans. These applications are provided external developers. This kind of application typically offer features like loan calculators, managing multiple different kinds of loans, making payment schedules, tracking loan process, getting notification about payments and making payments (Rybin, 2018; InbuiltAI.com, 2017). The downside of these applications is that the user has to do quite much work by themselves when using them. Information is not fed automatically to these systems as in the services provided by the loan providers. This kind of applications usually either contain ads or the user has to pay for them.

5.2 Modelling users and persuasion context

Next, I will start gathering understanding about Luottorahoitus users. This section focuses on modelling the users by gathering user data, creating personas and scenarios as well as modelling the persuasion context for the future self-service application.

5.2.1 Collecting user data

In this phase I collect quantitative information about Luottorahoitus current customer companies and borrowers. In our case the borrower is the first guarantor of the loan and the policy-maker in the company. This anonymous customer data was collected from Luottorahoitus current service's database. The data is presented in the Appendix B.

I collected information related to policy maker's gender, age group and position in the company. I gathered data regarding the company's corporate form, industry and home city. In addition, I collected information about customer's devices used and their reasons to contact Luottorahoitus customer service. These data attributes were selected because they can give us a base for understanding the most important user groups.

The gender distribution of Luottorahoitus customer's policy-makers was roughly one third of women (36 %) and two thirds of men (64 %). The average female customers' age was 44 years and male customers' 43 years. The largest segment in both gender groups is the age segment of 35-39 years. Nearly one fifth of all customers belong to this age group. About 80% of both male and female customers' age is in the thirty years range between ages 30-59. This indicates that the age range starts from young working adults, has its peak in between ages 35-39 and decreases slowly when approaching the pension age groups.

Policy maker's position in the company typically felt into three main categories. The two largest categories are the company owners with 36.4% and managing directors with 35% of the policymakers. Women are classified more often as the owners of the company whereas men are categorized as managing directors. The third largest

segment are the entrepreneurs with 17.2% of all policymakers. Only 11.4% of the customers were classified to have some other position in the company.

Roughly 60% of the customer companies are entrepreneurs working under a trade name. The rest, about 40% of the customer companies are limited companies (suom. "Oy") meaning they are smaller or larger firms with one or several employers.

Saving of the data regarding customer company's industry is just recently added to Luottorahoitus system. This is why we have only a quite small sample of this information. The industries are classified based on the TOL by Tilastokeskus (2008). According to the sample data the most common industry for the borrower companies is construction (26.5%), other service activities (20.6%), agriculture, forestry and fisheries (17.6%) and human health and social work activities (11.8%). However, this is only a small sample size, it does not necessarily respond to reality. I am showing this data to give an insight of what kind of industries the companies could be working on.

The purpose for which the loans were applied were divided into six categories. One third of the loans were applied for working capital, 28% for investments and 23% for urgent purchases. One tenth of loans were planned to be used to growth financing. The remaining 5% were applied for marketing (3%) and other purposes (2%).

The data regarding the companies' home cities indicates that the majority of Luottorahoitus customers come from the Southern, Southwestern and Western Finland. Only a few customer companies are located outside these regions of Finland. Helsinki capital region has the largest concentration of Luottorahoitus customers.

We collected two data sets concerning the device usage of customers. The first set of data shows device that was used to enter the loan application and the second set the device with which the application was submitted. The data shows that 73% of the entries to Luottorahoitus loan application page are made on mobile devices, 21.5% with desktops and only 5.3% with tablets. When it comes to submitting the loan application, the users tend to prefer desktops to mobile devices. Over half (52.7%) of the applications are submitted using a desktop device but still a large minority using mobile (43.8%). Tablets are used to submit the loan application only by 3.5% percent of the users.

The above information is collected from the data customers provide in their loan applications. Besides this Luottorahoitus continuously learns more about its customers during contract periods. For example, customer's payment behaviour is something that is monitored throughout the whole customership. Luottorahoitus does not want to publish information regarding their customers' payment behavior data. Nevertheless, payment behaviour is something that affects the design of the self-service.

In addition, I collected information about the reasons customers typically contact customer service. Customers can contact Luottorahoitus customer service through email and phone. Information regarding each contacting event is recorded in the Luottorahoitus system as a note by the service personnel. I went through these notes and marked down the main reason for each contacting event. All reasons except issues related to dept collection were marked out. The depth collection is out of the scope for this system because it is handled by an external provider. The different reasons for contacting customer service are categorized and listed in Table 5.1. Each contact

Reason No.	Reason for contacting	% of contacts
1	Postpone invoice due date	24,4
2	Current loan status (open, paid, costs)	16,8
3	Questions about invoice instalments	13,4
4	Requesting balance certificate	10,9
5	Changes to billing address	8,4
6	Change invoicing type	7,6
7	Invoice copies	5,0
8	Paying loan back in advance	4,2
9	Payment reminder copies	3,4
10	Possibility for applying for a new loan	3,4
11	Changes to company's basic information	2,5

Table 5.1: Reasons for customers contacting customer service

event is categorized under one of the topics in the table.

The most common reason for contacting the service personnel is customer's need or want to postpone the due date of one or several invoices. Approximately one fourth of the contacts were due to this reason. The postponing request is approved or rejected by customer service and the changes are made to the system.

The second and third most common reason were related to status of customers' loans and invoices. Most typically customers wanted to know what the remaining loan amount is to be paid or how many invoices are currently open. Sometimes they tend to ask how many invoices are paid. Some contacts were related to pay dates, for example when will the next invoice be due.

Customers contact customer service regularly for requesting balance certificates. Customers need these certificates usually for the yearly financial statements. The certificate is generated as a PDF file and sent to the customer by email.

Some reasons for contacting are related to requesting changes to current billing information. Customers contact because their postal address has changed, or they want to get their invoices to a different email address. They contact because they want to change from email to postal invoicing or to start using e-invoicing instead of default billing method.

In addition some contacts are related to asking for copies from invoices or payment remainders. These invoices and remainders are already sent to customers earlier, but they need a new copy of them. Customers might have lost the invoice, or the invoice have not reached them for some reason.

Sometimes customers contact with issues related to paying the loan back in advance and possibility for applying for a new loan after or alongside current loans. Currently there is not a option to pay the Luottorahoitus loan back prematurely. This means customers will receive the same expenses regardless of whether they pay the whole loan back several months earlier or on the due date of the invoice. When customer is interested about a new loan they will be advised to send a new loan application if

their payment situation allows it.

In rare cases customers contact because they want to get their company's basic information changed. For instance, the company can be renamed and ask for a name change.

5.2.2 Creation of personas and scenarios

I collected information related to the business context and quantitative data about Luottorahoitus customers as well as interviewed Luottorahoitus customers as described in Chapter 7. Based on this data and insights from the Luottorahoitus experts we created three main user groups and three personas representing each of them.

When going through the quantitative data I did not see any clear differentiation that would separate the users into different user groups. After this I went through information related to the business literature in Chapter 2 and talked with company experts to get even more insights to the users to be able to find out the user groups.

Based on the insights from Luottorahoitus I decided to construct the main user groups based on customers' payment behaviour. The reason for this was that payment behavior is the main difference that separates the needs, attitudes and goals of the users when thinking of the self-service system usage. The first user group contains customers with good payment behaviour, the second users with varying payment behavior and the third users with poor payment behavior.

After constructing the user groups, I created the three personas. When creating the personas, I took into account other differences between the users based on our quantitative and qualitative data, for example age and gender, job and position in company, the use of computer and mobile applications, the use of persuasive applications, user's attitudes and values and the need for possible new loans in the future. First versions of the personas were created during the first iteration and they were refined in the second iteration. The personas 1, 2 and 3 are represented in Appendix C.

Persona 1 represents the users with good payment behaviour and he is called Esa. Esa is 55-year old married father of 2 children. He is a managing director of a three-person construction company that builds houses and he has a long career in the industry. Esa acts as the leader of the company's projects. He works daily in the construction site and in the evenings at his home office. At home Esa's wife sometimes takes care of the company's paper work. Esa needs money for investing in new machines and he aims in growing his company steadily. He is very precise by his nature and wants to offer his own customers good quality service but also expects it from other service providers. He always takes care of paying his bills in time. Esa uses smart phone a lot because he has to take care of work on the go. He does prefer web application compared to mobile applications because his phone memory is small.

When designing for users like Esa we want to reward the users of their good payment behavior constantly by giving them discounts from invoices and make him a loyal customer by offering him new loans with discounts. Users like Esa also tend to prefer web applications so there is need for it in addition to the mobile application.

The application will help Esa especially when he needs to take care of his loan related issues outside the working hours.

Persona 2 represents the user group with varying payment behavior. She is called Anne and she is a 38-year old. Anne is opening up a hairdresser salon on her own under a trade name and she needs financing for it. Anne uses her smart phone and computer daily to work purposes as well as to reading blogs, messaging her friends and tracking her eating-habits. Anne prefers mobile apps to web apps when using her phone. Seasonal changes make it sometimes hard to take care of her financial issues even though she is trying to. Anne values visually beautiful interfaces and sometimes makes us of discounts if available.

Design implications for users like Anne include making the application look smooth and aesthetically appealing and available as a mobile application. Users with varying payment behavior can be encouraged to pay by offering them promotions or rewards. We have to ensure that this kind of users do not develop a habit of paying late. This can be done by setting a small penalty for late payments. For users like Anna need also the opportunity to pay invoices later if really needed by postponing invoice due dates.

Persona 3 is called Ville and he is a user with poor payment behavior. Ville is a 30-years old entrepreneur who imports coffee products. Ville's salary and working times depend on the transporting schedules. He needs financing for paying the seller companies in advance before getting payments from his buyers. Ville often has challenges with having enough working capital. This affects his ability to pay his bills in time. He does his business on the go and has his smart phone constantly in use. He usually has a lot going on with his businesses and needs to be reminded of things. Ville prefers mobile applications because they enable notifications, but he is often sceptic about security issues and amount of information that is collected though these applications.

When designing for users with poor payment behavior such as Ville we need to provide options for them in different situations. We need to remind them of the invoices constantly to ensure that the bad payment behavior is not due to forgetting to pay invoices. Also, we have to inform them about the actions that will be made if the users do not pay their invoices after due date and after payment reminders.

After constructing the personas, I created scenarios for each persona. The scenarios represent the most important use cases for the self-service system. They describe the users' motivations to come to and use the system. The scenarios for the system are:

- **Skenario 1:** Esa has a €5000 Luottorahoitus loan that he took several months ago for fixing his forklift and buying construction material. Esa has paid several invoice instalments but has lost track of how much and how many instalments he has left. Esa once called Luottorahoitus customer service and they suggested that he could download the new mobile application to easier access information related to his loan. Esa remembers that and downloads the app and logs in in the hope of getting the information from there.

- **Skenario 2:** Ville has a Luottorahoitus loan too and he has downloaded the mobile app that was advertised to him after the loan approval. Ville has his

business up and running but one of his customers has not been able to pay him a large instalment in time. The customer informed Ville they could pay it after 3 weeks. The due date of Ville's next Luottorahoitus invoice is tomorrow and he is not able to pay the invoice in time. Ville logs into the Luottorahoitus web application to check if he can do anything for getting more time to pay.

- **Skenario 3:** Esa is working in the evening at his home office and finds a paper invoice on his table. Esa is not sure of whether the invoice is paid or not because sometimes his wife often takes care of his payments. Esa remembers that maybe he can check the invoice payment status from the Luottorahoitus web application.

- **Skenario 4:** Anne's bookkeeper calls her and asks her to send a balance certificate related to her loan. Anne is currently sitting in the bus and notes that she could check whether the certificate could be accessible thought the Luottorahoitus mobile application.

- **Skenario 5:** Anne has almost paid her whole loan back and is wondering whether she could get a new loan from Luottorahoitus. She needs to hire a seasonal worker for the autumn. Anne thinks the new loan should be cheaper because she is an old customer and has paid her invoices always in time. She signs in to the Luottorahoitus application to check if she could apply for a new loan and what the terms for that would be.

- **Skenario 6:** Ville has had problems in paying back Luottorahoitus bills during the summer holidays because his business has not been booming. He has gotten a payment reminder notification email and is worried about how he should act if he cannot pay the bills either before the due date of the payment reminder. He opens the app to see if there is any information about the situation.

5.2.3 Persuasion context

The design and development process of persuasive systems introduced by Oinas-Kukkonen and Harjumaa (2009) consist of three steps. The first step was introduced in chapter 3.3.1. It highlighted the fundamental issues that have to be understood before designing a persuasive system.

The next step in the PSD process is to analyze the persuasion context. This means understanding intent of persuasion, persuasion event and persuasion strategies in use. This analysis can help us to understand inconsistencies in users thinking and recognize when is the right time for persuasion. The analysis step give a base for effective persuasion. (Oinas-Kukkonen and Harjumaa, 2009)

Determining the intent is about understanding who the persuader is, in other words who has the need to affect one's attitude or behavior (Oinas-Kukkonen and Harjumaa, 2009). According to Oinas-Kukkonen and Harjumaa (2009) persuader is the ones who "create, distribute, or adopt the technology". Fogg (1998) presents three types of intent: endogenous, exogenous and autogenous. He explains that endogenous intent comes from the ones who create or produce the interactive technology. Exogenous intent is caused by external factors and it comes from the ones who give access or

distribute the interactive technology (Fogg, 1998). Autogenous intent is produced self by the adopter of the interactive technology (Fogg, 1998).

In our case Luottorahoitus is the producer of the persuasive technology. Luottorahoitus can persuade the user to take the system into use and thereafter persuade them to perform activities on behalf of the service personnel. Therefore, Luottorahoitus is the source for an endogenous intent. The system will be autogenous as well, because it will be designed to influence user's own attitudes and behaviours. A user can for example take the system into use because it persuades him to pay his invoices in time.

Oinas-Kukkonen and Harjumaa (2009) states that it is important to recognize the change type, meaning whether the persuasion tries to change user's attitudes or behaviours. The aims of using persuasion in the self-service system are to get users to perform their task rather by using the application than by contacting service personnel and to get the user to apply for new Luottorahoitus loans and become more loyal to the service. One aim of the persuasion can be affecting customer's payment behaviour in a positive way. Based on the aims the change type for the persuasion is behavior change.

Determining the persuasion event requires understanding of the use context, user context and technology context (Oinas-Kukkonen and Harjumaa, 2009). In case of the self-service system the use context is related to the loan management domain. Customers want frequently to know their current loan, invoicing and payment statuses because they are not certain about them. Customers have information available through contracts and received invoices. But many customers tend to lose track of what they have already paid or how many instalments are still upcoming. One intent is to help customers to keep track of their contract and invoice statuses and perform most of the loan management activities independently by themselves.

In addition, people know that invoices should be paid in time but for different reasons some customers are not doing it. Oinas-Kukkonen and Harjumaa (2009) points out that in many cases users have the required information to act but they have inappropriate behaviours that prevent them from acting as they should. This kind of behaviours can be formed over a longer time period. A persuasive system should be designed to help the user to change their attitude towards a proper behaviour, which in our case is encouraging to a better payment behaviour. (Oinas-Kukkonen and Harjumaa, 2009)

The user context refers to individual user's characteristics, for example user's interests, needs, goals, motivations and abilities (Oinas-Kukkonen and Harjumaa, 2009). The system brings the information related to user's loans available for the user easily anywhere and anytime. By using the system, the user can get motivated in paying invoices in advance and get new personalized loan offers that respond to their interests.

The technology context is related to the technology that will be used. The system will be developed as a mobile and responsive web application accessible on mobile and desktop with any browser. The application handles all the requests and changes made by the user so that service personnel will be freed from these activities.

When analyzing the persuasion strategy there are two important features to be taken in into account: the message and the route (Oinas-Kukkonen and Harjumaa,

2009). The message in our case is to improve the user experience perceived by the user and therefore improve customer loyalty. The route is to provide an easy way to for customers to manage their loans and give them new personalized loan offers.

The last step of the persuasive design process is to design system qualities. In the next section the focus is on defining the requirements for the self-service system.

5.3 Requirements for evaluation criteria for Luottorahoitus self-service system UX

In this section I introduce the requirements for the first and second iteration prototype. In the first iteration we focused on the most important functional and non-functional requirements. After the first iteration I refined the requirements and defined the persuasive requirements for the future service.

The most important functional requirements aroused from users' needs. Previously in this chapter I discussed the reasons for customers usually contacting the customer service (Table 5.1) and created scenarios for the typical use cases for the system. Based on the frequency of the customer contacts and the scenarios we constructed a list of initial functional requirements for the system.

The **functional requirements for the system in the first iteration** are following:

- The overview of loan

- The overview of open, late, paid and upcoming invoices

- The detailed invoice and payment reminder information and copies

- Postponing of an invoice due date

- Downloading of the balance certificate

On the second iteration I added the remaining functional requirements to the design based on the customer contact list and feedback from user tests. The **added functional requirements in the second iteration** are following:

- Applying for a new loan

- The new loan offers

- The profile and billing information and editing possibilities

- The recently asked questions

- The invoice payment view

In addition to the functional requirements we had non-functional requirements arising from the user needs and from the seven postulates behind persuasive systems introduced by Oinas-Kukkonen and Harjumaa (2009). The postulates cover a range of aspects that must be paid attention to in a persuasive system design process. These aspects include for example responsiveness, convenience, ease of access

and ease of use, positive user experience, attractiveness, simplicity, user loyalty and error-freeness (Oinas-Kukkonen and Harjumaa, 2009).

The non-functional requirements for the system are following:

- Mobile first; responsive

- Intuitive and easy to use

- Persuasive user experience (addressed in second iteration)

- Match with Luottorahoitus brand and themes (addressed in second iteration)

Besides the above-mentioned requirements I needed to define precise persuasive system behavior and qualities for the self-service system. In the previous chapter we selected the PSD principles for the self-service system UX together with Luottorahoitus company experts. Three principles were selected to be the most important in the design: personalization, liking and rewards. The main focus of the persuasive design is on these principles. Other principles that are considered in the design are reduction, tunneling, self-monitoring, praise, reminders, suggestion, trustworthiness and surface credibility.

In the design part of the second iteration we ideated persuasive features with company experts based on the selected principles. The features aim to persuade the user to use the system, to pay his or her invoices back in time and to take a new loan and become a loyal customer. Table 5.2 presents the principles and how they are planned to be implemented in the system.

Principle	Implementation
Liking	Attractive look and feel and animations to provide feedback.
Rewards	Reward users with good payment behavior by giving discounts from upcoming invoices.
Personalization	Personalized new loan offers, greetings, suggestions and congratulations.
Reduction	Remind users constantly about their invoice and payment statuses and actions they can take. Reduce users' effort to keep on track of invoices and figure out options in different situations.
Self-monitoring	Following the current loan status and own payment behavior.
Reminders	Remind of invoices and upcoming due dates as well as paying progress.
Tunneling	Guide user through the whole loan pay back process.
Praise	Using praise via words and images in reminders and suggestions for the user.
Suggestions	Suggestions for actions such as postponing invoice due date and taking a new loan.
Trustworthiness	Clearly represent all information for the user to avoid uncertainty. Inform user about information that is collected and the purposes. Inform about privacy issues. Making payments through trustworthy channels.
Surface credibility	Competent look and feel. No advertisements.

Table 5.2: Persuasive principles and their planned implementation in the self-service system prototype

Chapter 6

Design and implementation

This chapter covers the design and prototype implementation phases in both first and second iteration of creating the persuasive self-service system prototype. I describe the idea generation phase as well as the realization of the ideas into prototypes. As a result of these phases I introduce both the first and second iterations prototypes.

6.1 Idea generation

I started our design phase on the first iteration by sketching different layout ideas for the system. These ideas were based on our initial understanding of the users' needs and the business context. In the sketches I ideated ways to achieve the first iteration requirements defined in chapter 4.

I did sketching by drawing different kind of ideas using a pen and paper. The sketches had differences in navigation, structuring, positioning and UI elements. Sketching helped me to understand, which functions and elements could be grouped together and how I could bring the most important tasks easier at hand for the users.

I came up with several different navigation types, from which I selected the two most clear but varying ones. Both of these designs had the following navigation categories: loans, invoices, postponing of invoice due date, downloading of a balance certificate, customer profile and loan offers. I drew different versions of loan and invoices views and of postponing invoice due date view. These pages had different kind of inner navigation and type of UI elements. The most interesting but different structures and elements were selected to be taken into the prototype building phase.

The design phase of the second iteration started with sketching again. Based on the user feedback I combined the best elements and navigation flows of the first iteration designs. We had previously defined the persuasive requirements for the system together with the company experts. Now I started to ideate how these features could be added to the refined design using sketching. Again, I made different versions of visualizing the persuasive features first on paper. In the end the most promising and clear ideas were taken into the prototyping phase of the second iteration.

6.2 Realizing the design solution

In both iterations I selected the best ideas to be brought to the prototype building phase. I implemented the prototypes using Sketch and InVision as design tools (Bohemian Coding, 2018; InVisionApp Inc., 2018). These tools were chosen because I thought they would work well for implementing both the first and second iteration prototypes and I was already familiar with them.

In the first iteration I implemented two lower-fidelity black and white interactive prototypes. I started by building the different views views using Sketch. I used ready-made elements from the Material Design Sketch Resource by Google (2018) to implement the prototypes more quickly. I imported the finished views to the InVision prototyping tool, where I made the prototypes interactive.

After finishing the prototypes on the first iteration we discussed them with the thesis instructor. Based on our discussion I made still some minor changes to the loan view pages for both prototypes to make them more differentiating from each other. The first iteration prototype sketches can be found in the section 6.3.1.

In the second iteration I started building a higher-fidelity prototype. Building the prototype included redesigning the layouts of the previous prototypes, adding more views to them and implementing the persuasive features. To fit all the features into the prototypes and make it more detailed but still ensure the app was easy to use and visually appealing was challenging and time consuming. The second iteration prototype views are represented in the section 6.3.2.

6.3 Prototype

In this chapter I introduce the outcomes of the design and implementation phases. I first introduce the layouts and functionalities of the two lower-fidelity prototypes from the first iteration. Then I show the second iteration final prototype layout as well as describe the added features including the persuasive features.

6.3.1 First iteration prototypes

The first iteration prototype A main screens can be found in Figures 6.1 - 6.3 and first iteration prototype B main screens in figures 6.4 - 6.5. These screen shots only represent essential views and features needed to complete the most important tasks with the self-service system.

The first screen in Figure 6.1 represents the loans view, which is meant for checking the current loan status. The loan view works as a landing page in the prototype A. In this view the installments are visualized with a bar showing the paid and remaining installments. Additional information regarding the loan can be found in on the loan details view (see final prototype version of loan details in Appendix D), which is accessible from the loans view. On the bottom of the loans views in Figure 6.1 we can see the main navigation tabs that are used to navigate between the most common views.
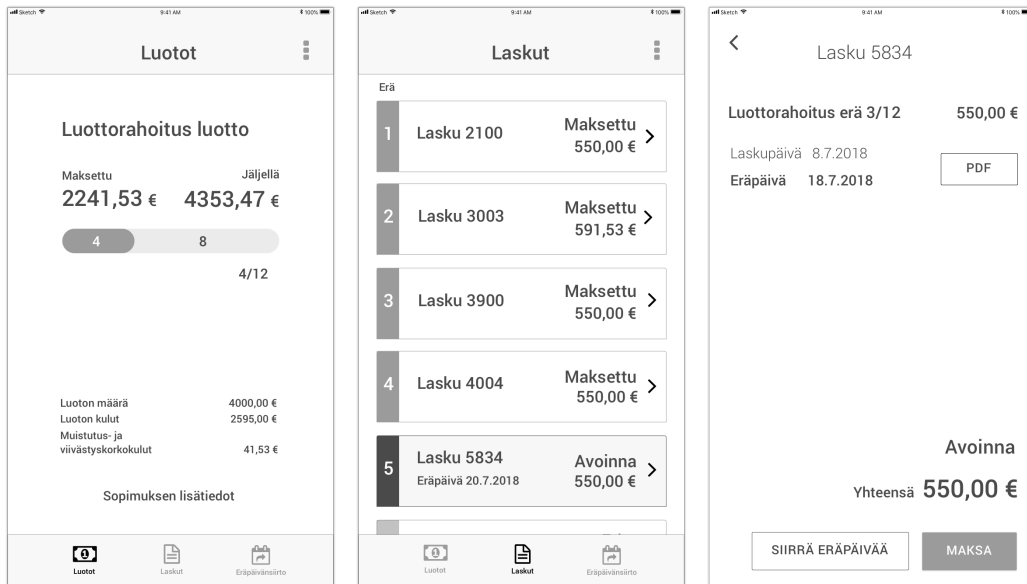
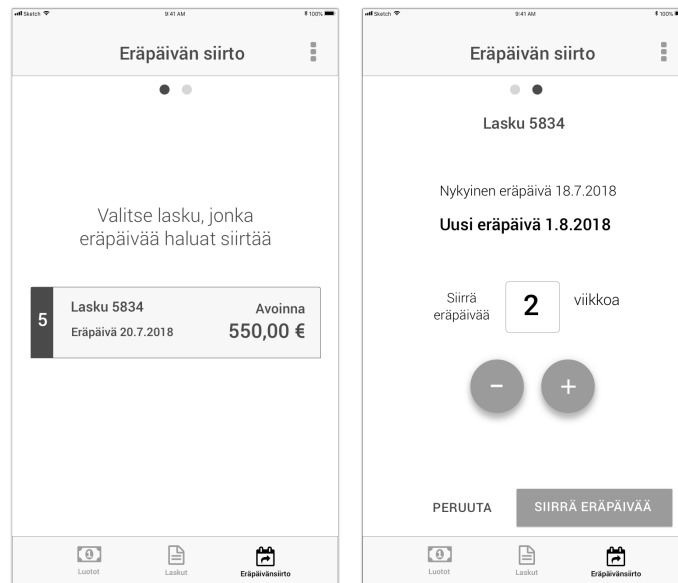Figure 6.1: Prototype A - Loans view, open invoices view and invoice details view

Figure 6.2: Prototype A - Postpone invoice due date views

In the second screen in Figure 6.1 we can see the list of invoices page that can be found from the bottom navigation of the prototype A. In this prototype the invoices are listed in a chronological order from the oldest to the newest ones. By tapping an invoice in the list we can move to a single invoice view shown on the right in the Figure 6.1. On the single invoice view the user can open the invoice copy as PDF, pay the invoice and move its due date.

The invoice due date can be moved from its own view in prototype A represented in Figure 6.2. The left side screen shows the invoice, which due date can be postponed.
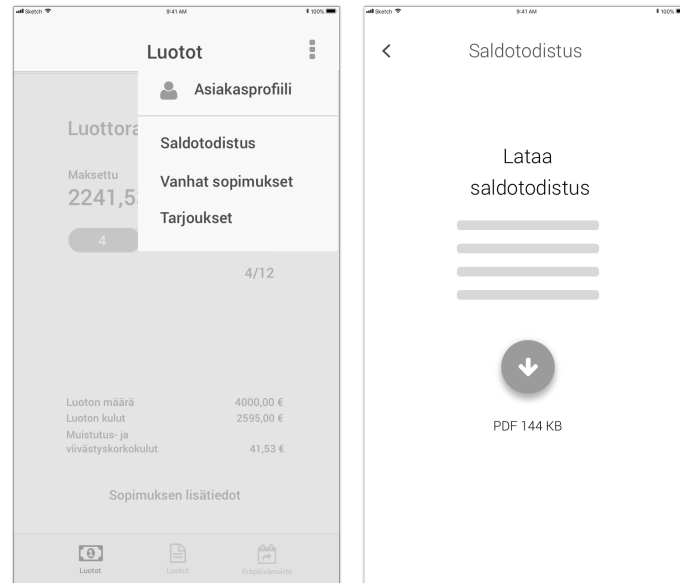
Figure 6.3: Prototype A - Right upper menu and download balance certificate view

By tapping or clicking the invoice the user is able to move to the right side screen in the 6.2. This view shows the invoice's current due date and gives an option for the user to postpone the due date. The date can be postponed from one to four weeks by tapping the plus- and minus-buttons and then the "Move due date" button. Before the user can postpone the date he or she must confirm the action on a dialog the opens up on the screen. After this the user is informed about the successful postponing of the due date. These equivalent screens of the final prototype can be found in the Appendix D.

The figure 6.3 represents the open top right navigation of prototype A as well as the view for downloading the balance certificate PDF. The top right navigation includes the more seldom used options: customer profile, downloading balance certificate, old contracts and loan offers.

The prototype B has similarities and differences with the prototype A. The Figure 6.4 shows the prototype B loans screen on the left, which is the landing page for this prototype as well. This view has a different visualization for the loan status and it includes more information about the loan by showing the open invoices and invoices that are late. By tapping on the hamburger menu on the top left of the loan view the user can open the menu shown in the right screen of figure 6.4. This is the main navigation of the prototype B.

By selecting the 'Invoices' option from the main menu we get to the invoices page shown in the left screen in Figure 6.5. These views have inner navigation for accessing open, paid, upcoming and all invoices as seen at the top of the page. By tapping an invoice we can open a single invoice in the same way as in the prototype A represented in the Figure 6.1. Invoice details view is similar to the one in prototype B.
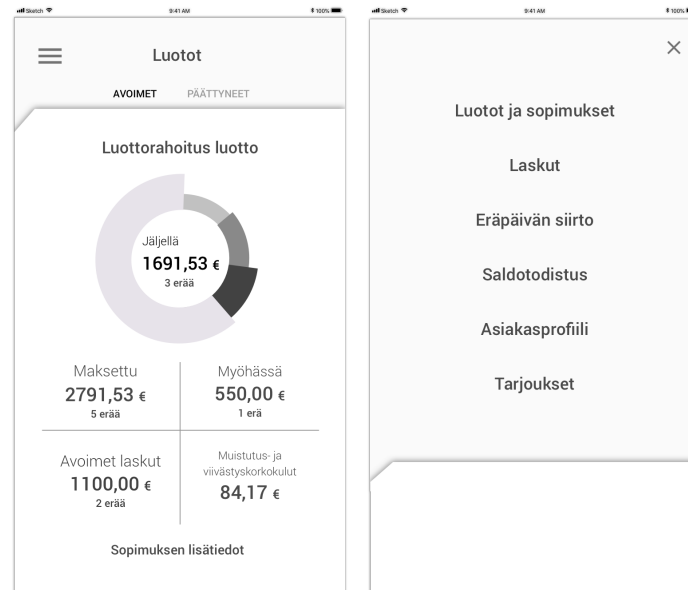
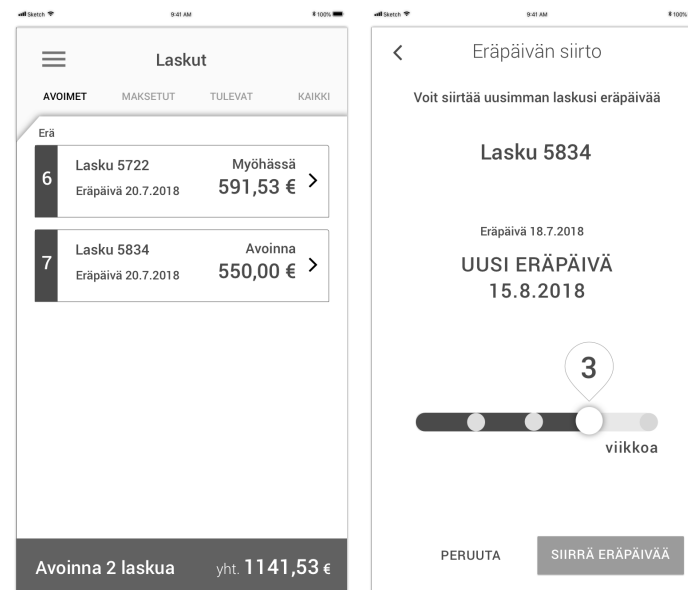Figure 6.4: Prototype B - Loans view and open hamburger menu

Figure 6.5: Prototype B - Open invoices and postpone invoice due date views

In addition to the loans and invoices views and the navigation, the postponing of an invoice due date works slightly differently in the prototype B. When choosing the 'postpone invoice due date' form the main menu in prototype B we can access the screen shown in the right side of Figure 6.5. This prototype directly shows the postponing page for the most recent invoice without requiring the user to select it. The view has a slider as an input for selecting the week amount for the postponing. Similar to the prototype A postponing due date page, also this prototype requires the user to confirm the postponing and informs the user when the postponing was successful.

6.3.2 Second iteration prototype

The second iteration prototype is a combination from the first iteration prototypes A and B with added features. The screens of the prototype are represented in Figures 6.6 - 6.11.

I decided to use the tab bar menu because it was preferred by more users in the users testing. Our prototype has a tab bar menu located on the bottom of the screens (see Figure 6.6). The menu shows the most important options for the user and is visible all the time. Based on the user feedback I made all the menu options accessible from the same place. I added an "other" menu option to the tab bar. This view contains the more seldom used menu options as can be seen in the right side screen in Figure 6.6. The tab bar menu is more efficient because the user does not have to open the main menu each time when changing between the common screens. [1].
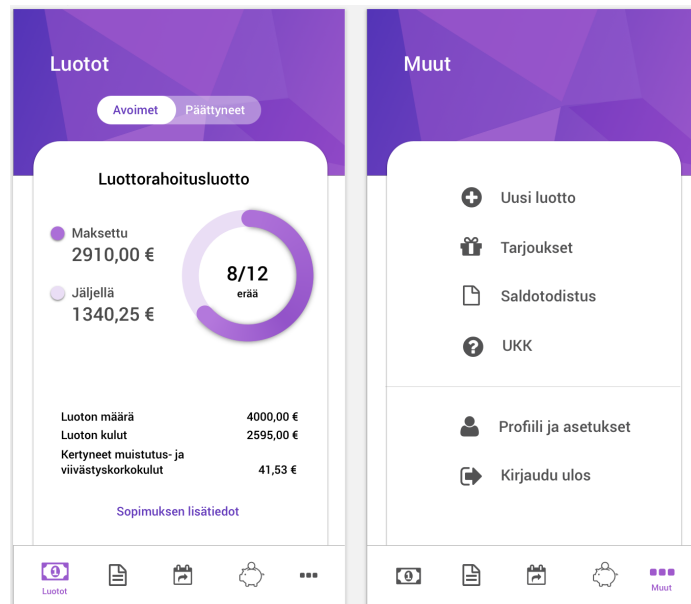
Figure 6.6: Final Prototype - Loans view and "other" options menu view

I wanted to keep the loans page simple and not add any more information to it. The loans screen can be seen in the left side screen of the Figure 6.6. I used the idea of donut chart in the design because the users liked it but I made it more clear by reducing information and the different thicknesses that caused confusion among the users.

Figure 6.7 represents the open invoices and invoice details views. In the invoices view I used a top tab bar because it was preferred by most of the users. The advantage of it is that the user can see the open invoices at a glance when opening the view. I removed the "upcoming" invoices tab used in first iteration prototype B to slightly

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[1]Piggy bank free icon made by EpicCoders (https://www.flaticon.com/authors/epiccoders) from www.flaticon.com is licensed by CC 3.0 BY (http://creativecommons.org/licenses/by/3.0/).

reduce information. I added colored boxes to the left corners of each invoice box to indicate the payment status of the invoices more clearly. I added a "pay" button on the open invoices to make a call for the paying action.
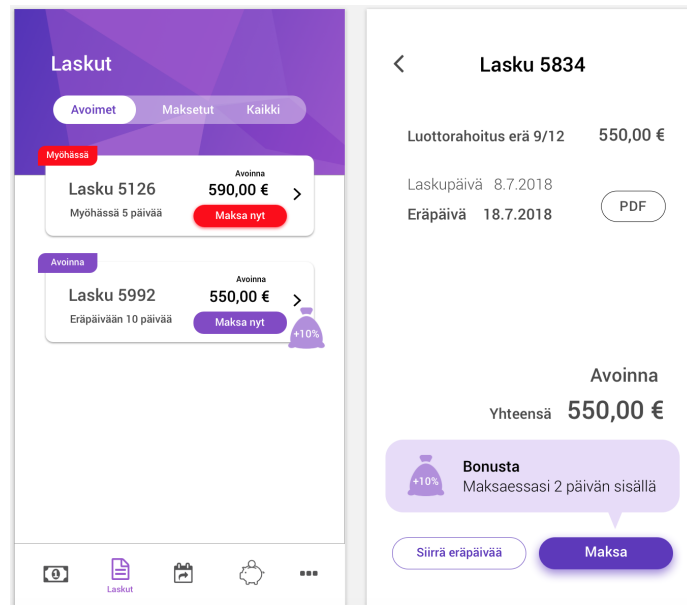

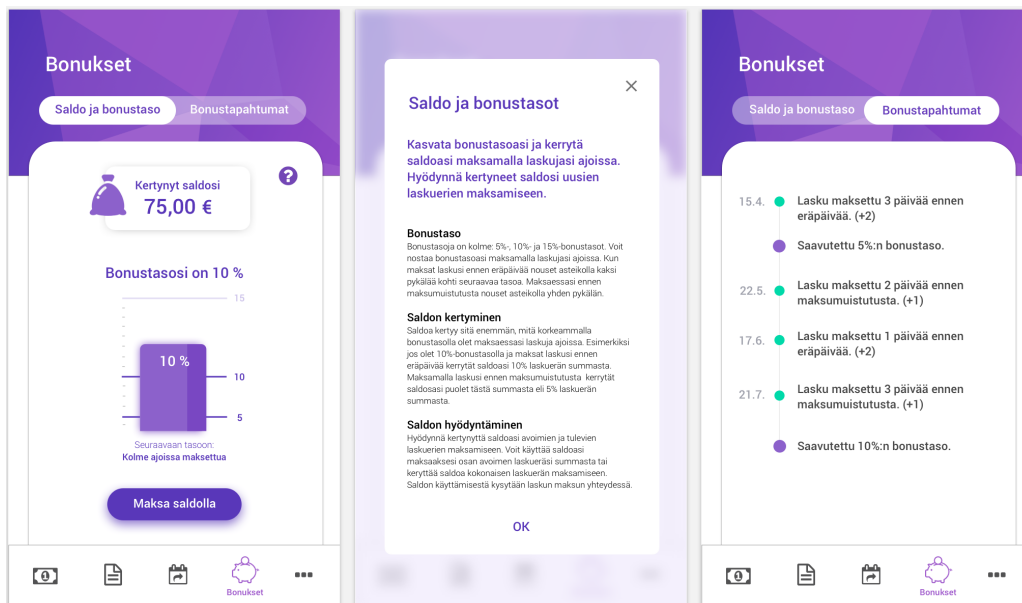Figure 6.7: Final Prototype - Open invoices view and invoice details view

Figure 6.8: Final Prototype - Balance and bonus view, instructions of bonus system and bonus activities view

We designed a reward system for encouraging users to a better payment behavior by giving discounts from invoices. The reward system is located in the "Bonus" tab in

the tab menu (See Figure 6.8). The idea of the rewards is that the user has a balance that accumulates each time the user pays his or her invoice back in time. The balance grows with a percentage amount of the invoice each time an invoice is paid back in time. The accumulated balance can be used to pay back upcoming invoices.

The bonus percentage is dependent on the user's continuous payment behavior. The user's current bonus percentage is represented in a bar chart shown in the left side screen in Figure 6.8. The user gets two steps up in the bar each time he or she pays an invoice back before the due date. If the user pays an invoice back only before the payment reminder the user gains only one step upwards. If the user pays any later the user gains no steps upward but if an invoice is moved to the dept collection the user loses two steps. The instructions for the bonus system are represented in the view shown in the middle screen in Figure 6.8. This view is accessible from the question mark icon in the left side screen in Figure 6.8. The bonus view has another tab that shows a list of user's activities that have increased or decreased the bonus percentage and accumulated the balance (see right screen in Figure 6.8).

Because we are targeting to improve the payment behavior of the users I added bonus signs (money bag icon) to the invoices and invoice details views (see Figures 6.7) to remind about the bonuses. A bonus sign represents the bonus percentage that the user can get when paying the specific invoice back at that moment.
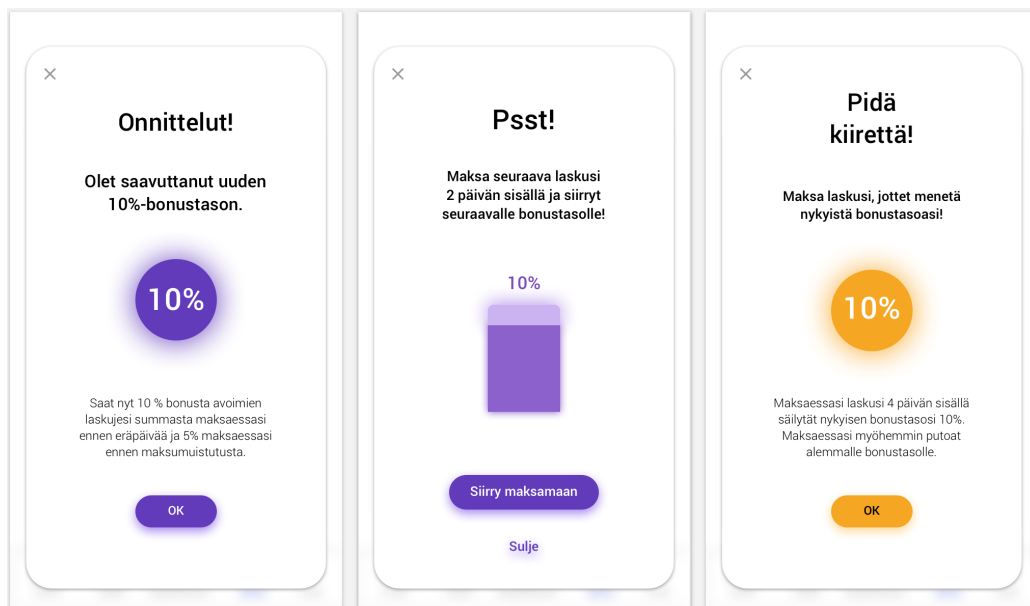

Figure 6.9: Final Prototype - In-app suggestions

We wanted to add more aesthetics to the second iteration design by creating a look and feel the aim to pleasure the user. I tried to create a look that would represent a modern mobile application that keeps the user interested in its content. The colors aim to enliven the UI and simultaneously guide the user to the primary actions. I tried to come up with a neutral look that speaks to all the user but that would not

be too boring. In the interactive prototype I used InVision animations to make the prototype more fun to use and to guide the user between different view and actions.
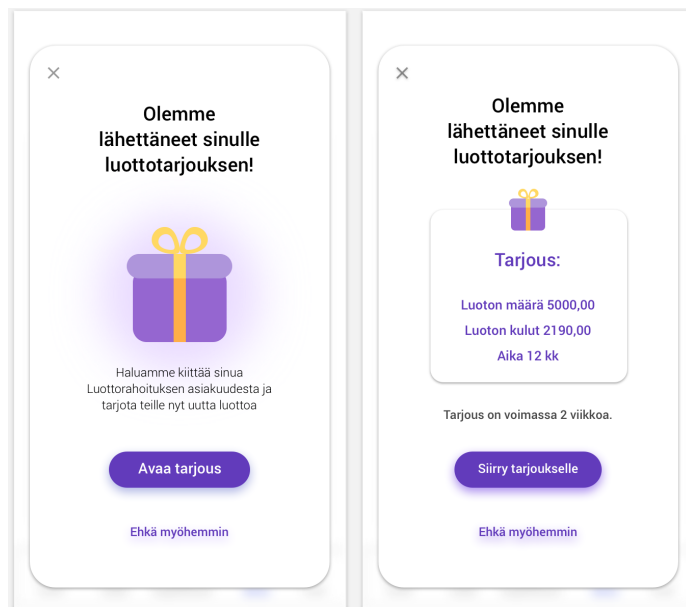

Figure 6.10: Final Prototype - New loan offer

I implemented suggestions and reminders as notifications to encourage and remind the user of paying back in time. These notifications are available inside the system as seen in Figure 6.9. When using a mobile application, the user can get notifications on their mobile. These mobile application notifications can be found in the Appendix D. The users with good payment behavior will receive suggestions for continuing their behavior to reach better bonuses and the ones with worse payment behavior will be reminded about their payments.

In addition the users that have paid their loan in time will be sent personalized loan offers seen in Figure 6.10. The loan offer is a reward for the users with good payment behavior.

Some of the first iteration prototype views remained almost as in the previous prototypes and some other new views were added. The postponing invoice due date was selected to be better in the first iteration prototype A. We did not make any clear modification to this view. Also, the downloading of balance certificate was kept almost as it was. The postpone invoice due date and balance certificate views in the second iteration prototype can be seen in the Appendix D.

Moreover, I implemented views for the company profile, paying invoices, recently asked questions and an onboarding process. In the profile view (example: see left side screen in Figure 6.11) the users can change their company information and billing details by themselves if needed. The payment views guide users through payment actions (example: see in middle screen in the Figure 6.11). The recently asked questions aim to answer to the users' questions and thoughts without them having

to contact the customer service or try to find the information online (example: see the right side screen in the Figure 6.11). The onboarding introduces the main functions and the reward system when the user takes the system into user for the first time. The rest of screens and the the onboarding process is represented in the Appendix D.
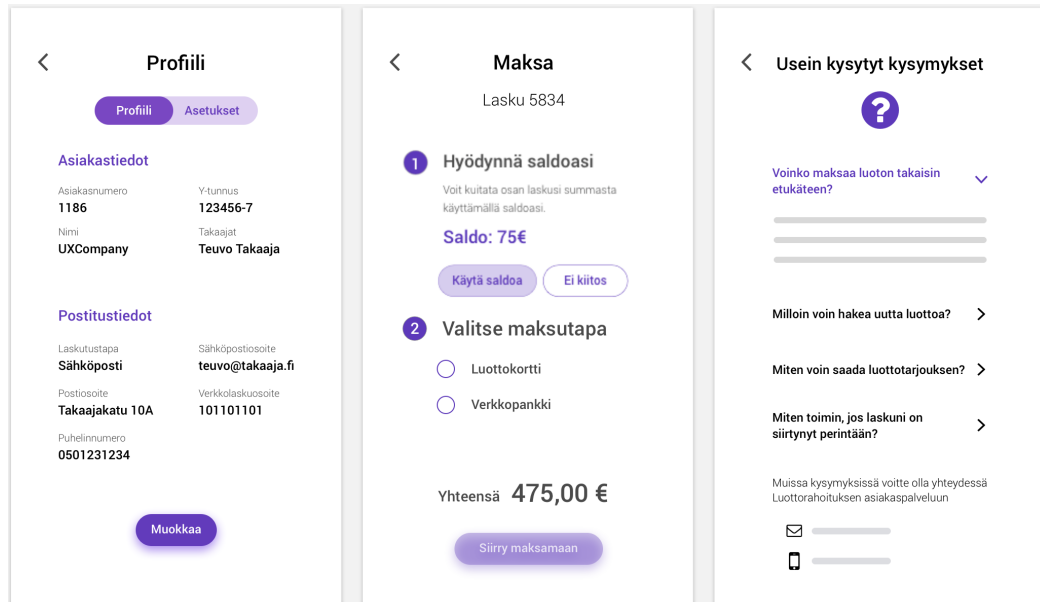

Figure 6.11: Final Prototype - Company profile view, invoice payment view and recently asked questions view

Chapter 7

Evaluating the User Experience of B2B service

In this chapter I evaluate the designs against concepts and requirements. I want to know whether the requirements for both iteration one and two prototypes are fulfilled and if the targets for the UX are achieved. Before implementing prototypes, I selected the evaluation criteria, which can be found in Chapter 4.4.

7.1 Evaluation with users

In the first iteration of our design process I tested two lower fidelity interactive prototypes with the users. The prototypes were tested using test tasks, which were based on scenarios created in the analysis phase in Chapter 5. In addition, I interviewed Luottorahoitus users to get insights to their needs, wants and thoughts. In this section I go through the recruiting process of the test users, conducting the interviews and prototype testing and the analysis and observations of the tests.

7.1.1 Recruiting test users

Our target for the recruiting was to get at least five participants to the user tests. The requirements for the participants were that they should represent the real users as well as possible. In order to get suitable test users, we formed a list of current Luottorahoitus customers to be contacted.

The recruiting process started by sending an email to customers working in the Helsinki capital area. The email informed them about the study, its purpose and the possibility to take part in a face-to-face interview and prototype testing session in the Helsinki. The customers were told that the sessions were recorded for the purpose of the study and they would be rewarded with two movie tickets when taking part in the study. On the next day after the emails were sent I called the customers and asked whether they would like to take part in the session.

When I started calling the participants I quickly noticed that customers working in the Helsinki capital area had no time or were not eager to participate in the study.

This forced me to change the planned face-to-face interview and testing to Skype video calls done remotely (Microsoft, 2018). The video channel gave us the possibility to interview customers working in different parts of Finland. I selected Skype for video streaming because it is common and has the possibility for screen sharing. Screen sharing was necessary for recording the testing of the prototypes.

When a customer volunteered to participate in the study we arranged a date and time for a Skype meeting. Two days before the video call the participants were sent an additional email informing how they should prepare themselves to the session. They were advised to check that they had Skype available on their computer or access to the Skype web application, that they had an account and that they were able to log in to it. They were sent links to the prototypes on the InVision website in advance (InVisionApp Inc., 2018).

From the Luottorahoitus customers contacted only three volunteered to participate in the study. One of these participants was unable to access Skype so I had to conduct just the interview part by phone with this participant. Because the recruiting of current Luottorahoitus customers was not successful I had to widen the scope and recruit additional users for testing the prototypes. I tested the prototypes with additional three people. These test users were selected because they all were entrepreneurs or working under a trade name and they represented the remaining age groups that had not yet been tested.

7.1.2 Conducting interviews and tests

I conducted three interviews with customers and a total of five prototype testing sessions with customers and additional users. Before these sessions we held a pilot test with a Luottorahoitus customer service representative as a test user. The purpose of the pilot test was to ensure that the structure of the session was working and that the instructions and interview questions were understandable and openly formed. We tested the screen capturing and audio recording to ensure they worked as planned.

After the pilot test I had one-week time to make changes to the interview questions and testing procedure before the first actual test. Based on the pilot test we decided to add two more questions to the interview. I did not make any modifications to the scenarios because they were already realistic. The pilot test helped us in preparing to guide the test user remotely during the test in actions such as sharing their computer screen. I became aware of how the participants should prepare themselves to the tests to ensure everything would work as planned. Instructions for preparing to the test were sent to the customer by email as mentioned before.

The Skype video streaming sessions were held on times that were suitable for the participants' schedules. I acted as an interviewer and a moderator during the session. Before the call I turned on the screen and audio recordings, both of which were done with quickTime Player (Apple Inc., 2018). I used a laptop for calling and recording the sessions and the participant had either a desktop computer or a laptop of their own.

The session begun with welcoming the participant. I introduced the study and the structure of the interview and prototype testing session as well as gave some basic

instructions. Before the interview part the participant was asked if they had anything they wanted to ask related to the study or the session.

The first part of the Skype session contained the interview with the participant. The participant was asked questions related to their work and profession, free time, mobile and computer usage, especially usage of different persuasive applications as well as their thoughts on them and their experience of the current Luottorahoitus service. The questions can be found in Appendix E. The purpose of the interview was to get to know Luottorahoitus customers and understand their needs better.

After the interview we conducted prototype tests. Because the prototypes had to be tested remotely we could not use a actual mobile device for testing. Instead the users saw the prototypes on the Invision website in a mobile phone frame. I advised the participant to share their device screen in Skype and open up one of the prototype links to the InVision website. In this way the I could see and record user's actions when using the prototypes.

Every other participant was asked to conduct the test first with prototype A and every other first with prototype B. I introduced the idea and the procedure of the prototype testing for the participant. She told that she would introduce test tasks and the participant should try to complete them by thinking aloud at the same time. A list of the test tasks can be seen in Appendix F.

I introduced the tasks for the participant one at a time and the participant informed when he or she was ready with a task. After going through all the test tasks the participants were asked questions related to their interest to use this kind of service, the differences in the prototypes and in their usage and the content of the service. In the end I thanked the participant for taking part in the session. I recalled them also about the movie tickets that were sent to them.

7.1.3   Analysis and observations

After the interview and test sessions of the first iteration I went through the recorded video and audio material and analyzed them. The analysis and observations from both interviews and prototype testing are described in the next sections.

7.1.3.1   Interviews

I started by going through the participants answers to the interview questions. The topics of the interviews covered general questions, technology usage related questions and questions about the participant's experience of Luottorahoitus. I want to point out that the interviews were only conducted with three Luottorahoitus customers, so the answers only cover a small niche of the customers thoughts. I analyzed the material of the interviews to get small insights to the future users' thoughts and behavior as well as similarities and differences in them.

The three participants mainly used computer for work related purposes and to email and banking activities. Smart phones were used mostly to the same purposes as well as for messaging with for example Whatsapp and Facebook. One participant said that *"smart phone has taken the place of the computer at some extent"*. None of

the participants were playing mobile games. One mentioned that he sometimes plays PlayStation with his kids and one told the only game he plays is Eurojackpot. One participant said: *"No, way! I haven't been drawn to such things"*. Two participants were using tracking applications like Nordea Pay and a pedometer application. These applications were used for tracking own behavior and aiming for small targets. One participant said that *"I think this kind of applications are good, they encourage you in a way"*.

I asked the participants if they were using any applications with reward systems. Two participants stated that they would not use a specific application or service only because of a bonus system. *"I'm not eager to buy from a certain place, I want to buy from the place that feels best"*, one participant said. But they agreed that good offers can affect at least one-time behaviors. The participant though that bonuses and discounts should be quite significant to be effective.

The participants' attitudes towards technology usage becoming more and more common was in overall positive. They were mainly positive to learn new ways of using technology. However, two participants stated that it can be hard to follow the speed of the technology development. One participant said: *"It feels like I'm not keeping with the development"*. Users valued the possibility of being able to do things where ever and whenever it is needed. *"Today I'm not bound to a place"*, said one user who pointed out that she can do work related issues on the go.

The participants mentioned some bad sides of the technology development. They highlighted the that not all services that use some technology channels seem to be trustworthy. One participant was concerned of the amount of information that is continuously gathered from individuals using services. *"Of course it is good but sometimes it feels irritating"*, said a participant when he talked about the information gathered from people on the web. One participant said that technology enables anonymity, which can ease some situations but does not help in building trust with a specific service provider or their personnel.

All of the participants valued Luottorahoitus because it offers money quickly for their business needs, but they still found the service expensive. Users said that getting money from bank is much slower or sometimes impossible. Two participants had compared loans from different providers and thought Luottorahoitus had the best offers. However, all of them found the prices of the loans were very high. *"Quite high interest rates but a big help to the situation"*, said one user. One participant mentioned that if she would apply for a new loan from the same provider she would expect the price to be cheaper next time. One participant pointer out: *"There could be an incentive for paying the whole loan back earlier"*.

Users found that the main reasons for applying for a new loan from the same provider would be the time for getting the money to bank account and the expenses of the loan. *"It is the speed for getting the money that matters the most"*, said one participant. The overall quality of the service was mentioned to be an important criterion. One participant said that he had applied for several loans from Luottorahoitus because he knows the process and practices of the service and does not have to learn anything new, which he finds convenient. *"Once you have handled your payments well*

it is easy to get more money from there", he added.

Again, we have to take into account that these are only the opinions of three customers and they do not provide comprehensive insights from the opinions of all Luottorahoitus customers. It is important to continue understanding the users' needs and wants by performing more interviews after this project work.

7.1.3.2 Prototype testing

The analysis of the prototype testing began by writing down insights and comments form users during the test sessions. The insights were written under different categories similarly to affinity diagramming. They were related to users' interest of using the service, the preferences and problems in different views and navigation of the prototypes A and B and the overall content. If a similar kind of insight appeared several times it was marked with a number in parenthesis. The main points in our diagram of user insights can be seen in Figure 7.1

Our first evaluation criteria, the interest in use of the service, was perceived high by the users. All of the 5 users said they would use this kind of service if it was available. The users mentioned the benefits to be that making actions with the application is not time-dependent and that users can manage their loans themselves. *"I think I would rather user this than contact the customer service"*, said one user. Two users mentioned that they would like to maybe rather use the service as a web application than download it as a mobile application. This was because they thought they would not need to use it very often. One user mentioned that the service would be especially useful if it sent you notifications of invoices and invoices were easy to be paid through the service.

I asked the users how they perceived the use of the different prototypes by comparing them. The navigation of the prototypes shared opinions between the users. Three of the users found the navigation of the prototype A to be quicker and more effortless to use. Two users found the hamburger menu navigation of the prototype B better because it was similar to other systems they had used and because everything could be found from the same place. One user that preferred navigation of prototype A suggested that all the options could be in the same menu on the bottom bar. The right upper menu in A was found to be slightly confusing because often this kind of vertical dots menu contains options like settings and logging out.

The users preferred the loan page of prototype B but found the euro sums unclear in it. Three users commented that the visualization was nice, and you can see more information regarding your loan in the prototype B loan view. But the relation of the numbers to the donut chart was not clear enough. The prototype A was said to be boring but simpler and clearer.

The invoices page divided opinions. Two users said they would prefer the invoices list in the prototype A where you see all the invoices in the same view. Three users thought that the invoice list in B is better because you can see the open invoices strait away on the first open tab. One user commented that B would not need all the four tabs and that two tabs could be enough.

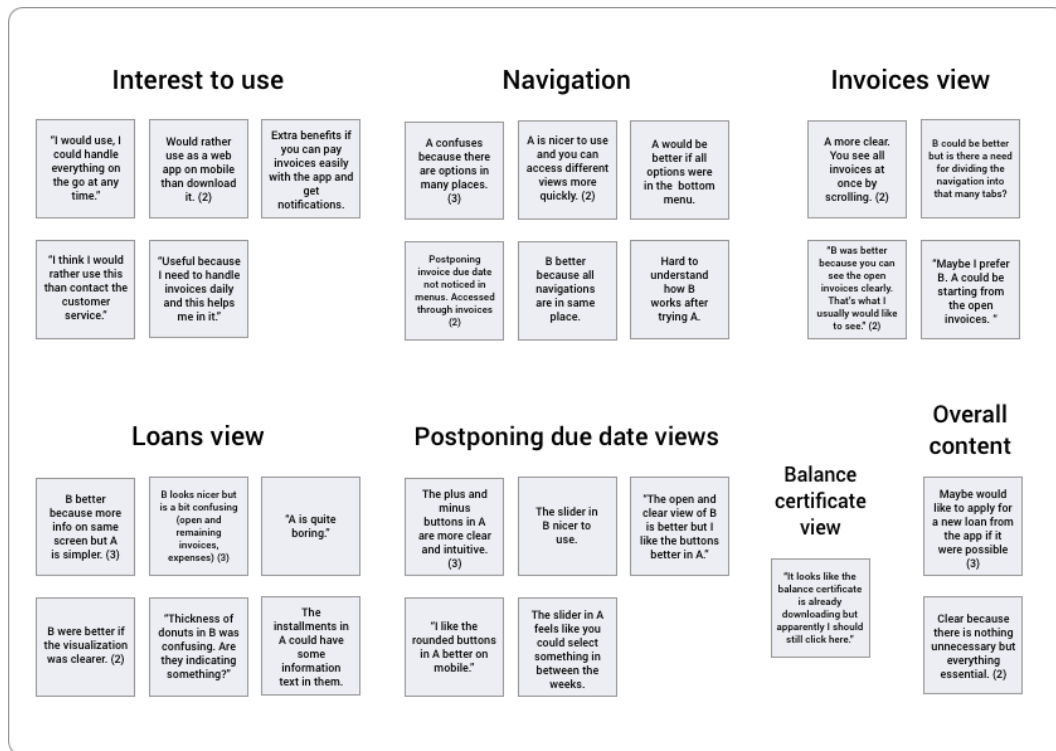Postponing due date view was perceived better in the prototype B by four users.

Figure 7.1: Affinity diagram of comments and insights from user testing

The buttons were perceived nice to use and clearer than the slider. Only one user preferred the slider more. Another user commented that the slider is confusing because it can indicate that you can choose something between the available options. Interesting was that two users navigated to the postponing of due date in both prototypes through an invoice even if there were an own section for it.

After comparing the prototypes, I asked the users whether the overall content of the service met their needs and whether there is something missing or something unnecessary. One user commented: *"It is clear because there is nothing unnecessary but everything essential"*. Two users found that the service had everything they would need. Three of the users commented that they would like to be able to apply for a new loan through the service after paying back the old loan.

In addition, there were some small confusions that arouse from the prototype testing. Three users found the open invoices part on the loan screen of the prototype B to be unclear. The difference between the open and the remaining invoices was not understood. Three users commented that the expenses of the invoice reminders shown in the loan pages of both prototypes were confusing because they did not know where these expenses were related. One user was confused because the reminder expenses were not visualized in the circle in the prototype B even though all the other sums on the screen were.

The order in which the users tried the prototypes affected the use of them. The tasks with the first prototypes, whether it was prototype A or B, took longer than the

same tasks with the second prototype with all users. Two users that tried first the prototype A had problems in figuring out how prototype B works and vice versa. Users first automatically tried to find the actions in the same places as in the first tested prototype. In overall the task completion times between the users and the prototypes were not remarkable because the tasks were straight forward.

7.2 Expert evaluation of persuasive user experience

In the end of our second iteration we conducted expert evaluations of the persuasive features of the higher fidelity prototype. The next sections introduce the expert evaluators and the evaluation process as well as the analysis of the expert evaluation results.

7.2.1 Experts and evaluation process

I recruited two experts to evaluate the design in addition to the authors evaluation to make sure I got an objective view to assessing the persuasive features. The expert 2 was a Master of Science in Software Engineering specialized in service design and the expert 3 was a 7th year computer science student with four year's experience with web and UI design. The two additional evaluators were recruited via word of mouth.

The experts did the assessments of the system independently. Before the evaluation the experts were asked to study the PSD framework and the persuasive design principles by Oinas-Kukkonen and Harjumaa (2009) During the evaluation the experts tried to recognize the PSD principles in the prototype design by going through the interface of the interactive prototype. The experts were asked to rate the presence of each principle with a 1-5 scale (5=very much present, 4=clearly present, 3=neutrally present, 2=somehow present, 1=not present) in the interface and write down the reason for each evaluation decision. They were asked to write down improvement ideas related to the prototype as well.

After the independent evaluations we discussed the experts' ratings and findings through face-to-face discussions. We discussed whether and in what ways the prototype contributes to the behavior and what could be improved to strengthen the features.

7.2.2 Analysis of results

Table 7.1 shows the results from the evaluations of the three experts against the selected PSD principles as well as the average scores and standard deviations for the ratings. The ratings for the presence of the persuasive principles differed distinctly between the principles but the standard deviation of experts rating for each principle were quite small. This indicates that in most cases all the experts found the principles similarly present in the system.

Reminders were seen to be most present of all principles and it was evaluated as 5/5 by all experts. All the experts agreed that reminders were seen as a key feature

in affecting user's behavior. Reminders are shown to the user for example of new invoices, payment reminders, changes in the bonus levels and new loans. Users are continuously reminded of the bonuses they can get from invoices. Reminders were seen to be a important factor for other principles to actually work. For example, principles like reduction, self-monitoring, rewards, tunneling and personalization were seen to be partly or fully dependent on reminders that are shown to the user.

Self-monitoring was seen to be much present in the system. The presence of the principle was evaluated to be 4.7 on average. Users are able to monitor their own payment behavior constantly through different views. The loan and invoice view were seen to help the users to follow the amount of paid installments and sums as well as the open, late or paid invoices. In addition, user could monitor their payment activity through the bonus view by following the increasing or decreasing bonus percentage over time. One expert suggested that the system could show graphics of user's previous payment behavior to increase self-monitoring even more.

Rewards were seen clearly present in the system and its presence got an average rating of 4.3. The rewards of increasing balance for paying back invoices in time were definitely seen working for improving the target of better payment behavior. Offering existing users new cheaper loans was seen as a clear reward that could lead to increased customer loyalty. Rewards were seen to be brought up well in different places. For instance, invoices were marked with money sacks to remind of the accumulating balance.

Tunneling was rated on an average of 3.7 with the standard deviation of 0.94 in the expert ratings. The experts observed that the system uses tunneling in bringing the user closer to the target behavior during the whole payback process of the loan and in taking new loans. More specifically the bonus system was seen to activate the user to pay invoices by giving the possibility to accumulate balance. The payment view was seen to use tunneling to guide user to the payment actions by using numbered steps. Notifications were seen as a key factor for the tunneling to work in the system.

Use of personalization divided opinions among the experts. Two experts rated the presence of the principle to 4 and one rated it as 2. The presence of the principle got an average of 3.3 on the evaluators. Personalization was seen to be used in the personalized loan offers, reminders and suggestions based on user's payment behavior and the loan status view. One expert felt that there were not that much content that actually could be personalized. Another expert mentioned even though personalization was used for example in the loan offers, the offer did not actually feel personalized. This could be improved by highlighting that the offer is just for the user's company and informing that it is given to them because of their good payment behavior of the previous loan.

The visual look of the system was described as neutral, restrained, business-like, modern and suitable for a financing company but slightly generic. The presence of principle liking was rated on an average of 3.3 by the experts. The interface was seen to work for different age and user groups. Animations in the system were seen to improve liking by making it fluent to use. Longer-term use and goal-oriented features like the bonus system were seen to improve the liking more. One expert explained that for

example by using the system for a longer period of time can increase liking because the accumulating balance. All of the experts thought that more visually engaging elements and graphics could be still added to the system to make it even more attractive.

Reduction was seen to be neutrally present in the system and was rated as 3.3 on average by the experts. The system was seen to be reducing the effort of paying invoices back in time, checking loan related issues and taking new loans, which all are target behaviors of the users. Reduction was obtained by using reminders and reducing steps needed to complete different tasks. One expert commented that the system could have a positive effect on how the users experience the whole loan payback process. Moreover, the system could reduce the contacts to Luottorahoitus customer service because it works as an optional way to act.

Principle	Presence of principle evaluated by expert				
	Expert 1 (author)	Expert 2	Expert 3	Avg.	SD
Reminders	5	5	5	5.0	0.00
Self-monitoring	4	5	5	4.7	0.47
Rewards	5	4	4	4.3	0.47
Tunneling	3	5	3	3.7	0.94
Personalization	4	2	4	3.3	0.94
Liking	4	3	3	3.3	0.47
Reduction	3	3	4	3.3	0.47
Surface credibility	3	4	3	3.3	0.47
Suggestions	3	3	3	3.0	0.00
Praise	2	2	3	2.3	0.47
Trustworthiness	2	2	2	2.0	0.00

Table 7.1: Results from expert evaluations. Presence of PSD principles are rated with a 1-5-point scale (5=very much present, 4=clearly present, 3=neutral, 2=somehow present, 1=not present at all) by each expert. Average scores and standard deviations (SD) for ratings are calculated.

Suggestions were perceived neutrally present (3.0) and praise little present (2.3) in the system. Experts explained that suggestions are shown to the user depending on their payment behavior. Suggestions propose the users different actions to help them cope with payment issues and encourage them to choose preferable actions. Suggestions were seen to use praise in a way to appeal to the users behaviors via words and icons. Praise was seen to be used to give feedback to the users in different actions like postponing due date or saving changes to profile information. One expert felt that praise could be more enthusing in the system. For example the loan offer should actually feel like you have earned it by paying well.

Surface credibility was seen neutrally present (3.3) but trustworthiness was only a little present (2.0) in the system. The interface was seen to have a competent and good quality look. There were no views with overwhelming amount of options and no elements that would drag too much attention from the important actions. An ex-

pert mentioned that a clear main page or home page could increase the credibility of the system. Trustworthiness was found present in the recently asked questions, the available payment methods and the contract terms. Experts thought that trustworthiness could be increased by adding information about topics like where the information about the users is saved, what information is collected, how the information is handled and some information about Luottorahoitus as a service provider.

7.3 Summary of results from interviews and prototype evaluation

As a result of the interviews I can say that there are some users have some common opinions and behaviors among Luottorahoitus users. The users are active or semi active mobile and desktop users who have a positive attitude against technology development. The users sometimes use or have previously used applications with reward systems and self-monitoring features. Users tend to experience self-monitoring encouraging but rewards are usually not seen to bring much value. Rewards must be quite effective to actually affect their behavior in some way. The users found the Luottorahoitus current loan application process quick and easy and a large help in financing their businesses. However, the users found the price of the loan high. In addition to the similarities, differences between users arose from quantitative user data and discussions with Luottorahoitus experts. The knowledge gathered from the interviews were exploited in constructing personas and scenarios described in the Chapter 5.2.

The most important results from the user testing in the first iteration was that all the test users felt they would benefit of the system and had an interest to take this kind of system into use if it were available. The content in the system was found relevant for the users and they valued the fact that the system was easy to use and there were not too many features and information in the system. The importance for implementing both a mobile and a web application was confirmed because the preferences for the platform were divided among the users. Based on the feedback from the user testing I was able to design the final layout and navigation by taking the best elements out of the two prototypes. The feedback also helped us to refine requirements for the second iteration prototype.

As a result from the expert evaluation against the PSD principles present in the system I can state that all the selected PSD principles were present in the design. However, from the most important selected principles, personalization, liking and rewards, only rewards were seen to be much present in the system. This indicates that only rewards were seen to have a clear effect on taking the system into use, improving the payment behavior change and customer loyalty. In addition to rewards I found out that reminders and self-monitoring were effective in aiming for these behavior changes.

Personalization and liking were evaluated to be only neutrally present. We have to notice that personalization however got a lower rating from one expert because she did not perceive the content personalized, which lowered the overall score. Liking could have been rated higher if there were more graphically beautiful elements that would

appeal to users. Still we need to consider that the look and feel needs to be quite neutral to appeal for all user groups. Even though self-monitoring and reminders were evaluated to be more present than the selected most important principles, they were seen to actually support the effect of all the other features.

An important notice of the evaluation against persuasive principles was that the principle of trustworthiness was rated to be only somehow present in the system. This is a critical observation because trustworthiness in a financial service provider is crucial. The concerns about internet-based service providers trustworthiness was brought up in the interviews of the customers. The trustworthiness in the system must be improved, however already by adding more information about the company and the ways they handle things will make a large difference in the trustworthiness.

From the expert evaluation I found out that some of the principles were more important for first time users. For example, surface credibility, liking, personalization, suggestions and reduction can affect the users straight away when opening up the application for the first time. The effect and value of principles like rewards, tunneling and self-monitoring is perceived in a longer period of time.

Chapter 8

Conclusions and Discussion

The objective of this thesis, as framed in chapter 1.2, was to conceptualize and design a persuasive mobile and web-based self-service information system. The purpose of the application was to improve Luottorahoitus user experience, establish more loyal customer relationships, free resources from customer service and make additional sales. In this final chapter I give answers to the research questions described in Chapter 1.2 and discuss the results obtained in this work. Next, I compare the results with previous studies and discuss the work's limitations. Finally, I give suggestions for the future work.

8.1   Research questions

The main research question asked, "what kind of persuasive user experience should be designed into a B2B financing system?". To be able to answer this question I divided it into two sub-research questions. I start by addressing these two questions and give the answer to the main research question in the end of this section.

The first sub-research question, "who are the users of the future B2B self-service system (RQ1a) and how can the design meet their needs (RQ1b)?", was answered in the analysis phase of this thesis in Chapter 5. For modelling the users of the self-service system, I created personas, which represent the main user groups of the service. The personas were a result of analyzing the business literature, collecting user data, conducting interviews and testing designs with users. A distinguishing factor between the created personas was their payment behavior. The personas represent the user groups with good, varying and poor payment behavior.

All the user groups had some common needs regarding the system. Feel of control and time independence were factors that were important for all users. These kinds of preferences are typical for B2C self-service customers as noted in Chapter 3.1., which may be due to the fact that most of the users represent micro companies. The users preferred easy-to-use, clear interfaces with not too much content. There was a need for both mobile and web applications among the users.

The system aims to answer to the needs of the different user groups. The users with good payment behavior are rewarded with increasing bonuses and balance due

to making payments in time and with personalized and discounted loan offers. These users are suggested to paying invoices even earlier to get bigger bonuses. The users with varying payment behavior are rewarded with accumulating balance but at slower pace. They are not punished for paying occasionally too late. These users have the possibility to postpone their invoice due dates when they need to. The users with poor payment behavior are not potential loyal customers. They are constantly reminded about invoices, due dates and payment reminders. They are given reminders and informed about the dept collection when needed. These customers do not receive loan offers, the only aim is to get these customers to pay their loan back.

Who are the users and what are their needs highly depends on the context we are designing for and the system purpose. The constructed user groups may be generalized in the context of short-term loans because in this context users may have similar kinds of needs arising for example from payment difficulties as found out in Chapter 2.1. It is not clear if these user groups could be generalized to any other B2B financing services.

The second sub-research question for this study was "how to evaluate persuasive user experience of a self-service system?". The suitable way to evaluate a persuasive system depends on the stage of the design, what kind of behavior change we want to evaluate and the resources available. The second research question was answered in Chapters 4.4 and 7.

This study concerned the initial phases of the system design and we had a tight time-frame for conducting the evaluations. Because the design was in its first steps it was important to validate the overall users' needs and interests for using the service and the content as well as layout and navigation in the design. Comparative user testing with two low fidelity prototypes was found as a suitable method for testing and validating the initial version of the design. We were able to assess all of our evaluation criteria successfully and get honest and comprehensive feedback for improvements.

After validating the initial idea and design we evaluated the presence of the persuasive features in the higher fidelity prototype using expert evaluation. Expert evaluation was found as a sufficient method for the purpose of understanding, which features supported the behavior change in the system the most. Expert evaluation suited well for this stage because it was time saving compared to recruiting users and conducting user testing. Limitations of the evaluation with experts are discussed later in this chapter.

Based on the evaluation of the system prototype the design was successful. The design met the evaluation criteria for the first and second iteration prototypes. It supports and supplements the current Luottorahoitus services and brings the users a even better user experience in the future. The system brings a potential differentiation factor when compared to the similar kind of services online lending services in Finland that were discussed in the Chapter 2.3.

By answering the sub-research questions above I can now answer to the main research question: "What kind of persuasive user experience should be designed into a B2B financing system?". The results of this study indicate that a persuasive user experience designed into the service depends on the behavior change the system is aiming for as well as the user needs and wants. The aims for persuasion in the self-

service system were improving user's payment behavior, contributing to customers intention to use the service and improving customer loyalty.

As an answer to the main research question we can state that reminders, self-monitoring and rewards were important features in supporting the persuasive user experience that aims to improve and maintain user' payment behavior and customer loyalty as found out in the expert evaluations in Chapters 7.2.2 and 7.3. By giving the users the possibility to track their payment behavior and be reminded and rewarded of making payments contributes to paying invoices in time as well as taking new loans and becoming a more loyal customer. In addition, important factors for the overall user experience were usefulness, easiness to use and simplicity of the service as found out in the user tests described in Chapters 7.1.3.2 and 7.3. Both these factors and the persuasive features can be seen to affect the user's willingness to take the system into use and continue using it.

The results can be partly generalized in the context of B2B financing services. When a financing system is aiming for affecting user's payment behavior and customer loyalty, applying the same principles can be effective in achieving the behavior change. In addition, the results could be applied to other services with a similar aim for behavior change, for example to B2C financing services.

8.2 Relation with previous studies

Persuasive design has been applied to several contexts but there seems to be no prior studies in persuasive UX design in the context of B2B financing. Because the PSD model has been widely applied in a range of contexts (Lehto and Oinas-Kukkonen, 2010; Davis, 2010; Karppinen et al., 2016; Purpura et al., 2011), we decided to apply it in designing a persuasive user experience in the context of online lending services. The PSD model helped us to design a system that was evaluated to affect behaviors of users.

Other studies had evaluated persuasion in working prototypes or systems with users (Karppinen et al., 2016; Kaptein and van Halteren, 2012). But for evaluating early stage prototypes were not payed attention by previous studies. We thought that expert evaluation using the PSD principles would suit this purpose well because expert assessments can be valuable in early stages of design.

In previous studies expert assessments have been done based on the identified persuasive guidelines or principles. de Jong et al. (2014) and Sutcliffe (2002) have evaluated persuasion using different rating scales. Harjumaa (2014) has evaluated the presence of PSD principles applied to an interface using a yes or no (+/-) rating. I decided to use the 1-5 rating scale in the expert evaluations because I thought it would give us a better overview of what features are actually effective or dominating the persuasion. Without having the rating, we would not have gotten the understanding about what features affected the persuasion the most.

I discovered that customers' preferences for using the self-service system were closer to the typical preferences of B2C customers than to B2B customers. As discovered by Pujari (2003), typical consumer customers, and based on our results also Luottora-

hoitus customers, tend to value the ability to solve their needs easily at any time by themselves. The preferences for using the application can however be seen different when the application is showed after adding the persuasive principles. For example, B2B-customers usually prefer self-service systems because of savings in expenses, which is made possible by the bonus system.

We compared Finnish online lending services in the Chapter 2.3 and got to the conclusion that the services pretty much offer a same kind of service. The self-service system however would is a clear differentiation factor for Luottorahoitus. The system brings an advantage in providing a better UX for Luottorahoitus customers at least for a period of time. I recommend that after having a finished product the information of it would be brought to Luottorahoitus marketing message as a differentiating feature. Having a self-service system or even a reward system for B2B-customers seems not to be available in other online lending services.

8.3 Limitations

A limitation of the interviews was that I only got tree Luottorahoitus customers to participant in the interviews. Based on the interviews I can only carefully generalize insights that stood out from all tree interviews. I assume that recruiting participants was particularly hard because the interviews were conducted during summer holiday seasons but also because many customers have long working hours or are unwilling to share their opinions regarding their company's financial issues.

One limitation of the user tests was that not all the test participants were Luottorahoitus customers. Conducting all tests with real customers would have given the most certain results of their actual needs and wants. One limitation was that the users tested the prototypes with the Invision website with a mobile frame on a computer instead of a mobile device. A real device could have given the users a more authentic feel of using the system because they could have used for example gestures such as swiping to control the system.

I agree with Räisänen et al. (2010) of the challenges of applying the PSD framework in evaluation of interfaces. According to Räisänen et al. (2010) the PSD model would benefit of having predefined scales and introductions for evaluating the implementation of the PSD principles. This could be valuable when comparing results with different studies. Räisänen et al. (2010) point out that heuristics could help in reducing biases and help the evaluators be more objective in their evaluations.

The evaluators' interpretations and points of view different to some extent in the expert evaluations. For example, the presence of persuasion in the system was ranked with lower rating because it was interpreted differently by the experts. Another limitation of the expert evaluations was that all of the experts did not have the knowledge of B2B-financing domain. This caused an issue of the evaluators occasionally focusing on smaller interface issues and not always understanding the user's viewpoints.

Finally one limitation was that I was not able to evaluate the long-term effect of the persuasive features, which was already taken into notice in the scope of the work. The actual behavior change regarding the users' payment behaviors and improved

customer loyalty can only be assessed with a working prototype during a longer period of time with real users. Other long-term effects that could not be studied during this thesis are the benefits for the company, such as reducing contacts with the customer service, making additional sales and getting a better understanding of the users.

8.4 Future work

Because this thesis work only focused on the design and conceptualization of the self-service system, the design and development of the system should continue. I will recommend first to improve the current prototype based on expert evaluation results and observations of this work. After this the prototypes, especially its persuasive features, should be validated with Luottorahoitus users by conducting for example focus groups or user tests. In this way we could get authentic feedback on the persuasive features in the system.

After validating the prototypes with real users and improving the prototype as well as adding the missing features, a first version of the working system could be implemented. This first version of the system could be tested in real use with customers and developed then further. In this way we can see the effect of the designed persuasive features on the long-term behavior change. After all the real benefits such as improving customers' payment behavior, reducing contacts with customer service and making additional sales can only be evaluated in the long-term use of the service.

The current knowledge of the users should be strengthened as well user research should be continued. I recommend conducting more interviews to get more comprehensive insights into users' needs and wants. While gathering new knowledge of users, personas and scenarios should be kept up to date so ensure they can be integrated to the design and development process and be a valuable tool among designers, developers and stakeholders.

When taking a look at the future prospects of the whole Luottorahoitus service we can state that there are many options for development. In the Chapter 2.4 we discussed the future trends regarding online lending services. One trend mentioned was the teaming up by FinTech companies and traditional banks. This trend may still be far-fetched in Finland but maybe some day in the future Luottorahoitus could provide a financing opportunity for banks as well. This would bring Luottorahoitus customers a possibility to apply for bigger loans through Luottorahoitus services. The bigger loan amounts would be provided by the banks but Luottorahoitus would bear the risks. In this way Luottorahoitus could offer financing for larger financing needs and expend their customer base to even bigger companies. Banks would therefore get more financing opportunities through Luottorahoitus.

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Appendix A

Design principles for persuasive systems

Primary task support principles (Oinas-Kukkonen and Harjumaa, 2009):

- **Reduction** A system that reduces complex behavior into simple tasks helps users perform the target behavior, and it may increase the benefit/cost ratio of a behavior.

  Example principle: *System should reduce effort that users expend with regard to performing their target behavior.*

- **Tunneling** Using the system to guide users through a process or experience provides opportunities to persuade along the way.

  Example principle: *System should guide users in the attitude change process by providing means for action that brings them closer to the target behavior.*

- **Tailoring** Information provided by the system will be more persuasive if it is tailored to the potential needs, interests, personality, usage context, or other factors relevant to a user group.

  Example principle: *System should provide tailored information for its user groups.*

- **Personalization** A system that offers personalized content or services has a greater capability for persuasion.

  Example principle: *System should offer personalized content and services for its users.*

- **Self-monitoring** A system that keeps track of one's own performance or status supports the user in achieving goals.

  Example principle: *System should provide means for users to track their performance or status.*

- **Simulation** Systems that provide simulations can persuade by enabling users to observe immediately the link between cause and effect.

  Example principle: *System should provide means for observing the link between the cause and effect with regard to users' behavior.*

- **Rehearsal** A system providing means with which to rehearse a behavior can enable people to change their attitudes or behavior in the real world.

  Example principle: *System should provide means for rehearsing a target behavior.*

Dialog support principles (Oinas-Kukkonen and Harjumaa, 2009):

- **Praise** By offering praise, a system can make users more open to persuasion.

  Example principle: *System should use praise via words, images, symbols, or sounds as a way to provide user feedback information based on his/her behaviors.*

- **Rewards** Systems that reward target behaviors may have great persuasive powers.

  Example principle: *System should provide virtual rewards for users in order to give credit for performing the target behavior.*

- **Reminders** If a system reminds users of their target behavior, the users will more likely achieve their goals.

  Example principle: *System should remind users of their target behavior during the use of the system.*

- **Suggestion** Systems offering fitting suggestions will have greater persuasive powers.

  Example principle: *System should suggest that users carry out behaviors during the system use process.*

- **Similarity** People are more readily persuaded through systems that remind them of themselves in meaningful way.

  Example principle: *System should imitate its users in some specific way.*

- **Liking** A system that is visually attractive for its users is likely to be more persuasive.

  Example principle: *System should have a look and feel that appeals to its users.*

- **Social role** If a system adopts a social role, users will more likely use it for persuasive purposes.

  Example principle: *System should adopt a social role.*

System credibility support principles (Oinas-Kukkonen and Harjumaa, 2009):

- **Trustworthiness** A system that is viewed as trustworthy will have increased powers of persuasion.

  Example principle: *System should provide information that is truthful, fair and unbiased.*

- **Expertise** A system that is viewed as incorporating expertise will have increased powers of persuasion.

  Example principle: *System should provide information showing knowledge, experience, and competence.*

- **Surface credibility** People make initial assessments of the system credibility based on a firsthand inspection.

  Example principle: *System should have competent look and feel.*

- **Real-world feel** A system that highlights people or organization behind its content or services will have more credibility.

  Example principle: *System should provide information of the organization and/or actual people behind its content and services.*

- **Authority** A system that leverages roles of authority will have enhanced powers of persuasion.

  Example principle: *System should refer to people in the role of authority.*

- **Third-party endorsements** Third-party endorsements, especially from well-known and respected sources, boost perceptions on system credibility.

  Example principle: *System should provide endorsements from respected sources.*

- **Verifiability** Credibility perceptions will be enhanced if a system makes it easy to verify the accuracy of site content via outside sources.

  Example principle: *System should provide means to verify the accuracy of site content via outside sources.*

Ssocial support principles (Oinas-Kukkonen and Harjumaa, 2009):

- **Social learning** A person will be more motivated to perform a target behavior if (s)he can use a system to observe others performing the behavior.

  Example principle: *System should provide means to observe other users who are performing their target behaviors and to see the outcomes of their behavior.*

- **Social comparison** System users will have a greater motivation to perform the target behavior if they can compare their performance with the performance of others.

  Example principle: *System should provide means for comparing performance with the performance of other users.*

- **Normative influence** A system can leverage normative influence or peer pressure to increase the likelihood that a person will adopt a target behavior.

  Example principle: *System should provide means for gathering together people who have the same goal and make them feel norms.*

- **Social facilitation** System users are more likely to perform target behavior if they discern via the system that others are performing the behavior along with them.

  Example principle: *System should provide means for discerning other users who are performing the behavior.*

- **Cooperation** A system can motivate users to adopt a target attitude or behavior by leveraging human beings' natural drive to co-operate.

  Example principle: *System should provide means for co-operation.*

- **Competition** A system can motivate users to adopt a target attitude or behavior by leveraging human beings' natural drive to compete.

  Example principle: *System should provide means for competing with other users.*

- **Recognition** By offering public recognition for an individual or group, a system can increase the likelihood that a person/group will adopt a target behavior.

  Example principle: *System should provide public recognition for users who perform their target behavior.*

Appendix B

Customer data
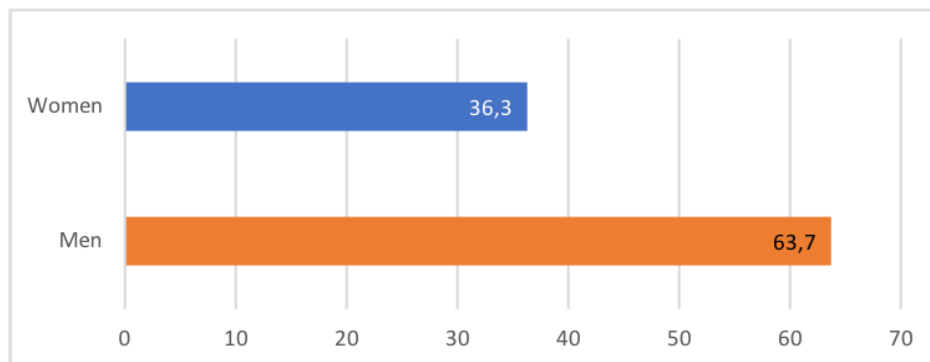
Figure B.1: Gender of customer's policy-maker (%)
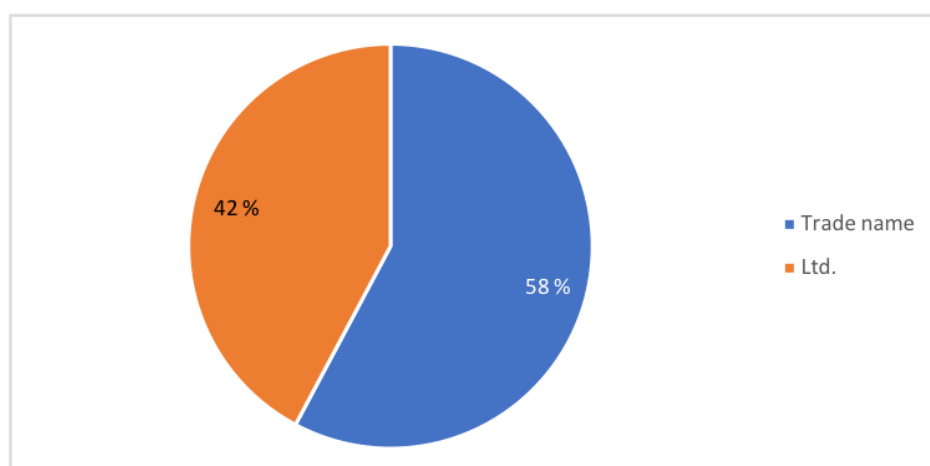
Figure B.2: Customer's corporate form (%)
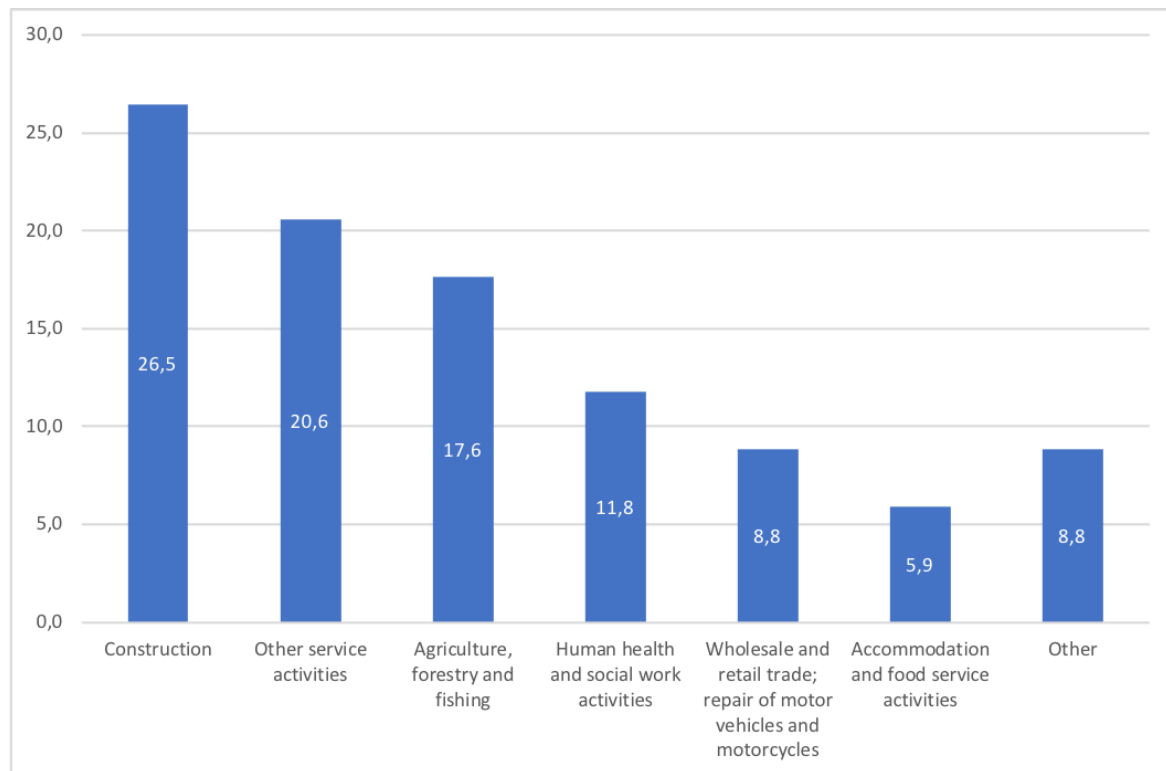
Figure B.3: Customer company's industry (%)
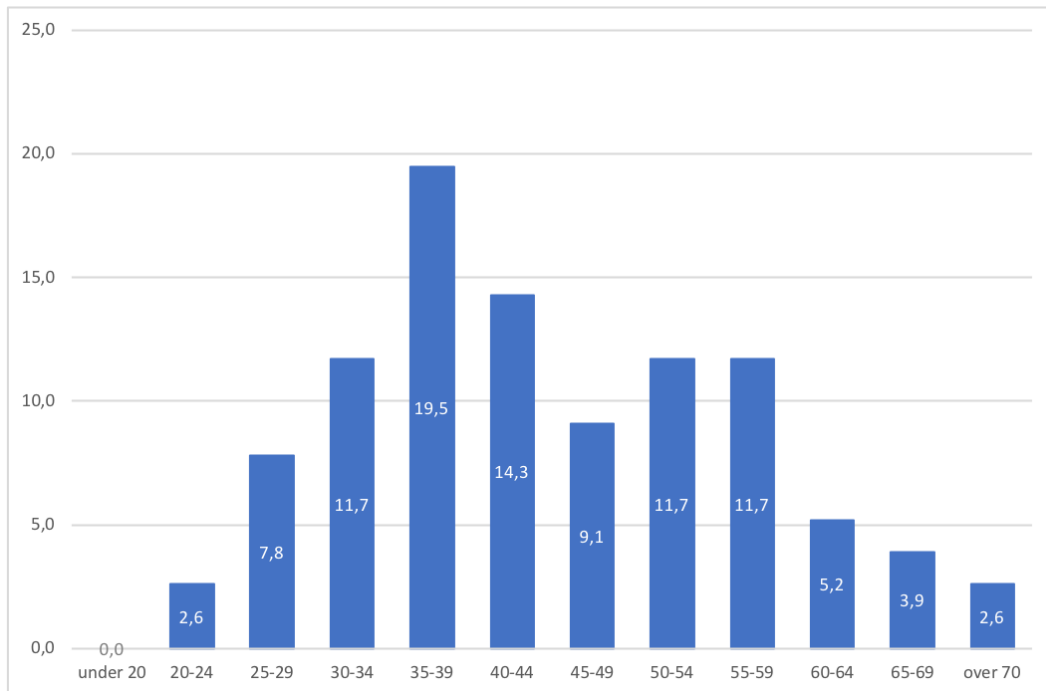
(a) Age distribution: Women (%)
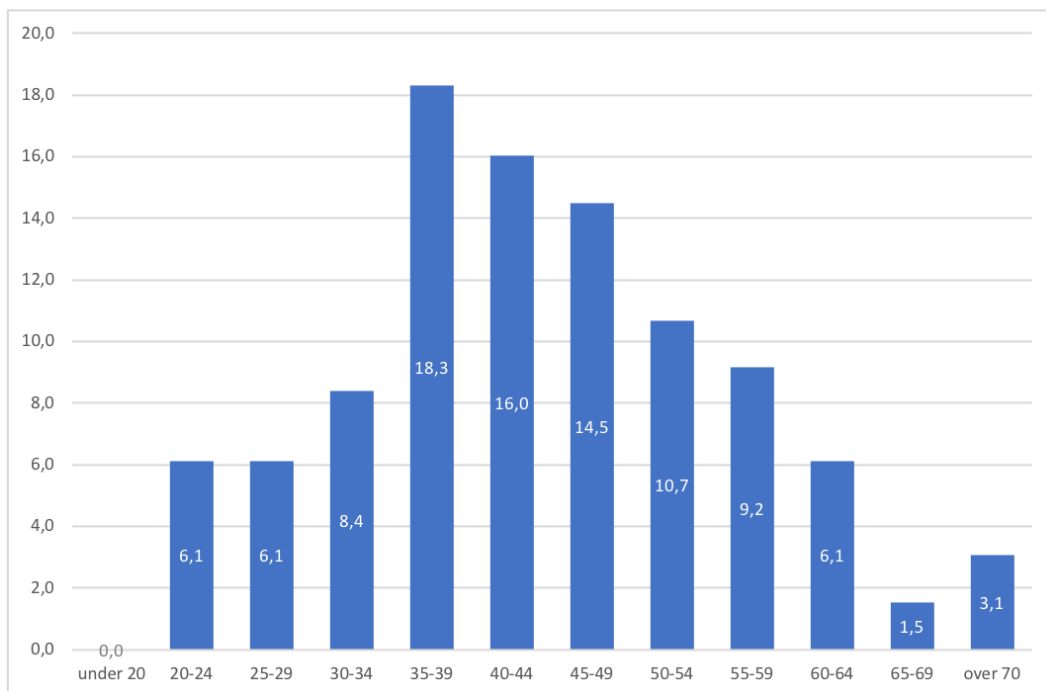
(b) Age distribution: Men (%)

Figure B.4: Age distributions of customer's policy makers
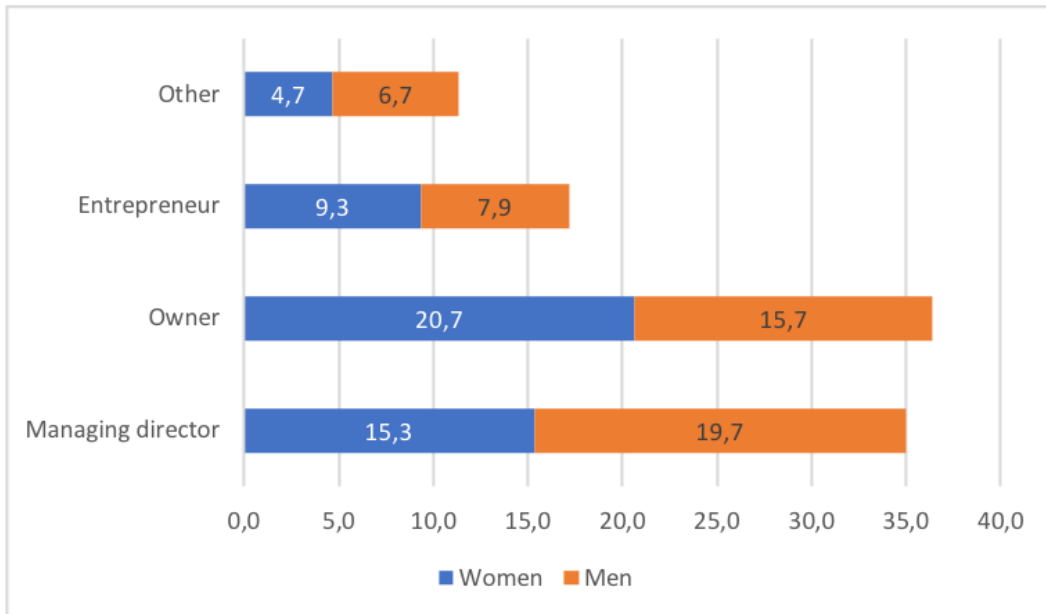
Figure B.5: Policy-maker's position in customer company (%)
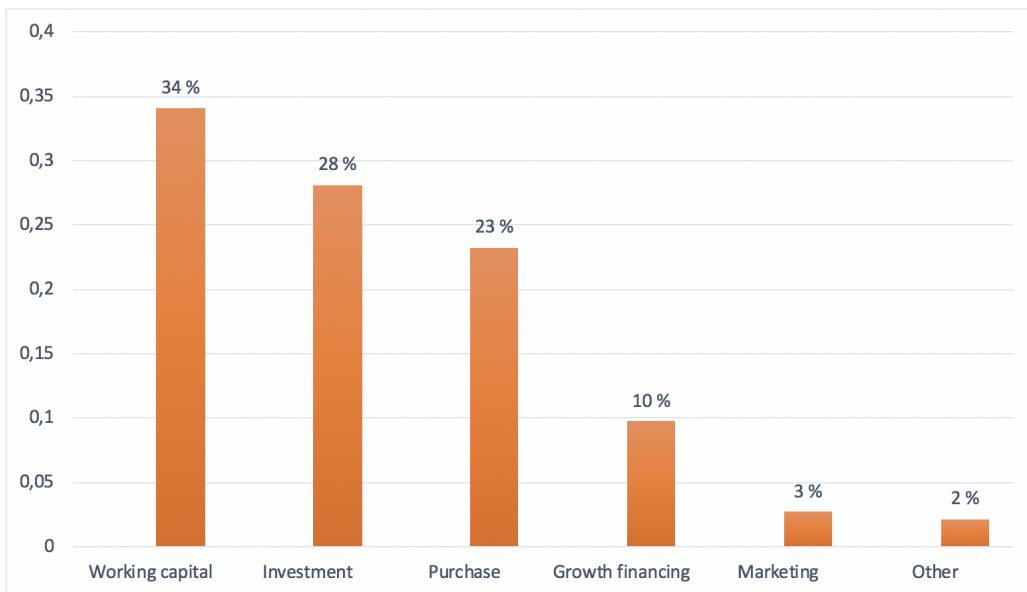
Figure B.6: Purpose for which loan is applied (%)
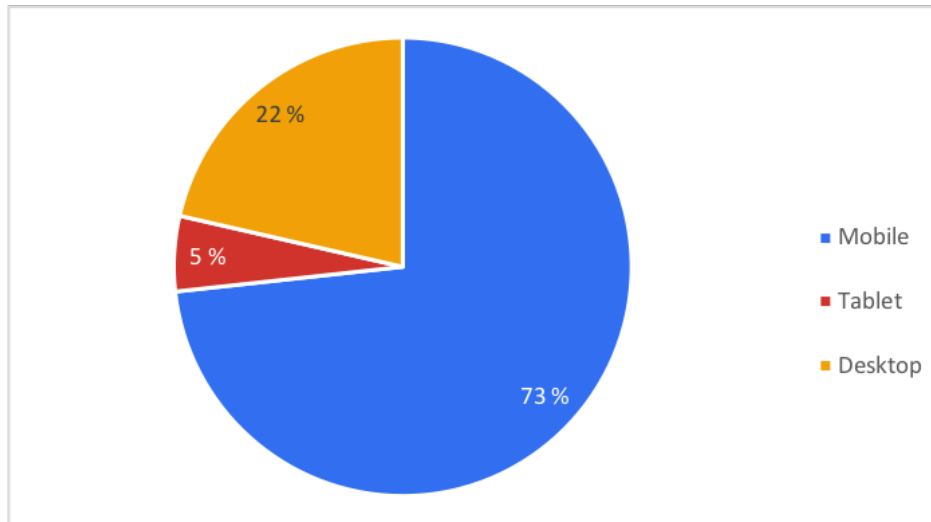
(a) Device used to enter loan application site (%)
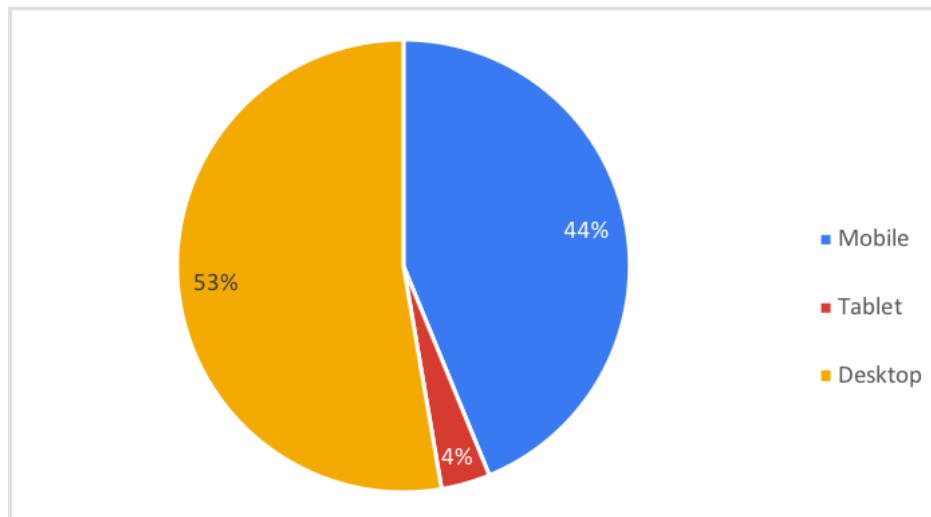
(b) Device used to submit loan application (%)

Figure B.7: Devices

Appendix C

Personas

Persona 1: Esa	
Company and Job	Managing director and owner of a three-person construction company building houses.
Demographics	55 years old - Lives in Hämeenlinna - Married, 2 children - Bachelor of Engineering - Long career in construction industry
Tasks	Leads and plans house building projects. Works at construction site and in his home office. His wife sometimes helps in paying bills and taking care of paperwork for the company.
Needs	Needs loans for investing in new machines. Also often gets paid by customers later during the construction projects and therefore needs money to buy material in advance. Works long hours and has to take care of business in the evening as well.
Technology use	Uses computer together with his wife at home office daily. Uses his smartphone several times a day for work related calls and messaging (SMS and Whatsapp), searching from Google, reading Facebook and taking care of banking issues. He prefers to use web applications on mobile and rarely downloads new applications because of the amount of memory in his phone is small.
Goals and Challenges	Aims to grow his company steadily. Aims to be always very precise and wants to pay his invoices in time. Thinks he has challenges in keeping up with accelerating technology development.
Values	Values flexible and easy to use services. Needs money quickly to his bank account when his business in concerned.
Design implications	Design the system to reward users with a good payment behavior like Esa. Reward them constantly and improve the service for Esa to make him a loyal customer. Enable users like Esa to take care of loan related issues at any time of the day not only during the business hours. Design a web app that is easy and straightforward to use and is accessible on the computer and the mobile phone for users like Esa who do not prefer mobile apps.

Figure C.1: Persona 1

Persona 2: Anne	
Company and Job	Owner of a hairdresser company. Works under a trade name.
Demographics	38 years old - Studied to the hairdresser profession - Lives in Helsinki - Single
Tasks	Opening up a new hairsalong by herself. Her daily tasks require finishing the construction work and thereafter keeping the hair salon up and running. Pays bills and takes care of the company cash flows.
Needs	Needs money for building the salon and buying new equipment and hair products. Also decides to hire seasonal workers if needed.
Technology use	Uses internet daily on her smartphone and laptop. Uses messaging apps to contact her friends. Spends some of her freetime reading blogs in the internet. Also uses some self-monitoring applications like tracking her eating habits. Usually downloads applications on mobile because thinks they are smoother to use.
Goals and Challenges	Seasonal changes in cash flows affect the company's working capital and Anne tries to pay her invoices time always when possible Did not get money from bank for her renovation because her company was new.
Values	Likes visually beautiful things and modern things. Is accurate with money issues. Values cheaper prices and discounts often when available.
Design implications	Design the application for mobile users like Anne. Design the application aesthetically appealing to provide nice interface for users like Anne. Give promotions and encourage making payments by giving promotions or rewards. Encourage Anne to pay her invoices in time whenever possible but also offer ways to pay invoices later when needed.

Figure C.2: Persona 2

Persona 3: Ville	
Company and Job	Works as an entrepreneur; importer of coffee products.
Demographics	30 years old - Graduated; studied marketing in trade school - Lives in Vantaa - Dating
Tasks	Work times and salary dependent on the transporting schedules. Needs financing for paying to seller companies in advance before getting payments from buyers.
Needs	Does business on the go so financing related issues should be accessible anywhere. Needs to be reminded of things so that he remembers to act.
Technology use	Used to computers and smart technology and uses them anywhere he goes. Has a smartphone with huge memory so used to download everything as mobile applications. Thinks that apps are good because they send you notifications.
Goals and Challenges	Has often challenges with having enough working capital in his company. This also affects his ability to pay his bills in time.
Values	Is skeptic about all the information that is collected by different services through the internet. Values security.
Design implications	Provide reminders on mobile application for users like Ville so that he can remember to pay invoices when able. Provide information for users like Ville in inconvenient situations of having problems in making payments to his invoices to cope with the issues.

Figure C.3: Persona 3
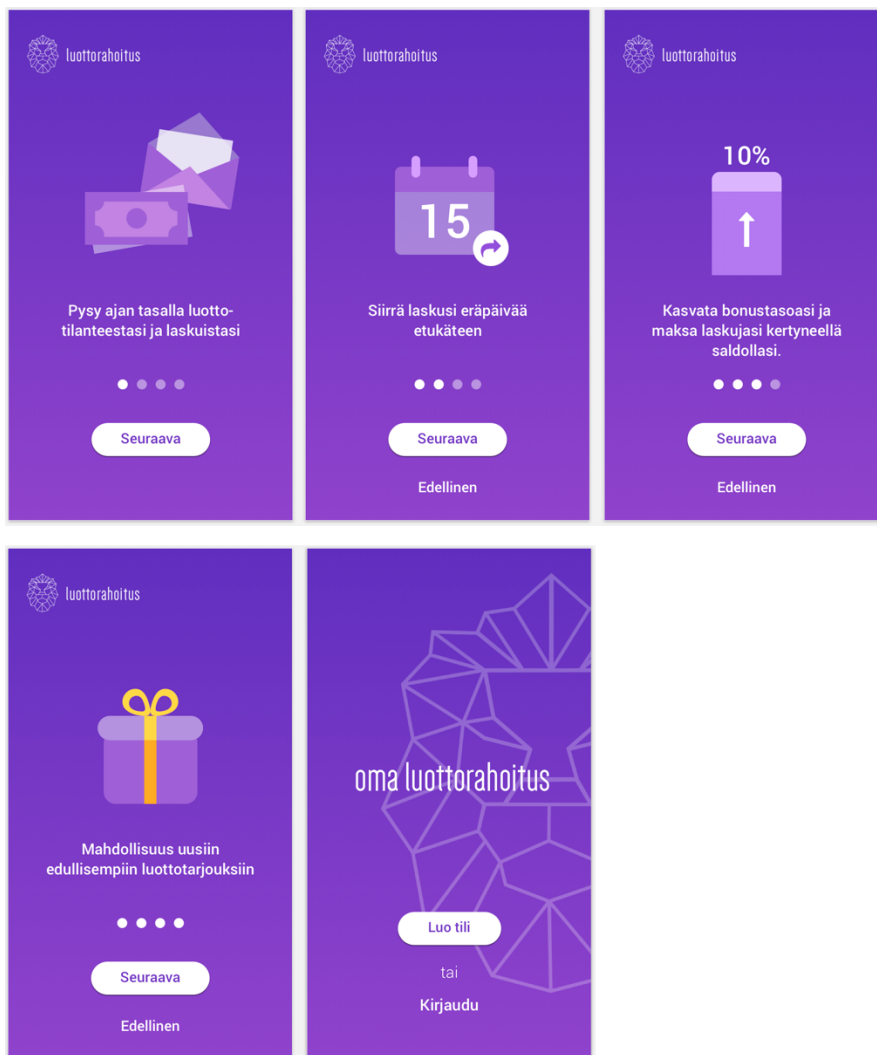
Appendix D

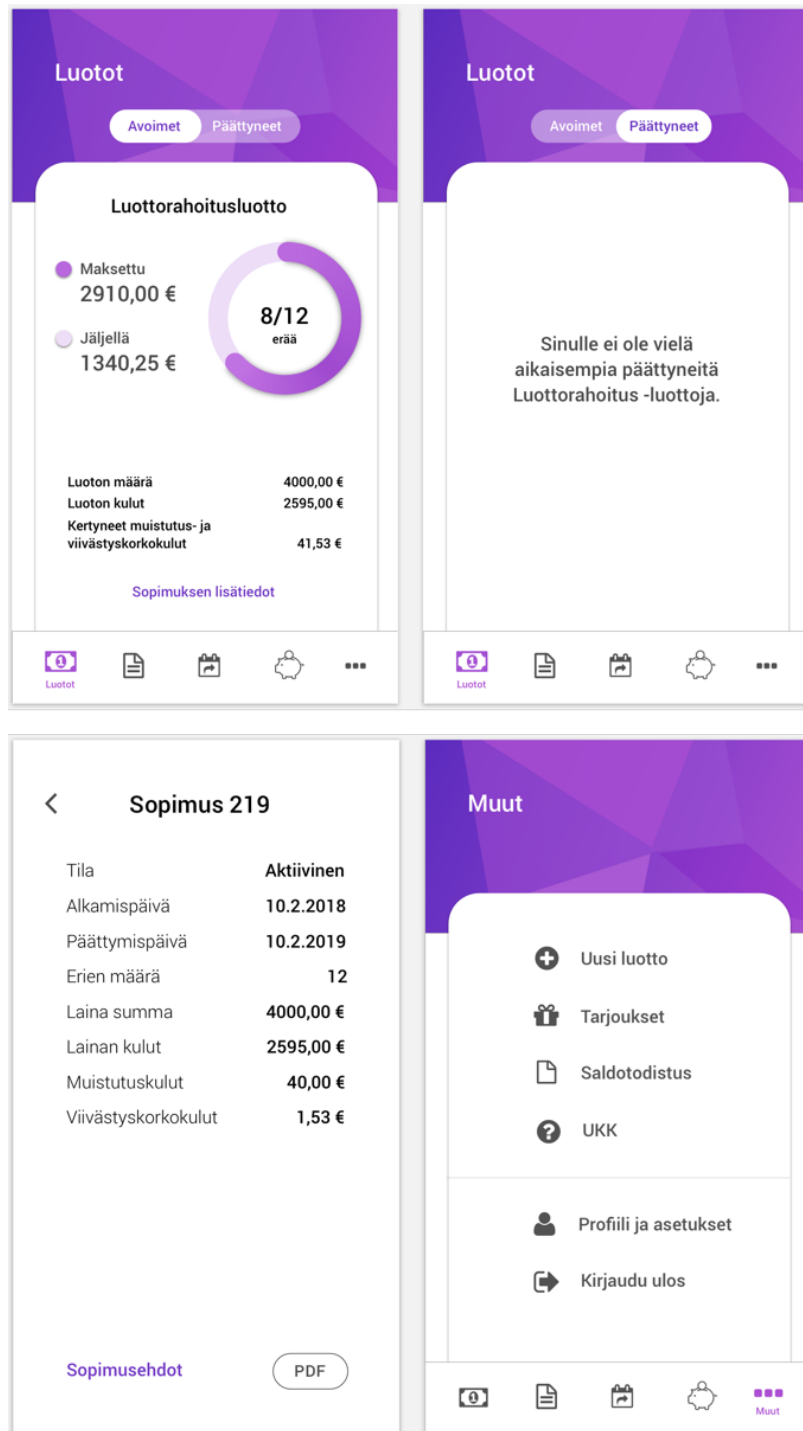# Final prototype screens

Figure D.1: Onboarding process

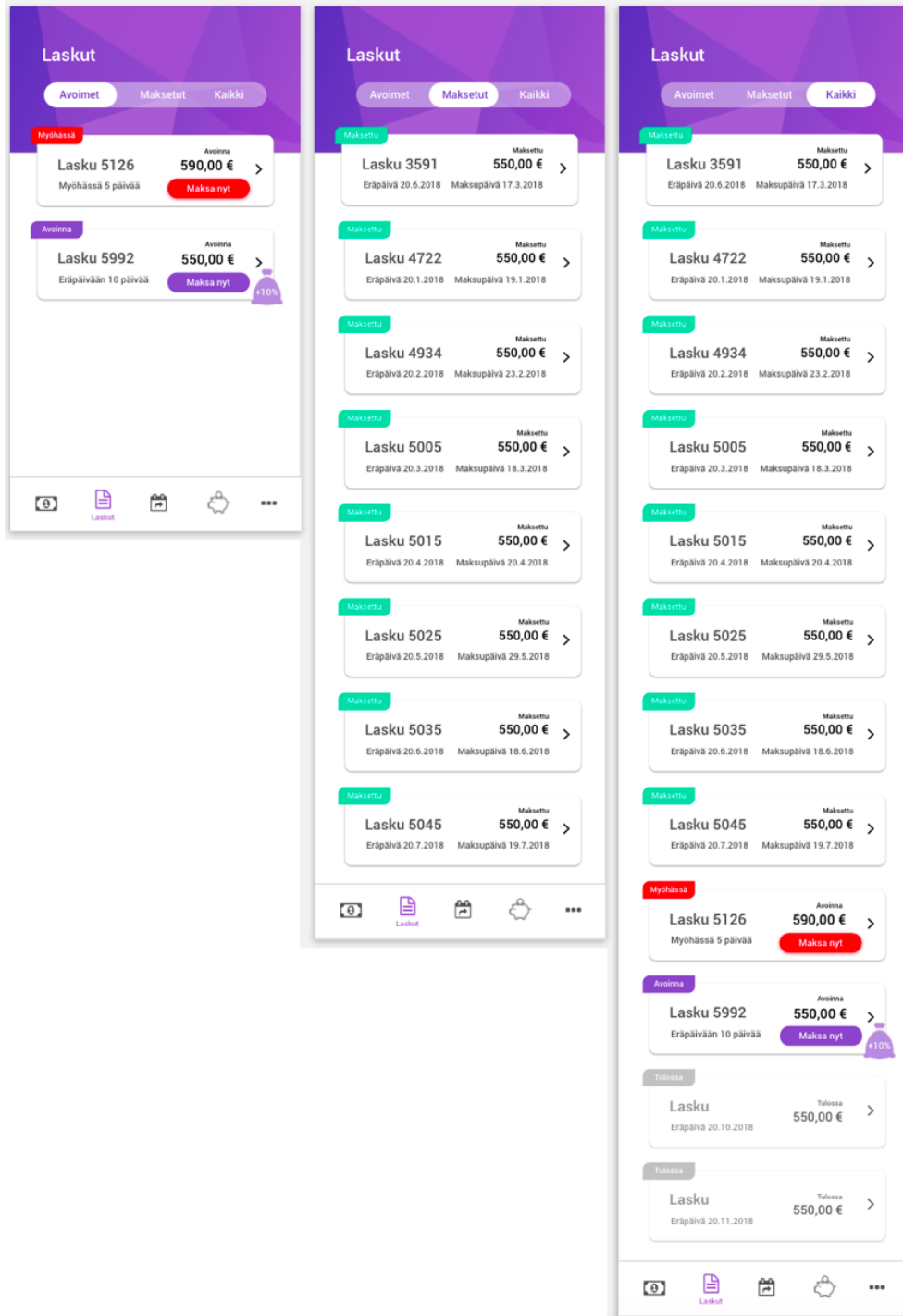Figure D.2: Loans views (open and ended), loan contract details view and "other" menu view

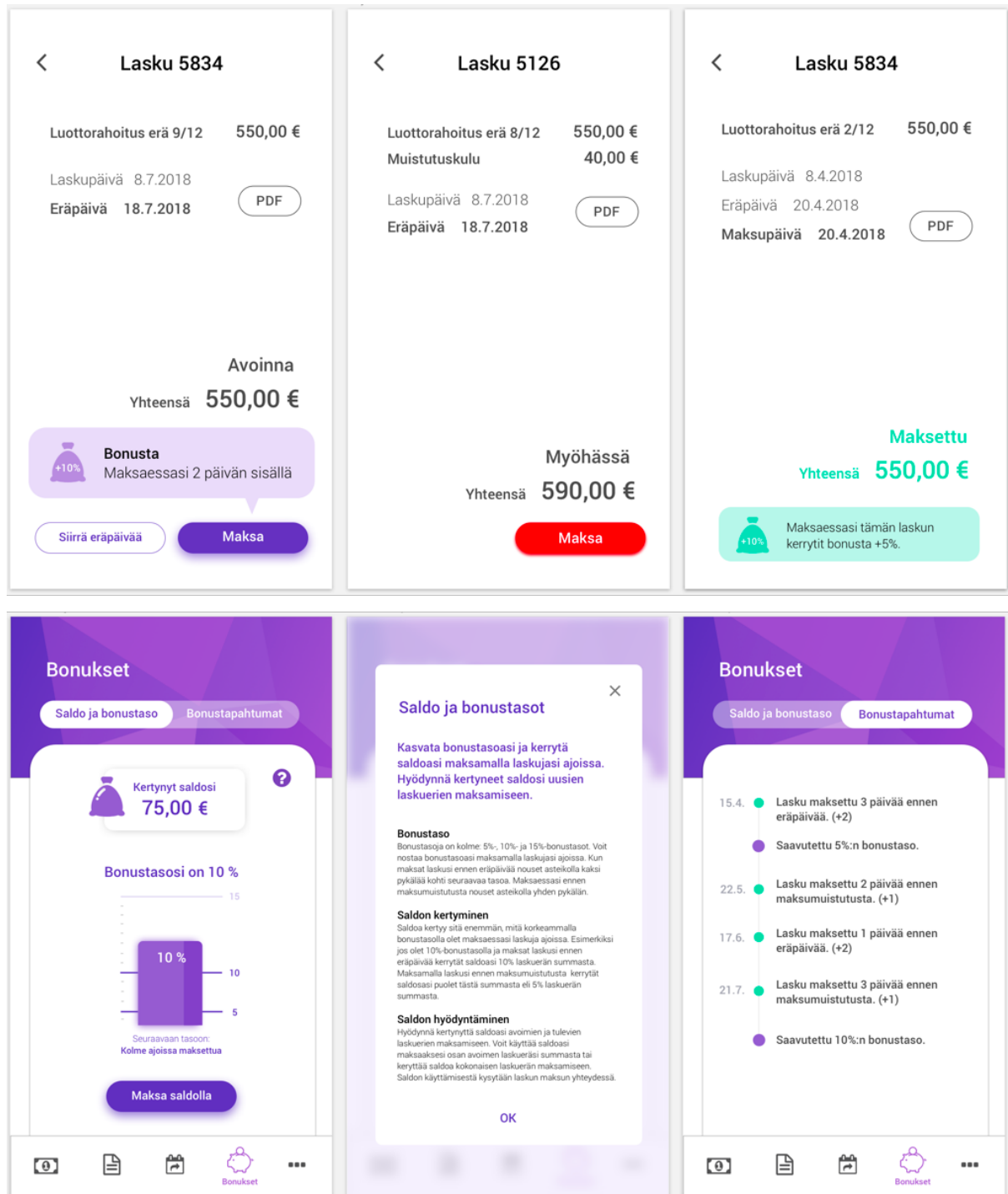Figure D.3: Open, paid and all invoices views

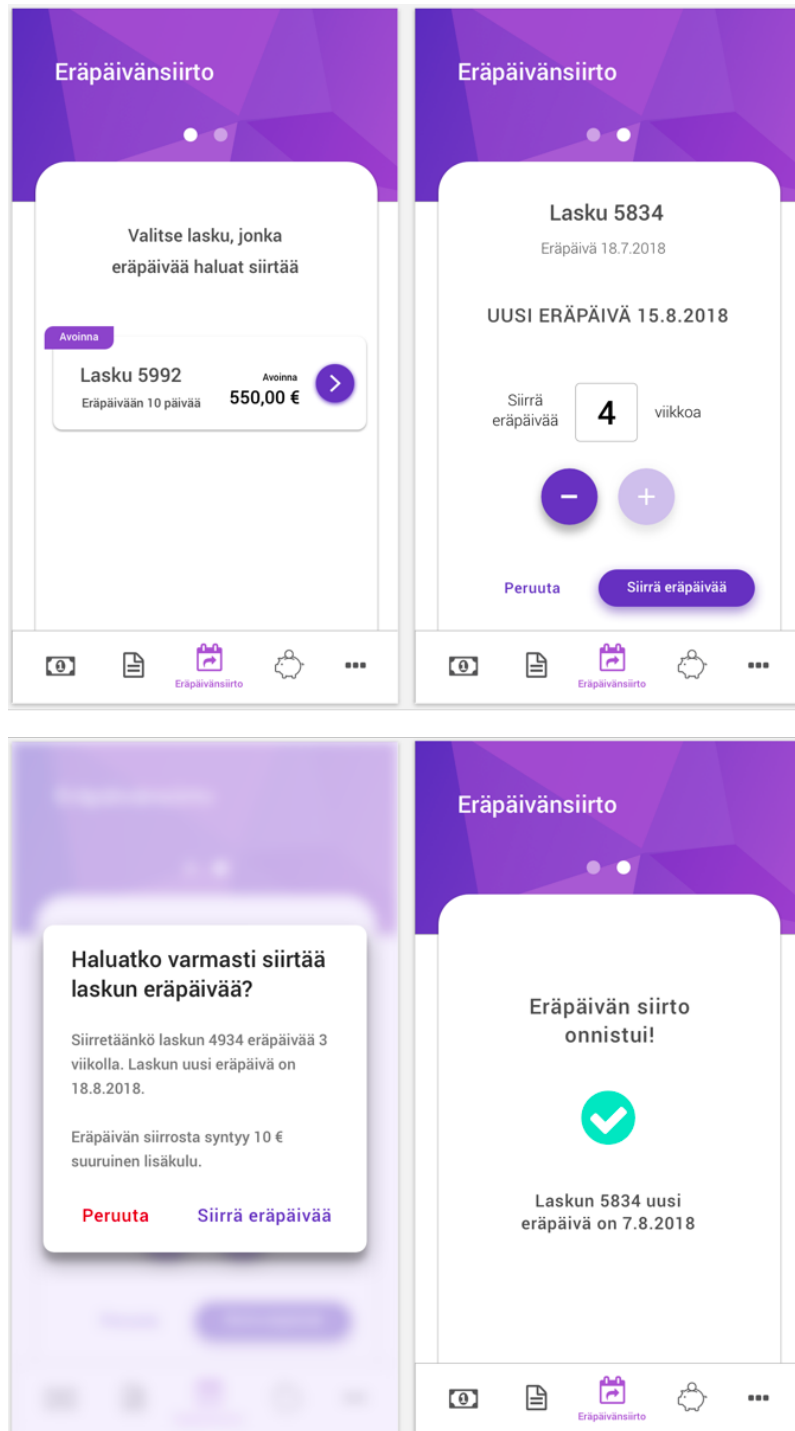Figure D.4: Open, late and paid invoice details views and bonus views

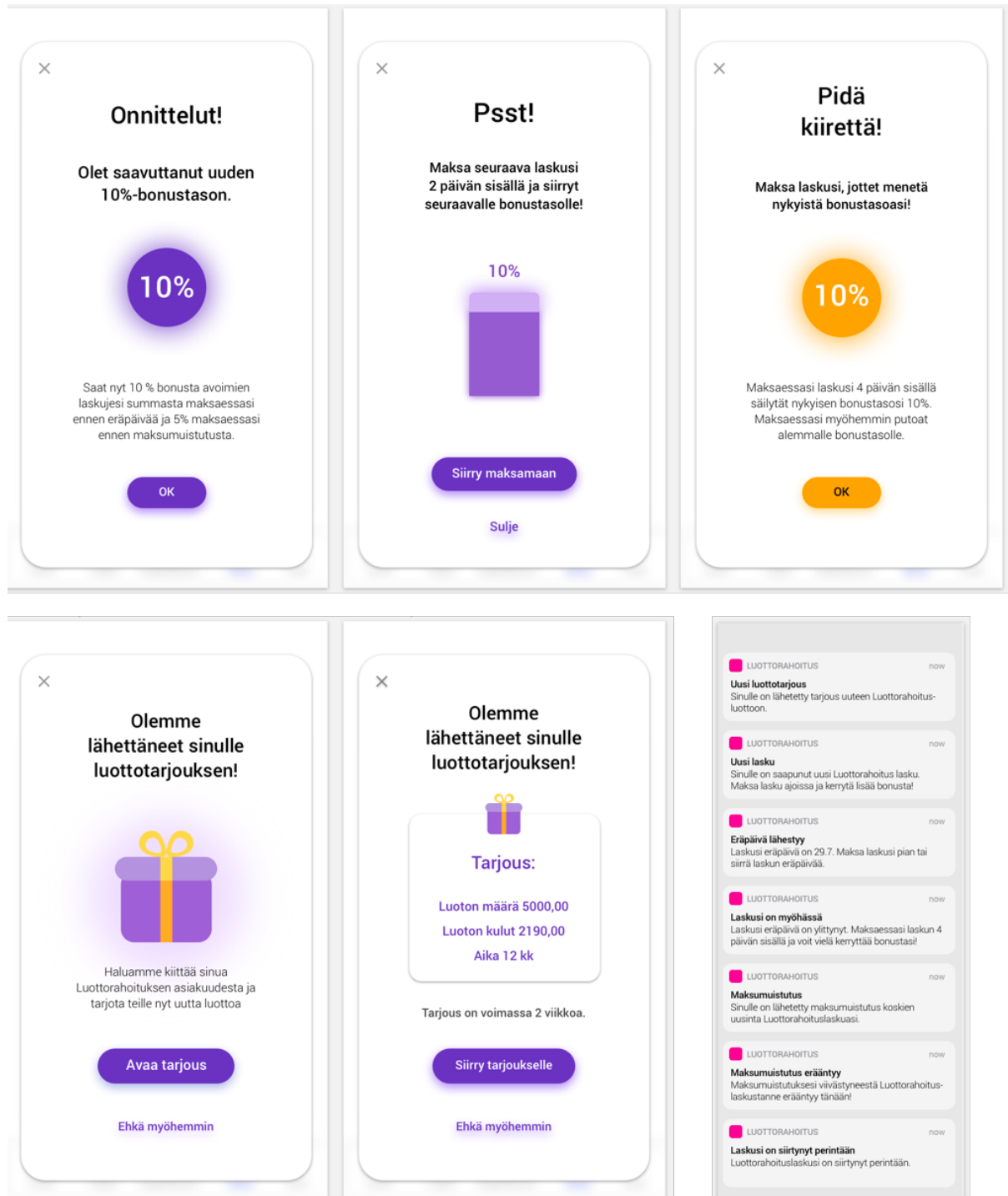Figure D.5: Postponing invoice due date views

Figure D.6: In-app suggestions and reminders, new loan offer and mobile app notifications
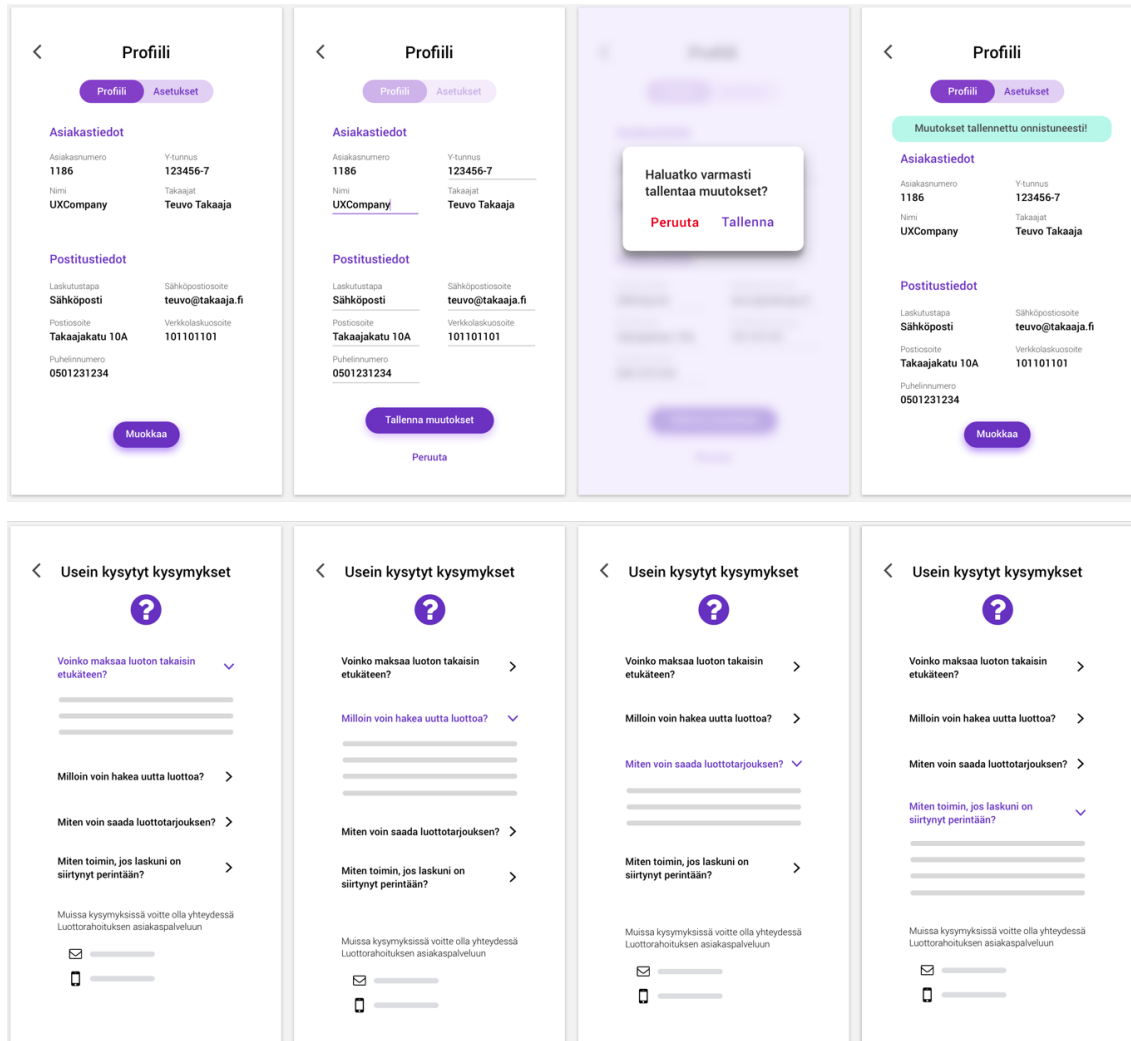
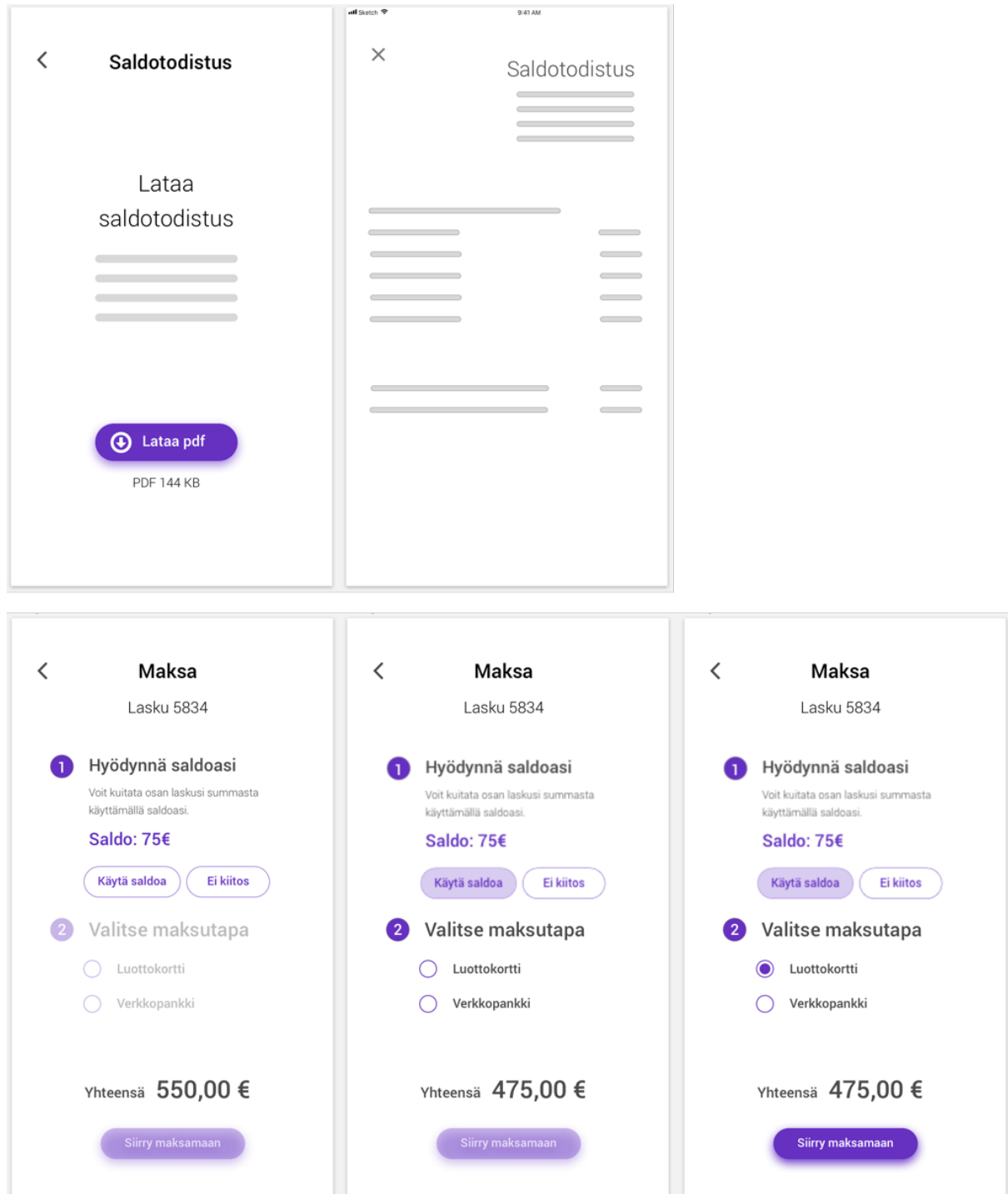Figure D.7: Company profile and editing profile views. Recently asked questions views.

Figure D.8: Downloading of balance certificate views. Paying an invoice view (accessed from invoice details view)
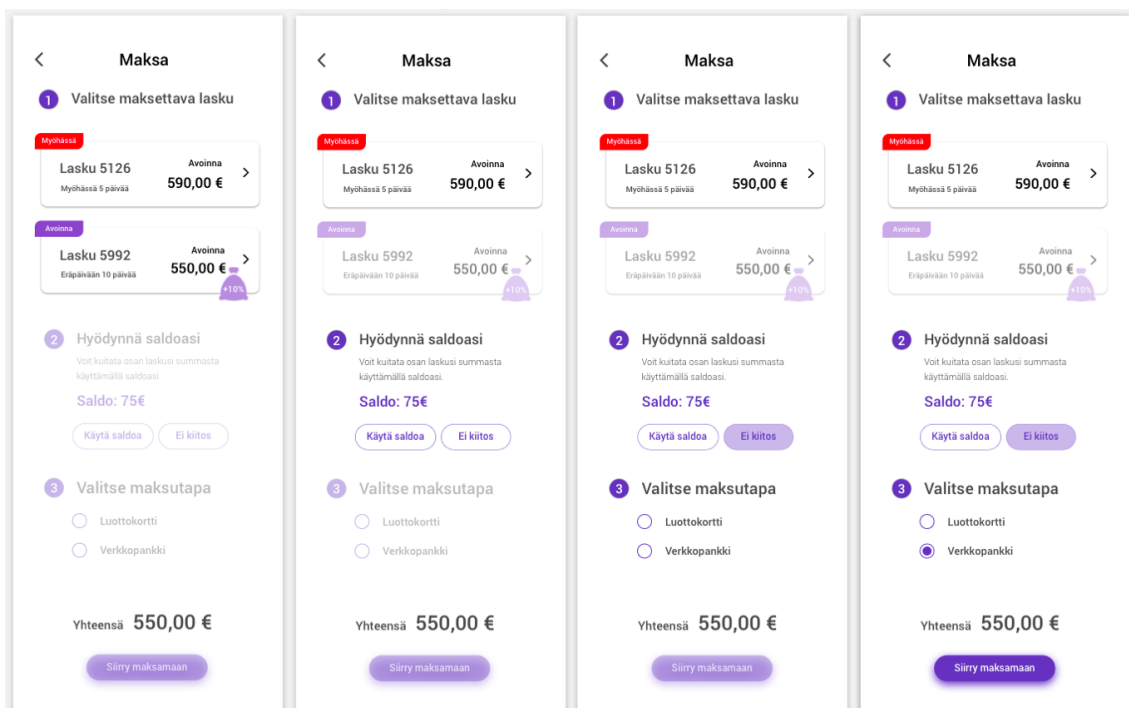
Figure D.9: Paying an invoice view (accessed from bonus view)

Appendix E

Interview questions

(Questions translated from Finnish to English)

General

- **Tell me about your company and your work?** For how long have you done this job? What is your role in the company? How is your normal working day like? What is the company size? What do you do in your free-time? Do you have hobbies or things that you like to do?

Technology

- **In what kind of things you use computer for and how often?**
- **Do you use a smart phone? Tell me about our smart phone use.** What do you do with it? How much do you use it? What applications do you use?
- **Do you have any application or web sites that you like especially?** Why do you think you like them? (informative/persuasive/visually appealing)
- **Do you play any mobile or video games?** What games? What do you thinks makes you play them?

Additional questions for active smart phone users

- Osuuspankki has a service called Pivo, which enables you to track your own money usage. For example how much you have paid for your food during the last month. **Do you use any kind of applications that you use for tracking your own behavior or progress somehow?** How do you experience this kind of systems?
- Finnair has a Finnair Plus membership that allows you to collect points and move up on tiers. The points can be used to rewards and other benefits. **Have you used any kind of systems that allows you to collect for example points, bonuses, (virtual)prices or badges? How do you experience this kind of systems?** How do you experience this kind of systems?

- **How do you feel about the fact that technologies have become so common and that everything can be done through the internet?**

Luottorahoitus user experience

- **From where did you hear about Luottorahoitus service?**
- **Why did you decide to choose to take your loan from Luottorahoitus?**
- **What it your experience of the Luottorahoitus services?**
  Is there something that is very good/inconvenient irritating?
- **How have you experienced Luottorahoitus service until now?** Something that is especially good/irritating/inconvenient?
- **What do you think about the SMS reminders that Luottorahoitus sends to you?**
- **How do you experience the pricing of Luottorahoitus?**
- **What are the factors that affect your loan taking decision?** What would make you to take a loan from the same provider again?

Appendix F

Test tasks

(Tasks translated from Finnish to English)

1. Your company has been granted with a Luottorahoitus loan. You have access to the Luottorahoitus mobile application. Log in to the app and check how many installments and what sum is currently unpaid. The password for the log in is 0000.

2. The due date of your latest Luottorahoitus invoice is tomorrow. However you can not pay the invoice until 3 weeks. Do the required actions to get more payment time for your latest invoice.

3. You find an paper invoice on your table with the number 4004. Check if you have already paid this invoice.

4. Your company is making the financial settlement and you need a balance certificate. Do the required actions for getting a certificate.