Collaborative consumption: exploring new ways to enhance the exchange phase of C2C marketplace apps

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Abstract

The customers of C2C marketplaces are often unsuccessful at completing transactions due to several issues that arise during the exchange phase. At the time, customers are left without the tools to aid them in dealing with ambiguous agreements and absenteeism at the time of exchange.

My contribution with a prototype with added features to already existing C2C online marketplace applications, has the goal of exploring new methods which can reduce friction and hassle during the exchange phase of the transactions. However, as the results showed, the prototype didn't contribute to reduce the issues in the exchange phase of the C2C online marketplace applications. This doesn't mean that the added features weren't good enough. The main reason for the lacking of improving results were that the participants of the master thesis actually did not use the added features.

This show in a way that in spite of huge innovation in C2C online marketplace applications the past decades, there is still more need for research towards the mechanisms that are actually used by customers.

Preface

I would like to thank all my friends and family, my excellent supportive supervisor and last but not least my incredible girlfriend which have supported me through the entire thesis.

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Abbreviations

CC:	Collaborative Consumption
B2C:	Business to Customer
C2C:	Customer to Customer
CJML:	Customer Journey Modelling Language
MAD:	Mode Absolute Devation
SMEQ:	Subjective Mental Effort Questionnaire

Introduction

The goal of this thesis is to investigate whether new app functionality can reduce hassle and friction during the exchange phase of C2C marketplace transactions. That is, the phase in which goods are exchanged for money. Sintef has identified that hassle and friction during the exchange phase hinders the adoption of C2C marketplace apps. Therefore, it is of interest to explore new methods to facilitate the users in this phase. My contribution with this thesis has been to develop a fully functional prototype as well as testing the features I implemented based on a Living Lab study done by Sintef. The results from the study constitutes a new cornerstone in the rather spare research field of C2C online marketplace design.

Background

The rise of collaborative consumption justifies the pursuit of more research towards the mechanisms that plays a role in on online marketplaces. Collaborative consumption is a phenomena that have been gaining a lot of attention since the surge of new technological services such as Ebay, Alibaba, Zipcar, Finn.no Torget and Nabobil to name a few. These companies provides new ways of renting, lending, swapping, sharing, bartering and gifting (Botsman, 2015). Modern online marketplaces falls within the term collaborative consumption. We will see that even though the marketplaces have gone through incredible transformations, consumers still face hassle and friction during the exchange phase when using these marketplace services. This chapter will discuss the implications of the sharing economy on online marketplaces, explore relevant terminology and introduce some terms relevant for the thesis. Furthermore, the background chapter and thesis scopes in on the exchange phase of online marketplace transactions, more precisely, the phase where goods are handed over for money.

The exchange phase has throughout the history been straddled with hassle and friction. For instance, a hundred years ago, you might have had to travel to another town by horse and cart to handover some good for another that you were looking for. Then there were classified ads distributed through the newspaper, but many of the same issues remained, you would still have to arrange transport and find a means of communicating. During the last twenty years, the world wide web has grown increasingly accessible and nowadays “almost everyone” owns their own cell phone with internet access. This means

that almost everyone has access to online marketplaces, which in turn allows for the expansion of the sharing economy.

Nevertheless, many of the same problems during the exchange phase still applies to the modern online marketplaces. Issues that may arise during trading on the online marketplaces include, but are not limited to: agreeing to who should deliver or pick up the goods, when is a deal is actually made, unknown conditions that appear after the deal have been made or how to pay for the goods. However, many of these issues can be mitigated with technology-supported modern marketplace applications. Some of the issues, such as how to pay for the goods have already been improved by novel technology, for instance, many marketplaces have implemented various payment solutions available to the customers.

At the same time, technology is moving fast, and hopefully, the usage of technology will also be able to drive these marketplace services even further and deliver solutions that will ease the exchange phase for the customers involved in the sharing economy.

Sharing economy

The sharing economy is said to be huge, and it is growing even more with the introduction of novel services that fall within this category. There is an ongoing debate about how to define sharing economy. The following definition will be used in this chapter; sharing economy is: ”an economic system based on sharing underused assets or services, for free or for a fee, directly from individuals.” (Botsman, 2015). Imagine a household car, the car is used by the owner and family at most, resulting in the car being used less than 5% of it’s lifetime (Yaraghi

et al, 2016). A novel service that falls within the sharing economy, Nabobil, lets the owner of a car rent out their car so that it can be used by anyone nearby for a small amount of money. The car is used more efficiently as it's idling time is reduced and the owner is paid as well, adding incentive to use the service to lend out the car.

The sharing economy is on the rise. The impact on world economy has increased very much the last years, and it is continuing to grow (Yaraghi et al, 2016). This implies that more and more people are impacted by the sharing economy, and many are participating even if they don't know it. The growth means that more people will be impacted by the sharing economy and incorporate it into their lives. This also leads to more people using services and products that fall in the sharing economy category, which also implies that is even more beneficial to improve these services and products.

Today, many of the most influential companies and services that drive the sharing economy forwards are technology-supported. These companies include room rental service AirBnB and Cohealo. The latter is a service for lending out health care equipment with a lot of "idle time". Both services have in common that they are made possible by the help of technology. Therefore, it may be highly beneficial to invest in the use of new technologically supported methods to aid the users of these services. One of the main reasons to focus on technologically supported methods is that the technological advancements have been moving so fast in comparison to other areas relevant to the businesses and services. This leaves a gap which is possible to explore and fill with new methods adding to these services.

Collaborative consumption

Collaborative consumption can be described as “sharing reinvented through technology” (Botsman, 2011). The term surpasses that of sharing economy in that it focuses on the reinvention of traditional market behaviors. Trading, swapping, gifting, lending, renting and giving are some traditional activities that have been re-invented through technology. There are new services that make these activities scalable across geographical barriers, and the services also change how we consume them. Notable examples include Peer-2-Peer lending company Zopa, car renting service ZipCar and marketplaces such as eBay and Finn.no Torget.

There are two main types of collaborative consumption, product-service systems and redistribution markets (Botsman, 2011). The difference between them is that the former is a peer to peer based monetized exchange for temporary access to goods, whereas the latter is based on used or pre-owned goods being redistributed to new owner, often in exchange for money. Services such as Ebay and Finn.no Torget belong to the redistribution markets category.

Researchers agree there is an overlap between aforementioned terms: collaborative consumption, sharing economy and other terms such as collaborative economy (Stokes et al, 2014), peer-to-peer sharing (Teubner et al, 2016), access-based consumption (Bardhi & Eckhardt, 2012) and on-demand services (Botsman, 2015). Regardless, this is not an inquiry to label these services correctly to the different terms and categories. Instead, this chapter merely tries to position marketplaces such as eBay and more importantly Finn.no Torget within the realm of collaborative consumption.

Knowledge-making in the field of collaborative consumption is warranted because it advances service design and promotes innovation in one of the most

forefront economies in today's society. Technology lets the services scale globally so that they can tap into new markets that formerly were unreachable without the support of technology. Imagine trading second hand goods, the services as we know them, such as Finn.no Torget, would not be able to exist without technology which helps sharing classified ads in an easy manner. The forerunner to online classified ads would be the classified ads in the newspaper. However the costs associated with putting the advertisement in the paper and the time spent looking for what you need, does really limit what kind of items will be available there. With the support of technology, it is easier than ever to search large databases of items, display your items for sale and the costs associated with selling items are lower than ever. Another advantage with modern classified ads are for example that more items are available for second hand purchase because of the ease of publishing ads and the low costs. In addition, you may simply grab your mobile phone and browse anywhere during your leisure time, on a bus or comfortably from your home.

Furthermore, collaborative consumption is an important phenomenon because of the services that are reinvented by technology and look at the common features shared between them. This is interesting because these services are consumed in another fashion than they were previously and technology will likely be the driver in the furthermore evolution of these services. An interesting topic to look into with regards to the issues described above is the use of technology to aid the consumers of services such as C2C marketplaces.

Consumer-to-consumer marketplaces

Services such as eBay and Finn.no Torget are C2C online marketplaces that delivers their services to consumers worldwide. More examples that are serving consumers specifically in Norway are Shpock, Letgo, Tise and even facebook

trading groups. These services are as earlier mentioned, redistribution markets, which means that they are facilitating the movement of unwanted or idling goods to new consumers. The result is goods that are less idle so that they may be enjoyed by more people than solely the initial purchaser.

The following definition describes the services and gives a short understanding of the C2C marketplace domain.

> "Customer to customer (C2C) is a business model that facilitates an environment, usually online, where customers can trade with each other. Two implementations of C2C markets are auctions and classifieds. C2C marketing has soared in popularity with the arrival of the internet, as companies such as eBay and Craigslist have fostered greater interaction between customers." (Investopedia.com)

The Norwegian marketplace services described above have in common that they belong to the classified ads category. These marketplaces lets their customers create and publish classified ads, and then they make these available for other customers to search and browse. Furthermore, all of these services share the fact that they deliver both a mobile experience and a browser experience with the exception of Tise which is only available as an app. Interestingly, Tise does not provide any in-browser experience, which may be partly because it is a social commerce service, adding social network features to the trading platform and because the service developed by a quite young start up company with a special vision. Nevertheless, this thesis focuses primarily on "Finn.no Torget" as it is the leading online marketplace in Norway as of January 2018 (TNS Gallup, n.d.).

As mentioned, these marketplaces have challenges and issues with the hassle and friction experienced by consumers during the exchange phase, and as a result the

consumers are hindered when trying to achieve what they want to achieve, namely selling and buying goods. For instance, the seller's description of the item may be incorrect, or the buyer may have different standards and or expectations to conditions of the item. Both of the parties might expect the other party to come to their doorstep to handover the goods, or vice versa.

Both buyers and sellers alike, may experience hassle and friction when they are trying to sell or buy second hand goods online. This is especially occur in the exchange phase of a transaction, where the seller hands over the goods to the buyer in exchange for payment of some sorts. To be able to effectively work within the domain of C2C online marketplaces, I have conducted an explorative literature search to investigate whether or not these terms have been mentioned in the existing literature.

Literature review

To explore the domain of collaborative consumption, especially related to online marketplaces, I have done a literature search that is of exploratory nature. By doing a literature search I wanted to discover any relevant definitions or models that could be interesting to build my work upon or include in my work. Particularly, I have looked for definitions or models on the phase where the exchange of goods takes place. Thus, I searched for any definitions or models that could serve as a starting point for further research and discussion of the phenomena hassle within C2C electronic marketplaces.

Methods

The search was done on the following online libraries: "Google search", "Google Scholar search", "Scopus", "UiO Oria" and "ResearchGate". These are services that

cover a large variety of available peer-reviewed articles. In addition I followed the references in the articles i found to expand the search even further. The most promising keywords that were used to do the search are “collaborative consumption”, “c2c”, “e-commerce”, ”electronic marketplace”, “stages”, “handover of goods”, “exchange phase”, “touchpoints”, and “friction”. The other keywords that were used to search broader, but did not contribute to the results were: “process”, “marketplace”, “commerce”, “consumer”, “phases”, “models”. Most of the keywords were used in different combinations to filter down the amount of results and find the most relevant articles.

Results

The relevant articles found during the literature search shows that the amount of scientific material on the topic of hassle and friction during the exchange phase is rather sparse. For instance, there seems to be no articles that discusses or goes in depth on the description of the exchange phase in relation to marketplace applications. Neither did I find any articles on the topic of hassle during handover or handover of goods whatsoever. Thus, to the best of my knowledge, the topic of hassle or friction during the exchange phase in C2C marketplaces has so far not been considered in literature. Instead, the articles that are prevalent among the increasing amount of research on C2C electronic marketplaces are on the impact of trust in these marketplaces (Meents & Verhagen, 2008), (Chen et al, 2007), (Lu et al, 2010), (Xinyan et al, 2010).

Thus, the findings of the literature search were not very promising; however, Zhang has written a review article about consumer behavior in social commerce (Zhang et al, 2016). In this article he uses the five-stage consumer decision-making process model from the classic book *Consumer Behavior* (Engel et al, 1973). The model, also shown below, consists of stages that may be

beneficial to build upon because they describe the different stages that are part of a marketplace transaction. These stages are the following; “need recognition”, “search”, “evaluation”, “purchase” and “post-purchase”. Of these five stages, the “purchase” stage is interesting because a purchase depicts an transaction or exchange.

Fig. 1: Five-stage consumer decision making process model

Engel’s “five-stage consumer decision making process model” is a promising starting point because of its similarities to the stages in a C2C marketplace transaction. However the various processes within the stages does not precisely resemble those of which consumers of C2C marketplace services are going through (Engel, 1973). The model were made with B2C transactions in mind, while the similar stages in C2C transactions contain slightly different processes. Customers may also show different behavior when dealing with other customers instead of businesses, this needs to be clarified further. Nevertheless, the model provides a starting point.

During another search for similar models to Engel’s I discovered a more detailed model by Xinyan (Xinyan, 2010). Xinyan’s model consists of eight stages which try to accurately capture the phases of the marketplace transactions with regards to perceived risk in these stages (Xinyan, 2010). The eight stages are namely: “the items for login”, “the items for sale”, “end-confirmation”, “settlement-collection”, “delivery-receiving”, “return-evaluation”, “accounting-cashing” and “the phase indirectly related to the deals”. This model, contrary to Engel’s model, tries to granularize the “purchase”-stage into more detailed stages. This model is more

relevant because of the fact that it is more aligned to the phases of a marketplace transactions rather than B2C transactions. A weakness in Xinyan's paper is that it does not define the boundaries between the different stages. The boundaries are important as they are needed to be able to clearly define in which part of the stage hassle and friction arise. Thus Xinyan's paper is not much more useful than Engel's model. Furthermore, Xinyan's speaks of the stage: "the phase indirectly related to the deals". The stage seems like a weak attempt at tying up any loose ends in his model. It is hard to justify the use of a model which neither proves its usefulness nor accurately depicts a C2C marketplace exchange.

Thus, none of the two models can be directly used to satisfy the need for a model of the exchange phase. However, they do have some relevance and Xinyan's model seems to be the most fitting. The terms "transaction", "stages" and "exchange phase" have been mentioned in literature, but they have mostly been used to put other research into context, such as evaluating trust in the different stages (Xinyan, 2010). In addition, the term "exchange phase" appears in Xinyan's model under another term, "delivery-receiving". These findings reveals that scientific community is missing a shared term for the phenomena of exchanging goods for money. Therefore, there is a possibility that more promising models have been missed in this search because the search may have missed out relevant terms to describe the phenomena.

Finally, the search yielded a relevant article which speaks about exchange of goods in exchange for payment in a C2C-marketplace setting. First, Meents and Verhagen states that consumers using C2C-marketplaces engage in transactions. Then, the paper state that these transactions consists of multiple phases (Meents & Verhagen, 2008). The paper does not go into detail on what these phases are, however it speaks of the exchange as one of these phases. Hence the word exchange phase have been used in the literature before and may be a good term

to use when continuing further research. Furthermore, multiple papers use the term *transaction* to describe a full quantifiable transaction instead of the term *exchange* (Meents & Verhagen, 2008), (Chen et al, 2007), (Lu et al, 2010), (Xinyan et al, 2010). Therefore, the literature also indicates that the exchange phase may rather be seen as a part of a transaction.

Term definitions

Throughout this paper I am mentioning several terms that have a specific meaning within the context of C2C online marketplaces. Clear and concise definitions for these terms are needed to work with the processes and services in C2C marketplaces. As the literature is, to the best of my knowledge, lacking a shared definition of these phenomena, I propose some definitions specific to this paper for the terms that are used throughout this paper.

Listing

A listing in the context of this thesis is a form of advertisement that is user created by customers participating on C2C online marketplaces. It is synonymous to “ad”, “classified” and “classified ad”.

Transaction

I define a transaction as a quantifiable entity consisting of the phases depicted within the blue rectangle in figure below. It is difficult to establish the beginning phase of a transaction, but a transaction generally begins with a purchase intent. Nevertheless, this thesis is focusing strictly on the exchange phase of a transaction and further specifications of phases 1 to n are omitted as they are not important to discuss the findings in this paper.

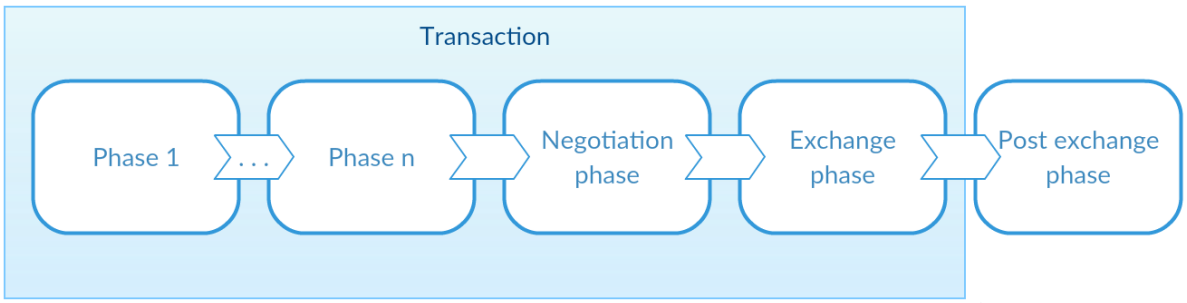


Figure 2: Overview of a typical transaction in C2C marketplace applications

Furthermore, a transaction has two outcomes, either it is fulfilled, or it is unfulfilled. A transaction may fail during any of these phases. Sintef has identified that many of the transactions on C2C marketplaces fail during the exchange phase (Følstad, 2017).

To be able to identify why these transactions fail, it is helpful to have an overview of what a transaction consists of and where the exchange phase resides in it. More importantly is scoping in on what the exchange phase is, which elements it contains, where it starts and where it ends. These defined boundaries will serve are used to confine and scope the work in the remainder of this paper.

Also, it is important to clarify what is meant by the terms “transaction” and “exchange phase”, as to find a mutual understanding of the definitions for this and further research. To further clarify some of the terms, they are described and discussed in the points below.

Exchange phase

When conducting transactions in C2C marketplaces, the consumer will eventually at some time have to exchange the goods for payment or vice versa, depending on whether he or she is the seller or buyer. This particular step constitutes the exchange phase and it is the phase that is of primary concern to this paper.

The exchange phase, is as such, the crucial period in which the two parties of a transaction communicate purchase intent, discuss practical details regarding the exchange and finally physically meet to hand over the goods in exchange for payment.

However, the two parties of a transaction do sometimes fail to reach mutual agreement. In addition, they also have different understandings of the agreement and so forth. As a consequence, I propose there is a need to define when the exchange phase starts and, in addition, also discuss the matter of when a deal actually is made.

To clarify further, the exchange phase *begins* when one of the two parties of the transaction proceeds to close the deal. However, that is under the presumption that there has been two-way communication during the phase of “negotiation”. One could argue that the exchange phase starts when both parties have stated that they have a deal, but even then, the terms of the deal may be diffuse. Furthermore, negotiation could also happen after the exchange phase has begun. Thus, the phases may in some circumstances overlap. Also, transactions may be fulfilled even with the absence of a deal. Nevertheless, the exchange phase generally begins when a participant of the transaction proceeds to communicate the facilitation of the exchange.

On the other hand, the *end* of the exchange phase is defined as when goods have arrived in the buyer's possession, and the payment have arrived in the hands of the seller. The transaction is considered fulfilled when this has occurred.

This proposed definition of the exchange phase serves to provide a description of the phases of a transaction that this paper revolves around. In addition, the definition of the beginning and the end of the exchange phase serves as a boundaries used to build objective measures for the data collection and analysis of this paper. As a result, the definitions are necessary for others to verify the data collected and they allow others to replicate the findings of this paper.

After the exchange phase, the post exchange phase follows, where ratings the transaction or complaints about the product etc. occurs. This phase is outside the scope of this paper, but it was mentioned to describe the phase neighbouring the ending boundary of the exchange phase.

When do we have deal?

When customers use C2C marketplaces, some customers seemingly manage to fulfill transactions without ever stating in text that they have made a deal or agreement. Considering this, it is difficult to define when a deal or mutual agreement is reached. Human behavior is sometimes irrational, and in addition, no two persons are alike. That is why it is hard to draw a clearly defined line of when a deal between two parties is made. For instance, one seller may be accustomed to that the terms of any exchange is made on the basis of the terms stated in the classified ad itself. On the other hand, a potential buyer may want to engage in haggling, completely disregarding any of the terms stated in the seller's listing. Similarly new customers may not be accustomed to the current C2C marketplace etiquette.

It is difficult to measure or know whether a party's perception of the agreement is aligned with the other party's perception or not. Customers on C2C marketplaces have many different personalities and may behave irrationally. Thus, the knowledge of customer's limitations, customer's struggles and how customers behave have both been motivating and guiding which frameworks and concepts that have been used in this paper.

Implications

Collaborative consumption is on the rise, and with it, there are many areas to improve. The exchange phase in C2C online marketplace transactions is one of these areas, as it is riddled with friction and hassle for a great deal of consumers. By defining some of the terms and models that are relevant to understand the issue, it is now possible to use these findings as a foundation for research to build upon. The definitions will let researchers be able to make their assumptions more rigorous, and provide a clearly defined terminology to work with. In addition, this chapter mentions some of the most influential Norwegian C2C marketplace services and some of their traits. Then, the following literature review goes through the existing literature on the different phases in online marketplaces. The review discusses weaknesses and usages of the existing models and terms. Albeit the existing literature on handover of goods in C2C marketplace services is sparse, the literature review is useful to have a clear idea of what is what when trying to solve the specific issue that this thesis is concerned with.

The current amount of literature with regards to C2C online marketplaces is rather sparse as shown in the literature review. Most of the literature that is published in online open access article databases is about topics such as reputation, trust, economy and purchasing-intention. Businesses catering to

customer needs have generally moved towards service design thinking when investing in and building their services and products (“Demystifying design thinking: becoming part of the movement - EY Consulting,” 2017). C2C online marketplaces are generally catering to a group of customers that are concerned about (a) low prices and (b) re-use of goods. Hence, the C2C online marketplaces aren’t directly competing with B2C online retailers. Nevertheless, these marketplaces need to meet the users’ increasing expectations to ease of use in order to stay relevant.

Unfortunately, many C2C marketplaces fail to evolve due to either C2C marketplaces being a down prioritized part of a company’s portfolio or lack of profitability in innovating the services. Thus, there is an unfilled gap in C2C online marketplace research that requires attention. Scientifically sound research into applied service design in this area will benefit customers of these services for years to come. In addition, by raising the number of completed trades on these platforms by innovating and creating better services, more people are investing their time and effort into sustainable living instead of employing a throwaway mentality.

This study employs a practical approach to the research question by developing a prototype to be used in hypothesis testing during the study.

Choosing a practical approach to do research within this gap accomplishes two things. First of all, it provides the reader with an applied example of the resulting theory, which indeed makes it easier for relevant actors to include the work in their own online marketplace services. Furthermore, it is crucial to observe how real users are using the applications in a natural setting to provide the most accurate results during a study.

By developing a functional prototype that mimics a C2C online marketplace it is possible to observe how the users are actually using the services, rather than merely asking them how they are using it. There is often a large discrepancy between what a user is doing and what he or she claims to be doing. In addition, it is beneficial to build a prototype that mimics an existing platform so that it is possible to compare the two services as objectively as possible. Limitations to this approach include the fact that creating such a prototype is time consuming and costly affair.

Scope

The goal of this study is to investigate whether new app functionality can reduce hassle and friction during the exchange phase of C2C marketplace transactions. That is, the phase in which goods are exchanged for money. Sintef has identified that hassle and friction during the exchange phase hinders the adoption of C2C marketplace apps. Therefore, it is of interest to explore new methods to facilitate the users in this phase.

Context

There are many reasons to why customers struggle on online marketplaces and they mostly boil down to poor communication between the parties of a transaction. Customers on these C2C marketplaces usually intend to sell and purchase goods, however customers often fail to complete the exchange phase of the transaction. This might result in discouraged customers that might refrain from participating in further trading activities.

Background

Little is noted about this phenomena in the literature as mentioned earlier, at least to the best of my knowledge. However, there are reports in the media and in online forums suggesting that there is a lot of hassle when participating on C2C marketplaces (Stokke 2016) (Anonymous 2014). Furthermore, in a Living Lab study, Sintef gathered user testimonials of C2C marketplace-users (Følstad 2017). The users were asked to describe a frustrating situation they could recall from C2C marketplace participation. Recurring themes that appeared in these testimonials were ambiguous agreements, sudden cessation of communication and people not showing up to collect.

Participants in the Living Lab study did also get to evaluate some concepts that Sintef had suggested to alleviate the frustrations. One of the concepts, a feature that lets the seller specify pick-up points, was well received by the study participants for its effects on clarifying the seller's terms of the sale.

It seems that C2C marketplaces leave the exchange phase for the customers to solve themselves. Not to mention that the popular C2C marketplace "Finn.no" removed their payment guarantee service as it was deemed to be too cumbersome to use (Stokke 2018). Consequently, customers are left to themselves in successfully communicating and planning agreements with other customers on these platforms.

Specificity

The objective of this thesis is to explore new methods to reduce hassle experienced during the exchange phase of C2C marketplace transactions. In turn,

the resulting methods will presumably help customers solve their problem of communicating and successfully planning C2C marketplace transactions. This thesis will not tackle other issues such as price mechanisms, trust, fraud or third party delivery services, neither will go into detail to why these difficulties with the transaction arise. In addition, to reduce the complexity of the scope I have decided to only focus on the seller's perspective of the exchange phase.

Relevance

The problems specified above are important for society to solve. Solving them is assumed to increase the participation on C2C marketplaces, in turn leading to more second-hand items in circulation. The redistribution of idling goods is sustainable and has a positive environmental impact (Botsman and Rogers 2011). In addition, C2C marketplaces will likely see a positive impact on user satisfaction, and the individual users will reap the economic and environmental benefits of hassle free trading.

Problem statement

The customers of C2C marketplaces are often unsuccessful at completing transactions due to several issues that arise during the exchange phase. At the time, customers are left without the tools to aid them in dealing with ambiguous agreements and absenteeism at the time of exchange.

Main research question

How can we reduce friction and hassle during the exchange phase of C2C marketplace transactions?

Sub-questions

Will non-intrusive pickup locations and a planning feature facilitate easier exchanges with less steps involved for the users of C2C online marketplaces?

To what degree will the addition of pickup locations and a planning feature in C2C marketplace apps reduce perceived hassle and friction during the exchange phase of C2C marketplace transactions?

Hypotheses

The added functionality reduces the number of steps customers go through to complete the exchange phase.
The added functionality positively increases customer experience.
The added functionality is readily used by customers.

Table i.i - Hypotheses

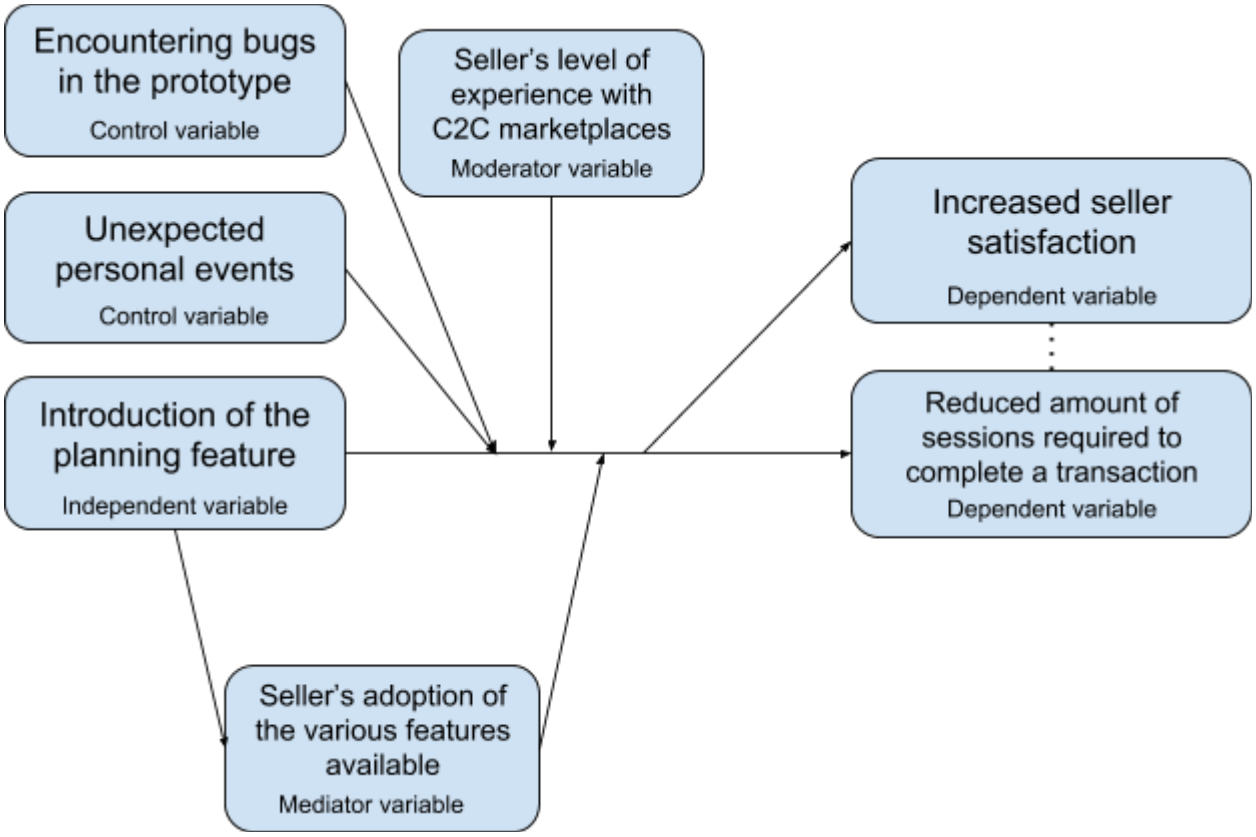


Figure 3 - The conceptual framework with relevant variables

Methods

The methods I used to conduct the research were chosen to be in alignment with the theoretical framework put forth in the background chapter. I picked methods to form a research design that aims to answer the research questions with preciseness and that also strives to avoid false positives in the resulting data. The main approach to answer the research questions was to build a functional prototype in order to explore new ways to improve C2C online marketplaces. Furthermore, I put the prototype to the test in a field experiment where I compared it to an existing C2C online marketplace app.

There are several reasons to why I decided to build a prototype. First, building a prototype is a efficient and suitable way to explore new methods by the means of “research through design” (Odom et al., 2016). Second, a fully functional prototype is a living example of the design that proves that explored concepts are feasible to implement in real life. Finally, a prototype is desirable when putting the design to a test in a field experiment because it is possible to observe, measure and compare the effects of the differences between the prototype and the baseline app, while controlling for extraneous variables at the same time.

To be able to answer the proposed research questions I developed a prototype that mimics the C2C online marketplace “Finn.no Torget”. Furthermore, I enhanced this prototype with features that aid the customers during the exchange phase of C2C marketplace transactions. As hassle and friction during the exchange phase is the main area of research in this thesis, I investigated the effects of the prototype in a field experiment. The prototype that I developed for this study is a fully functional prototype that captures both the functional aspects and appearance of the “Finn.no Torget” app. As a result, the prototype has functionality that lets participants use the prototype to experience the exchange phase in a real life setting.

In addition, the prototype imitates the “look and feel” of “Finn.no Torget” to a great extent. This was a deliberate choice to minimize other variables than the implemented functionality. Thus, by making the prototype look and feel as close as possible to the real app, I took steps to make the results from the study more accurate when comparing results from the experimental group and control group in the field experiment. Finally, the functional prototype does also contribute on its own to the goal of this research project. It does so by providing a feasible implementation of the proposed design for others to study, alter or learn from.

Unfortunately there were some drawbacks of using a complex and detailed prototype in the field experiment. For instance, finishing the course of the study is time consuming both for the participant and the researcher. Thus, the number of enrolled participants in the study were limited by the amount of time available to the researcher as well as the willingness of volunteers to participate. This might have affected the generalizability and preciseness of the results gathered from the study. Despite these shortcomings, I concluded that the benefits of conducting a field experiment outweighed the drawbacks in this case.

Another method would have been to primarily use methods such as handing out questionnaires and conducting interviews with hypothetical questions about user behavior. These methods are considered less appropriate to measure human behavior, thus it would be difficult to support the validity of the findings (Barakova, Spink, de Ruyter, & Noldus, 2013). Instead, the participants were using the prototype or the “Finn.no” app in the experiment, and as such it was possible to *observe* how the participants were acting when presented with the functionality being tested. In contrast, merely asking participants to describe how they believe they would have acted upon being presented with a conceptual design, would likely give more speculative results.

Furthermore, the usage of the prototype in the study resembled real life usage of a C2C marketplace. This strengthened validity, as the participants were more likely to behave as they normally would on a C2C marketplace. However, in order to avoid altered behavior in the participants, I had to be cautious of how I, the study coordinator, behaved towards the participants. I took several steps to avoid the aforementioned. For instance, I informed the participants to incorporate their given task into their daily lives, so that their behavior is shaped by their daily life as it usually is. I also prepared protocols that described how I should act towards

participants. A complete description of the steps taken is to be found in the “Field experiment” section below.

Concept

The process of picking and designing the functionality that differentiated the prototype from the “Finn.no Torget” app was largely an exploratory process. Results from a Living Lab-study[1] conducted by Sintef revealed patterns of struggles “Finn.no Torget” users frequently encounter (Følstad, 2017). Based on these, Sintef suggested six feasible concepts that could be implemented in order to enhance the C2C marketplace experience.

The concept that was chosen as the provisional design for the prototype suggested that the seller of a C2C marketplace listing should be able to indicate locations on a map where it is possible to pick up the item. Another concept suggested a form of standardized communication between the buyer and seller. I took inspiration from this concept and added a planning feature to the chosen concept. This planning feature would let the parties of a transaction create a mutual plan of the exchange phase. The plan should contain details of when and where the exchange of goods for payment should take place, and because parties often were unsure whether they had an agreement or not, it would also serve as a soft agreement between the two parties. Additionally, I also decided to add functionality to let the seller specify an area he is willing to deliver the item within.

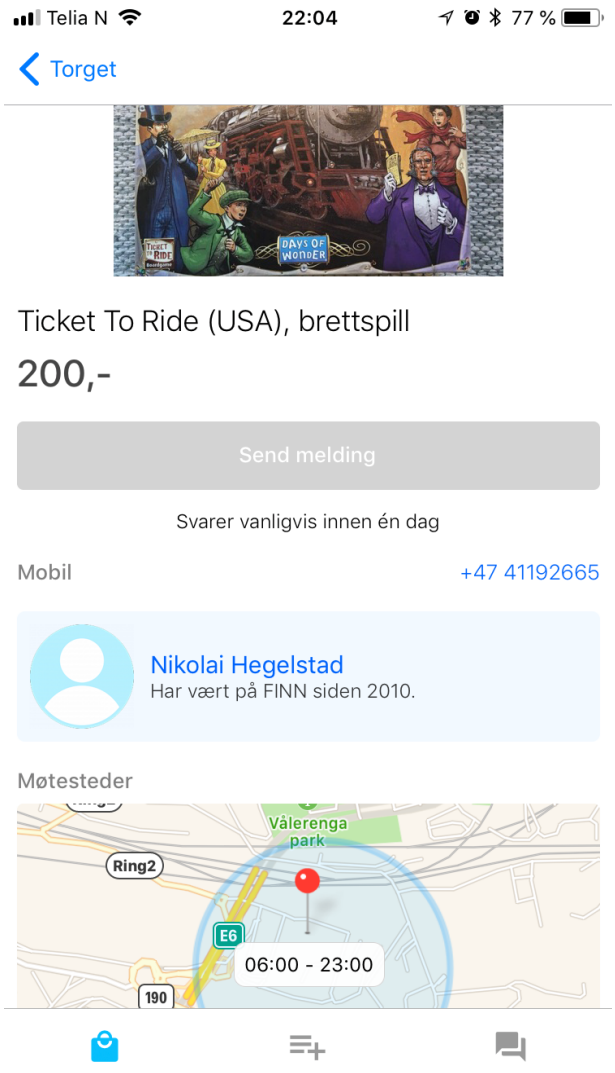
[1] A concept that is based on a systematic user co-creation approach integrating research and innovation processes. These are integrated through the co-creation, exploration, experimentation and evaluation of innovative ideas, scenarios, concepts and related technological artefacts in real life use cases. Such use cases involve user communities, not only as observed subjects but also as a source of creation.

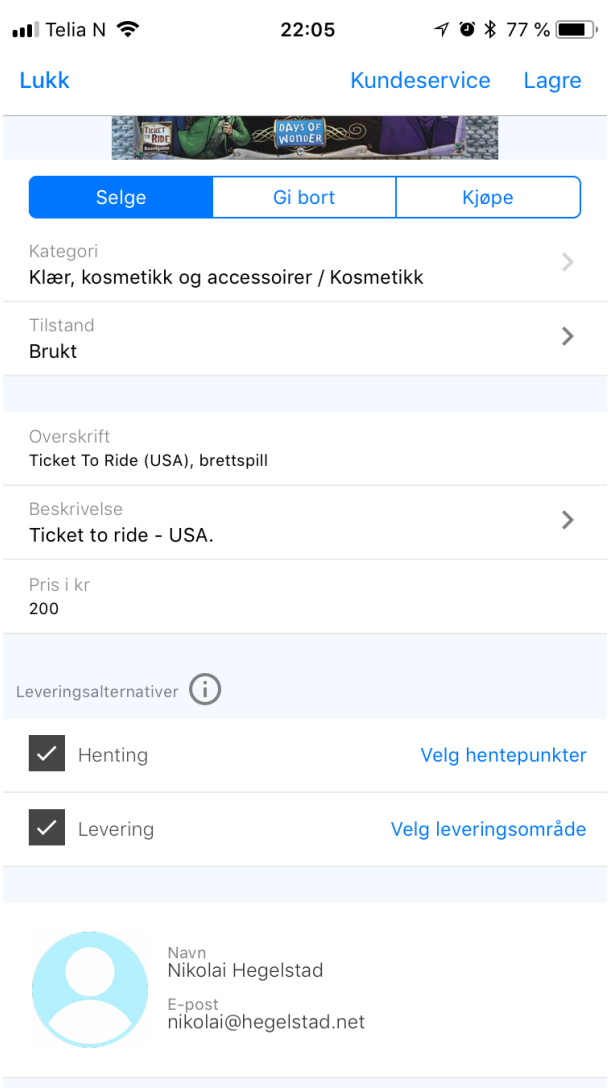
The three above concepts were promising because they could be added to the app workflow without forcing users to do something else than what they are used to. It was important that the added functionality didn't add new roadblocks to the C2C marketplace transaction. As a leading principle I decided to implement the features so that they were optional to use. This way I was pretty confident that I did not introduce novel sources of struggle, opposite to the goal of the study.

In the study, the "Finn.no Torget" application was used as the baseline app and the prototype had the same basic functionality that was needed to answer the research questions. Thus both apps supported the following features before before adding the above concepts to the prototype:

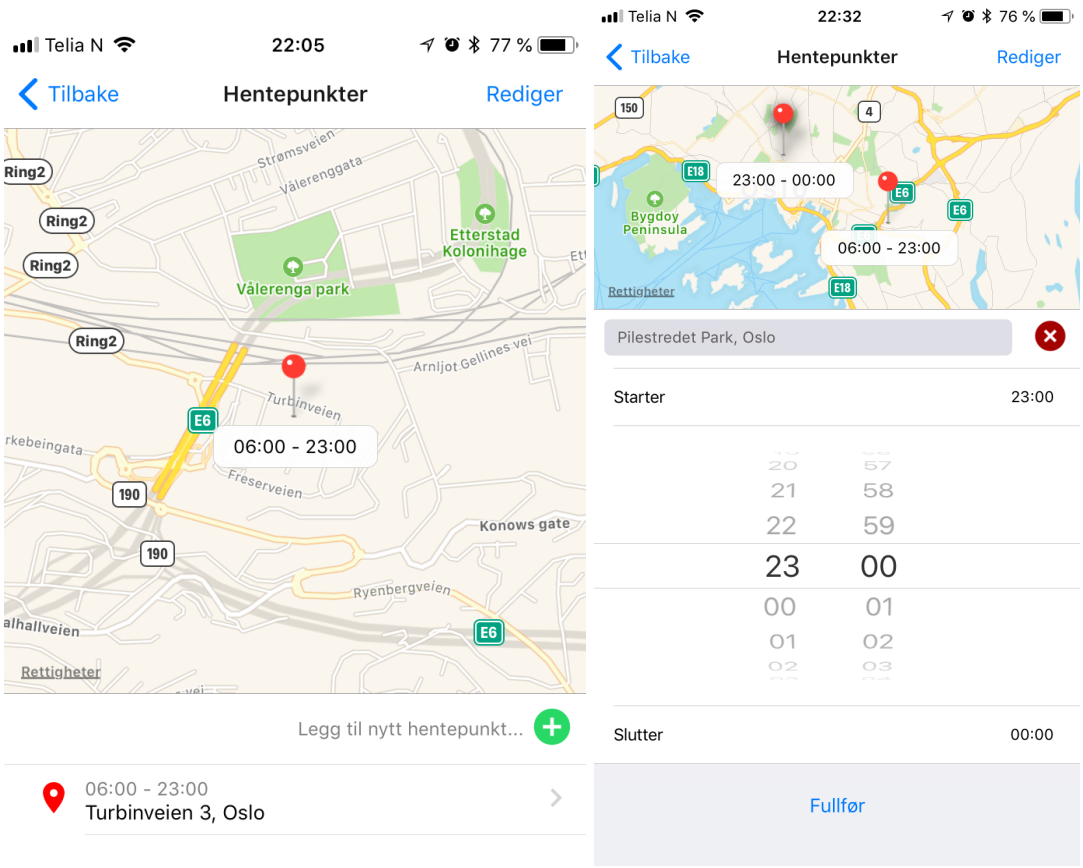
- Browsing and viewing listings
- Managing listings including statistics and editing listings
- Sending messages to sellers
- Chat functionality including notifications
- Offline persistence of all the data

Table 2- Distinct baseline features of the apps





Screenshots from application



Screenshot from application

The previously mentioned concepts were consequently implemented in the prototype and they constitute to what will be referred to as the *added features* for the remainder of this paper. The additional features are shown in table below.

Feature	Optional	Description
Pickup locations	Yes	This feature replaces Finn.no Torgets address line with a interface that lets the seller specify multiple locations where the item is available for pickup and at what time. These locations are then shown as markers on map in listing. See figure and . The seller adds pickup locations by searching for stress addresses (Karl Johans Gate 8), points

		of interest (Nationaltheatret [T-bane]) or neighbourhood (St. Hanshaugen). The search is powered by the google places API.
Delivery area	Yes	This feature lets the seller define an area, typically a neighbourhood, in which the seller agrees to personally deliver the item. The area is shown as a blue circle on the map in the listing. See figure .
Planning	Yes	This feature lets both parties of a transaction create a mutual plan. At any time during the exchange phase, either party is able to create a plan by either by (a) pressing “Create a listing” in the top of the chat window, (b) press any hours that are automatically highlighted in the chat messages. When making a plan, one must specify at the very least a tentative date and time to meet. When a plan is created its details are immediately shown in the status bar in the top of the chat window, as well as in the chat itself. When there is a plan, both parties are able to change date and time, and also add or edit a suggested location. Changes are propagated in real time to both users. Any pickup locations specified by the seller is shown in a map and can be picked by pressing the markers. The feature also keeps track whether the parties has RSVP'd to the plan. The going status is readily available in the status bar in the chat window. See figure .
Enhanced notifications	No	Both parties are receiving notifications about any changes to the mutual plan, such as changed date & time, changed location or changed RSVP status. In addition, both parties

		are notified by notification one hour before the date & time stated in the plan. The notification contains information about the status of the plan.

Table 3- The added features

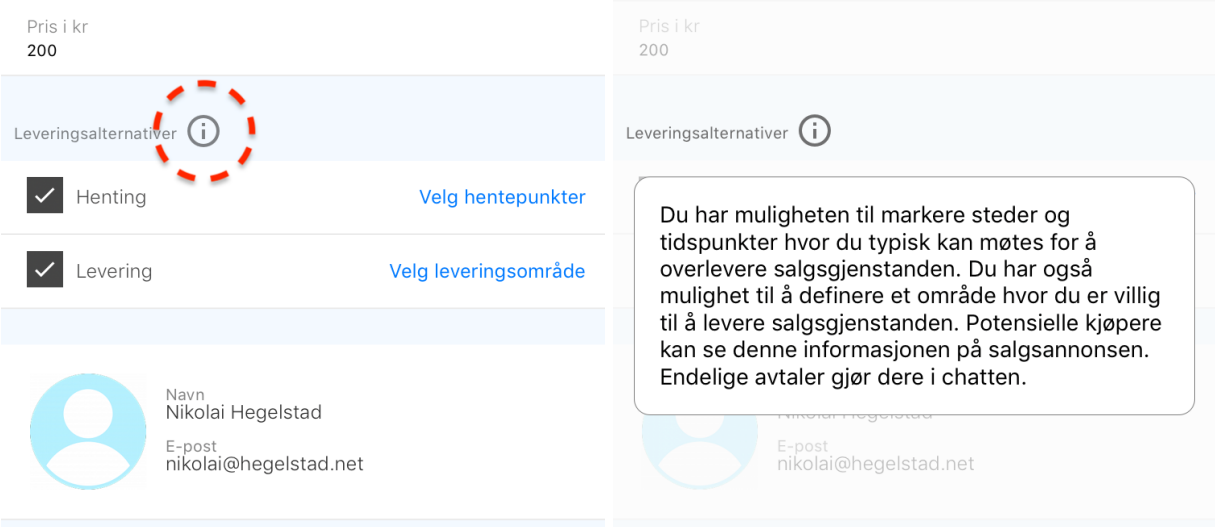


Figure 4- Tooltip with brief instructions

Participants using the prototype were able to identify the added features and also seek information on how to use it. Users of the prototype that were not interested or didn't notice the new features were not forced to use them to complete their transaction. In transactions where one of the parties decided to use some or all of the added planning features, the other party would be presented with the information provided by the first party. Such information could be a map showing specific locations the seller has suggested meeting at, or it could be a specific suggestion about a time or location to meet for the exchange, or both.

Implementation rationale

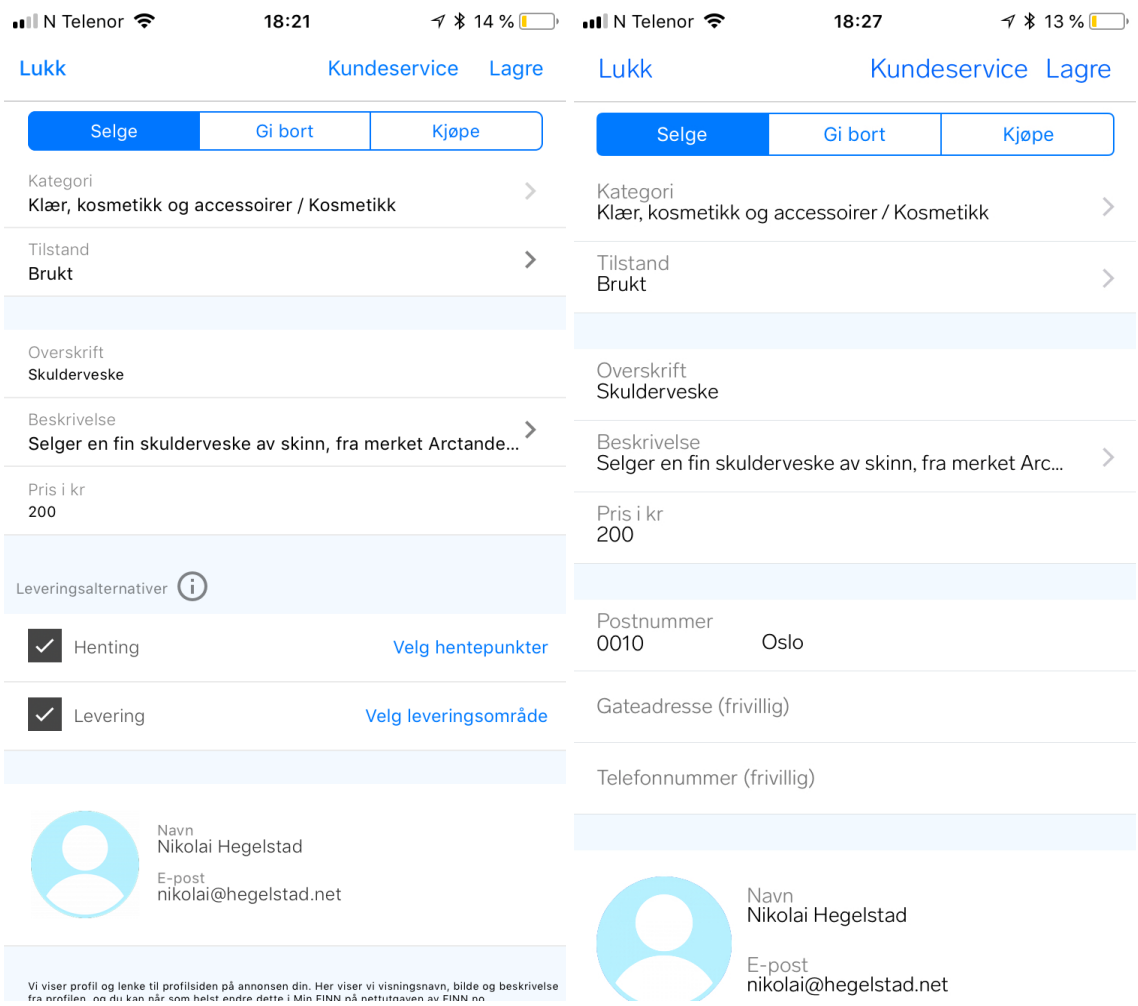
The features added to the prototype were inspired by the planning feature Facebook has developed for their app “Facebook Messenger”. The planning feature have been available to “Messenger” users since the launch of Facebook M-assistant in April 2017 (Eadicicco, 2017). As Facebook is renowned for removing features that detract from their services’ user experience, the fact that it is still available as of July 2018, is likely due to the positive contribution the feature adds (“List of Facebook features - Removed features,” n.d.). Nevertheless, some of the prototype’s planning features differs from the “Facebook Messenger” planning feature due to the different nature of chatting apps and C2C digital marketplaces.

The resulting prototype uses many of the same battle-tested features employed in Facebook’s “Messenger” app. In addition, the prototype also has optional features that aid the seller in stating their preferences with regards to the practicalities of the exchange process. E.g does the seller want to offer delivery within his neighbourhood? Or are there specific locations where pickup of the goods is preferred? The buyer is similarly able to take advantage of this information (if applicable) to speed up the process of negotiating the practicalities of the exchange. Furthermore, both participants receive notifications 1 hour beforehand their plan is to take place, this was a measure to reduce the likelihood of a no-show from one of the participants, which is something many customers complain about (Følstad, 2017).

Together, these non-intruding features were chosen and implemented to enhance the experience of the exchange phase in C2C marketplace apps. The features aim to do so by facilitating the exchange process by enabling the parties to collaborate

on a mutual plan. In turn, the plan represents a psychological contract[2] between the parts, that both reveals hidden expectations that the parties may have and facilitates movement in the exchange phase.

A limitation with regard to the conceptual design were the possibility of users perceiving an excessive amount of choices when creating a listing. The design includes two additional choices in the listing options, of which one replaces the current location fields as shown in figure n.n. This means some users might be dissuaded from using the features. However, the added choices were made optional to use, so that users are less likely to be confused when creating listings.



[2] The implicit promises (expectations and inferences) within relationships

Figure 5 - Prototype on the left, “Finn.no Torget” on the right.

Technical implementation

A considerable amount of time went into the development and implementation of the prototype that developed for the field experiment conducted as a part of the thesis work. The prototype was successfully deployed to Apple TestFlight for distribution to participants. Running the app on Android devices only required distribution of the app executable.

I began the implementation by developing a prototype that mimicked the baseline “Finn.no Torget” app, omitting features irrelevant to answer the research questions. Then I successfully implemented the above features into the prototype. To rapidly develop such a complex and detailed prototype, I used the framework React Native, which is a framework for building native apps using React. React Native is a cross-platform development framework, write once, run on multiple devices. The main reason for choosing React Native was the large amount of community created modules that provides building blocks to rapidly prototype advanced apps. Also important was the ability to rapidly change functionality as well as the look and feel of the prototype during development. React Native uses Hot Code Reloading[3] which displays changes to code without recompiling the entire code. Being able to efficiently iterate the design of the prototype made it less intimidating to pursue bigger changes to the design, which in afterthought was crucial to build a prototype relevant to the study.

[3] Software concept that allow components of a React application to be changed without reloading the entire application.

Field experiment

When exploring new methods by prototyping it is crucial to validate and confirm the usefulness of the added functionality. By doing so, the work contributes to and advances the knowledge on C2C marketplaces. Therefore, I chose to conduct a randomized field experiment where the enrolled participants were randomly allocated to one of two groups, either the experimental group or the control group. I used randomized assignment to achieve unbiased causal inference[4] and the participants were assigned to either the experimental group or the control group in a pseudorandomized fashion (Gerber & Green, 2011). More specifically, the participants were alternately assigned to each group as they were enrolled in the study, with the exception of the last three (3) participants which were decided to be enrolled into the experimental to the benefit of answering the research questions more accurately.

During the experiment, the participants of both groups were instructed to perform identical tasks. The task of this experiment was for the participant to act as a seller and sell a provided item using the app. This means that this study is only concerned with the seller's perspective of the exchange phase, and that the reader must be careful not to interpret the results as valid for the buyer's perspective, as they could be completely different. This was a deliberate decision to focus on a smaller more specific question with more preciseness.

The specific item the participant were to sell in the study were provided to the participant upon joining the study. All the participants sold similar items, gift boxes from Victoria's Secret, see Appendix. The experiment group were doing the

[4] The process of drawing a conclusion about a **causal** connection based on the conditions of the occurrence of an effect.

task using the provided prototype installed on their personal phone. While the control group were doing the task using “Finn.no Torget” on their personal phone.

I conducted a field experiment to leverage its ability to capture real-life settings while still being able to manipulate independent variables (Gerber & Green, 2011). I used the field experiment method to be able to capture and measure how the participants behave while performing their task. Research says that *observing* behavior is more likely to reflect real life usage than other methods such as lab experiments, interviews or questionnaires (Barakova et al., 2013). Thus, a field experiment provides higher ecological validity because the results are more likely to apply to the real world.

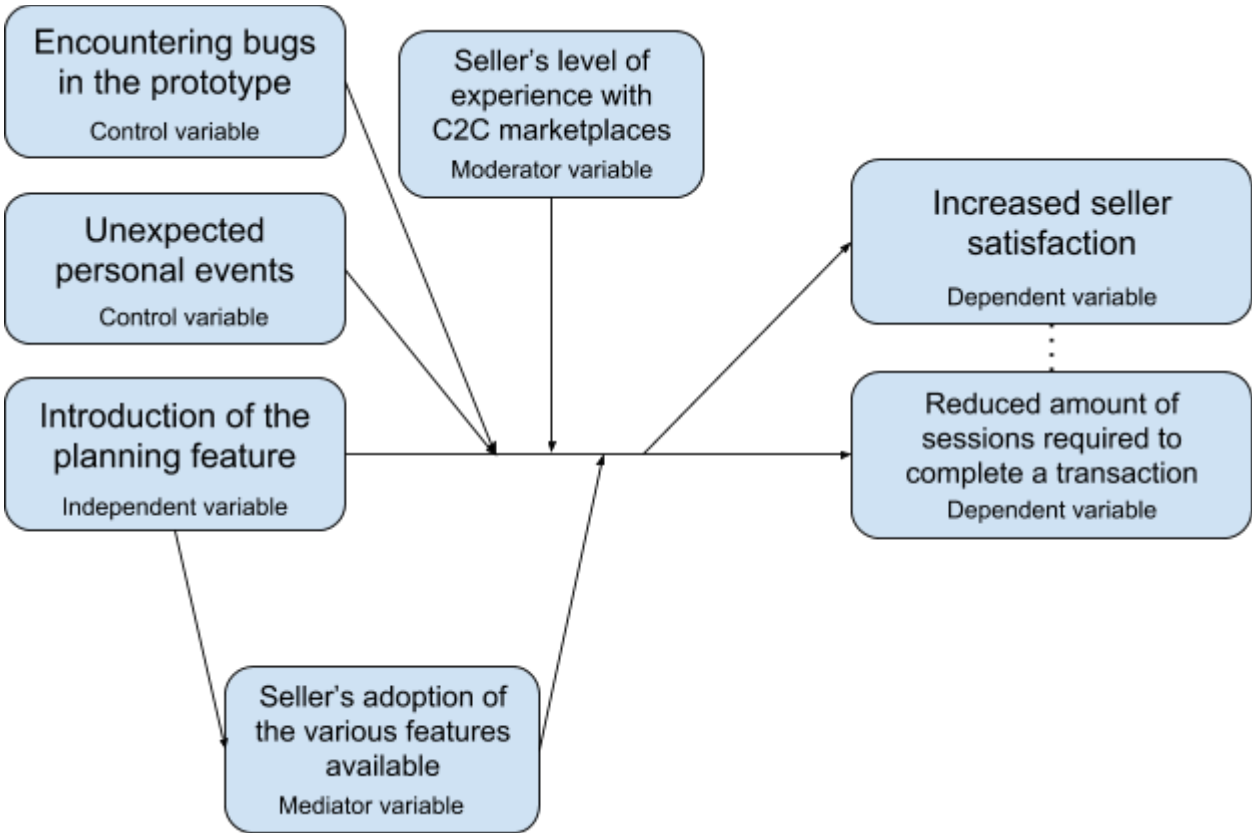
Experiment design

To answer the hypotheses put forward in the previous chapter, I built aforementioned prototype and made a fitting experiment design that aligns with the hypotheses and prototype design. In the study I enrolled participants to complete a task of listing and selling an item on the marketplace app respective to the group they were assigned. Furthermore, the participants attended a short briefing interview, filled out a self-report assessment form during the task and finally attended a more comprehensive interview.

Experimental group

To answer my research questions I would need to test the additional features that I had developed. To do so, I used an experimental group and a control group. Then, I introduced the added features as the independent variable. It was achievable because the prototype mimicked the look and feel of the “Finn.no

Torget". This way, it was possible to measure the effects of the pickup locations feature and the planning feature on C2C marketplaces.



When instructing participants in either group about the task, I made sure to refrain from mentioning that I was testing new features in the prototype. Rather, the participants were only told to sell the provided item as they usually would do on "Finn.no Torget". To make sure that participants were able to identify and use the new features, a small tooltip was added within the prototype to describe shortly how to use the features. The participants were not told about this tooltip, but they could discover it themselves within the edit section of the listing.

The participants in both groups listed the provided item on their respective app. In order to remove the unreliable buyer variable I was acting as the buyer in all the transactions with the participants. All participants were also suggested to set

the price to 300 NOK in order to avoid unwanted attention from other buyers on the platform, however this only applied to the “Finn.no Torget” group.

Task

The task given to the participants was to publish a listing on a C2C-marketplace, either on the prototype or on “Finn.no Torget”, and then proceed to sell the item as they would usually do when using “Finn.no Torget”. All the participants had previous experience with selling on “Finn.no Torget”, which was important so that the communication between the participant as a seller and me as a buyer could be strictly about the exchange process.

Equally important, the participants were given physical items to sell as a step to make the exchange process more realistic. The item that was selected as the item the participants would be selling was a gift box from “Victoria’s Secret”. The item represents a typical item laying around that users of C2C marketplaces would have to decide if they want to sell, use or throw away. If the marketplace enhancement added to the prototype makes the exchange process less frustrating, more people would possibly be more willing to participate on online marketplaces.

Furthermore the task was designed so that it only captured the exchange phase as described in the theoretical framework. To do this, I made protocols that clearly define the boundaries of the task, these are described in one of the sections that follows.

Additionally, I was only interested in the exchange phase of a C2C marketplace transaction, thus I removed variables from the task that did not contribute to understanding the exchange phase. These variables were; which item to sell, quality of the photos used in the listing and listing price. Instead, these variables were predefined in the listing before the participant started their task, acting as well defined starting boundaries for the task.

Experiment Structure

I structured the course of the experiment so that the participant's task was kept separate from the meetings and other practicalities with regards to the participation in the study. The separation was important to make the task as lifelike as possible. Therefore, I arranged two meetings with the participant, one before the task and one after the task. When participants did their task, they strictly communicated with me as buyer, not as a researcher. Nevertheless, I used interviews in both of the two meetings to gather data about the participant and their experiences during their task that could be of relevance when interpreting the results of their task. The meetings are referred to as interviews from this point.

First interview

During the first interview, participants were informally asked to share information about their age, occupation and previous experience with C2C marketplaces. Afterwards, the participants were handed the item they were to sell and instructed about the task. The instructions listed in the table below were communicated to all participants, in addition, instructions were given on a case to case basis according to the participant's individual needs. Additionally, I made sure that I were reluctant to give out information about the added feature that

were being tested. This was done to prevent personal bias to influence the participant to use the feature when they normally would have not.

- Participants were told to go about the task as they normally would do when using C2C marketplaces, so that their focus is on selling the item and not on “participating in a study”. - Participants were informed that their performance would not be rated, so that they hopefully will refrain from treating their task as a game or a challenge. - Participants were told that the physical item they were handed is provided to make the trade as real and lifelike as possible. - Participants were informed each participant that if the task doesn’t work out, the participant should be able to keep the item or the gift card as compensation for participating. This step was taken to avoid that the participant feels the need to complete the transaction only because the provided item is not his or hers belonging. - Participants were informed to start their task by completing and publishing their listing on the C2C marketplace the same day as the interview.

Table 4 - Instructions given to participants

Then, with the participants consent, I installed the prototype application (not applicable for the control group), and proceeded to prepare the listing for the task on the participant’s mobile device. Finally, to conclude the first interview, the participants were handed a self-reporting assessment form printed on a two-sided sheet, along with instructions on how to log their experiences during their task. See Appendix.

Task

During their task, the participants had opportunity to edit their marketplace listing as they would normally do, and they were able to decide for themselves how they would finish their task of selling the provided item. To complete the task both groups of participants had access to features equivalent to the “Finn.no Torget” app, while the group using the prototype app had the additional set of features mentioned previously.

Also, during the task, the participants made an entry in the self-reporting assessment form every time they were interacting with the app, e.g. editing their listing, receiving a notification from the app, chatting with potential buyers, planning an exchange (if applicable). In each entry added to the form, the participants were asked to report their experience with the interaction and communication within the app to the best of their ability.

For the participants to be able to complete their task, there would need to be a buyer. In the experiment, I acted as the buyer towards all the participants as a step to reduce the complexity of the study and results. As a result, the experiment focuses on the seller’s perspective of the exchange phase. To ensure that the participants were similarly treated, I followed some predefined guidelines that are found in the buyer behavior section of the protocols section below. It was important that I acted towards the seller in a way that didn’t make the exchange phase too easy, nor too hard. To combat this issue, the guidelines used for the buyer’s behavior were designed to let the seller do most of the work. This design choice resulted in data that could tell if the added planning feature could remove hassle and friction from the seller’s perspective in C2C marketplace transactions.

Similarly, I was also careful to make sure that I was not too eager of the new features added to the prototype. This was important because of the fact that I had

become very familiar with the new features during the development of them, and also because of the excitement of testing them for the first time.

Final interview

The last part of the study was an interview with the participant conducted shortly after meeting with the participant to complete the exchange. The interview was an semi-structured interview with the goal of supporting the participant in recalling experiences that occurred during their task. I also administered the SMEQ-scale[5] at this point in the interview.

- Given the SMEQ-scale, how mentally taxing do you consider the task you just did?
- How much experience do you have using Finn.no Torget?
- How would you describe this sale compared to other sales you've done?
- What does the process of negotiating time and place of the exchange usually look like when you are selling on Finn.no Torget?
- How do you value your privacy when acting as a seller?
- Did you use the option to add pickup points with time intervals?
- Did you use the option to create a mutual plan?
- Did you notice the option to press the highlighted hours that appeared in the chat messages?
- What is your job situation like?

Table 5: Interview guide

Furthermore, the interview was held in a conversational style in order to create a non-judgemental setting that invited sharing of important details that the

[5] Subjective Mental Effort Questionnaire - Easy to administer scale that measures the amount of effort people feel they have invested, and not the amount of effort they think the task may have demanded.

participant might find embarrassing to mention. Notes were taken during the interview, and were typed out immediately after finishing the interview, typically at the nearest cafe. During the interview I listened to the participant's general experience with the sale, I used probing questions such as asking participants to clarify and explain in greater detail, asking them to compare this sale with previous sale experiences and asking them if any special circumstances appeared during their task. The answers to these questions were useful to analyse the data collected during the participant's task. In addition, I selected quotes from the interviews that captured significant findings that the participant experienced. See Appendix for filled out data.

The major purpose of this interview however, was gathering and confirming the accuracy of the participant's self-reported data from the assessment form. As such, as a step in each interview, I meticulously went through each entry in the form together with the participant. I checked that there was one entry per app session, and that each entry had been described to the best of the participant's ability. In the case of a missing entry or an entry with insufficient data, I guided the participant to recall the events by going back to the event by walking through the timestamped chat messages. In most cases participants were able to recall the events and fill in the missing details, but sometimes the participant was unable to recall their experience, and the entry was left incomplete rather than forcing an answer. Regardless, all entries were investigated to rule out any discrepancies, that way I could be confident that the collected data was accurate and capturing the full picture of an exchange. At the end of the interview, the participant was handed their gift card valued at 300 NOK as promised during enrollment.

Customer Journey Modelling Language

CJML is conceptual modelling framework that offers a visual representation of customer journeys[6] as they unfold in real life settings (Ragnhild Halvorsrud, Kvale, & Følstad, 2016). It is a low-cost, easy to use framework that has many applications within service design research. I used CJML to visualise data collected in the participant's self-report assessment forms. I also used concepts from the framework when operationalizing the variables that were measured during the study.

The concepts from CJML are well suited to measure service processes such as those provided by the app platforms being tested in this study (R. Halvorsrud, Haugstveit, & Pultier, 2016). Important concepts that I used in this thesis are explained in figure below.

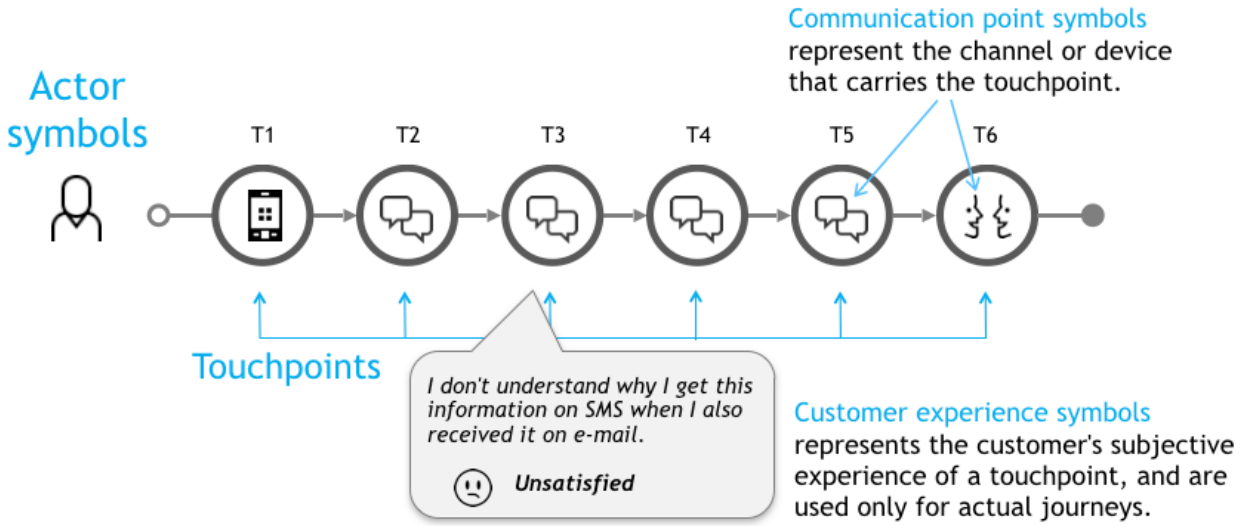


Figure 6: Relevant concepts from CJML

[6] Customer journeys are the sequence of steps a customer does to achieve a specific goal or outcome.

In addition, because the framework does not provide a feature of displaying how much time was spent at each touchpoint, I've augmented the framework with this feature myself as a mean to convey the collected data.

Operationalized measures

In the experiment I measured the usage of the distinctive features that made up the conceptual design of the prototype as shown in table . They constitute what has been referred to as the added features.

• Pickup locations	(optional feature)
• Delivery area	(optional feature)
• Planning	(optional feature)

Table 6 - Distinct features of the prototype

I measured if these features were used by participant and to what degree. The measurement was done by observation of the participant's listings and chat messages. Furthermore, I measured if the participant used features as intended, and if they seemed to achieve some sort of synergistic effects when the effects where used together. These findings were successively used in the analysis of the results. For instance, sellers succeeding with the pickup locations feature might increase the parties success rate with the planning feature. In addition, by measuring the usage of the different features it was possible to do a manipulation check to know if the manipulation done in the experimental group really did work or not. The check was done by looking at whether the added features were used or not by the participants in the experimental group.

Furthermore, I was also looking at different background variables that could be responsible for skewing the results in a specific direction. Relevant individual background variables that emerged during the interviews were noted in the interview notes. In addition I systematically collected background variables such as the participants age, occupation, and previous experience with selling Finn.no Torget. All of these variables could possibly explain participant's behavioral tendencies. For instance, a participant with a stressful occupation might be less willing to participate in selling on C2C marketplaces if the hassle is high, whereas a seller with low income might endure more hassle because of the monetary gain. In addition, if for instance a participant's full time occupation is to sell goods on C2C marketplaces, then the participant's results should be analysed in light of his familiarity with C2C marketplaces. These variables are therefore included in the results chapter.

The main measure used in the study was the touchpoints from the CJML. These touchpoints contained information depicted in the "Kundereise" sheet that is found in Appendix. During each customer journey touchpoints were measured, one touchpoint was collected per seller interaction with the app ie. looking at a notification, opening a notification, reading chat messages, writing a message, looking at or editing listings, using the planning feature. The handover meeting was also collected even though the communication isn't in the app. The touchpoints communication point symbols were restricted to "App on phone", "Communication" and "Face to face meeting". Interactions during the touchpoints were instead reported with customer experience symbols and descriptions as a large part of the interactions were trivial.

On the other hand, at every touchpoint, the amount of time used was measured in approximate minutes. In addition to the time used, the touchpoints captured the participants experience with the interactions that occurred at the touchpoint.

This was measured by instructing the participants to draw a smiley on the “Kundereise” sheet next to each touchpoint row in the sheet. Furthermore, the same sheet also collected the participant’s description of how the communication during touchpoint was experienced.

Finally, I measured Subjective Mental Effort by administering the SMEQ scale post-task. The SMEQ scale is a easy to administer one-question questionnaire that has been shown to be reliable even with low sample sizes and also easy for subjects to use (Sauro & Dumas, 2009). The scores are also highly correlated with other measures such as time used on task and SUS[7] score.

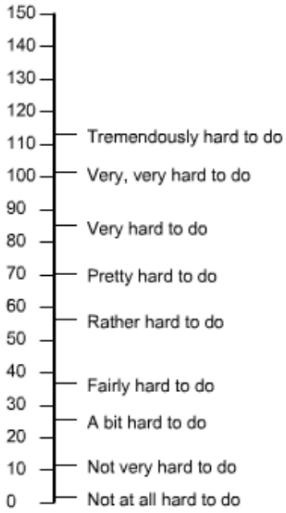


Figure 7: SMEQ scale

> “*Among the advantages of this measure are that it can:*
>
> - *provide diagnostic information about usability issues*
> - *measure user satisfaction immediately after the event, usually the completion of a task, potentially increasing its validity”* - (Sauro & Dumas, 2009)

[7] System Usability Scale - a post-test questionnaire that provides a quick reliable tool for measuring the usability of an application.

The scale was administered twice in quick succession to the participants, first they were asked: “Given the SMEQ-scale, how mentally taxing do you consider the task you just did?”, then they were asked “If you only were to rate process of negotiating the practicalities of the exchange, how mentally taxing do you consider the task you just did?”.

The result from the first question captured effort caused by usability issues caused by the prototype or possibly even extraordinary personal events, while the second result was assumed to capture the mental effort associated with the communication and interaction with the buyer. As a result, measuring the two different questions gave information that was used to identify usability issues or discrepancies within the data set.

Data materials

Several types of data, such as interview notes, participant’s quotes, touchpoints, chat logs and personal data, were collected during study. One excel sheet per participant was used to gather personal data as well as quantitative data in the form of the participant’s touchpoints (see Appendix). To systematically make sense of the raw data, I used the Customer Journey Modelling Language to map the data into visualiseable data graphic.

Furthermore, the participants were encouraged to document and keep track of their touchpoints and associated data on the self-report assessment sheet that was handed out. See Appendix. Most of the the participants were logging more than 50% of the touchpoints during the study, but some had mostly forgotten the task. In addition, all of the the participants added more information when cross-checking the data with the chat logs and events. The raw touchpoint data

from the self-report sheets was after each final interview systematically entered into the participant's excel sheet in the form of touchpoints.

Finally, during the final interview, I wrote interview notes from that were store alongside the excel sheets.

Participants

The target group were all "Finn.no Torget" users living in Oslo, Norway. The candidates were gathered using convenience sampling by reaching out to users of "Finn.no Torget" that had recently posted a listing ("SAGE Reference - Convenience Sample," n.d.). In order to come closer to a representative sample I used a specific set of criteria to filter out unfitting candidates (see table).

Exclusion criteria	Key reasons
People living outside Oslo	The functionality added to the prototype is for this study restricted to work within the Oslo region.
Other Mobile OS than Android and iOS	Because of practical limitations there were not built a prototype for other mobile operating systems.
Less than 3 previous encounters "with Finn.no Torget"	Users unfamiliar with the platform are more likely to become outliers in the data set because they aren't directly comparable to familiar users.

Table 7- Exclusion criteria

Experiment procedure

The following procedures describes in detail how the experiment was conducted so that study is reproducible. However, it should be noted that the author's line of questioning during interviews and approach otherwise is expected to differ if

someone else decides to reproduce this study. In addition, some procedure specifics that have already been mentioned elsewhere in this thesis have been omitted from this section to avoid repetition, nevertheless, the procedure section will include an chronologically correct description of the study.

The following procedures were followed when the study was conducted.

Recruitment

Before beginning the recruitment, the study was reported to NSD, Norsk senter for forskningsdata. The participants that were enrolled in the study were approached on “Finn.no Torget” on non-specific days between the hours 12:00 and 20:00. Potential participants were found via listings on “Finn.no Torget”. To find suitable candidates that likely would join I filtered the listings on the parameters found in table below.

Parameter	Value
Location	Oslo, City Centre
Radius	6 KM
Price	From 100 NOK to 1000 NOK
Time	“Sort by -> Date”

Table 8- Parameters used to select participants

The location parameters covered the majority of Oslo city, in which the app was tested, and the time parameter yielded fresh listings, so that all participants was guaranteed to have recent experience with publishing listings. Also, the price parameter was set to discover sellers that was more likely to be selling small to medium sized conventional items not requiring specialized transport.

The resulting listings were entered in a chronological fashion and the sellers were messaged the following message (in Norwegian), inviting them to partake in the study:

> *Hei [name]!*
>
> *Jeg skal ikke kjøpe gjenstanden du selger, men jeg tar kontakt vedrørende en masteroppgave-studie om finn.no jeg jobber med. Kunne det være av interesse å høre mer om deltagelse i studien? Enkelt og greit søker jeg deltagere som vil forsøke å selge, som man vanligvis gjør, en gjenstand som blir utdelt av meg, på finn.no. Deltagelse blir kompensert med et gavekort på 300 kr. Oppgaven passer fint å gjennomføre uansett om du har masse fritid eller har det travelt. Hører fra deg :-)*
>
> *Med vennlig hilsen*
> *Nikolai Hegelstad*
> *Mastergradstudent ved UiO*

Upon interest, potential participants were given more details from the invitational letter found in Appendix. A link to the pdf containing this letter was also provided to interested participants. When participants expressed an interest to join, I proceeded to schedule an interview at a time and location that was convenient to the participant, often at a local cafe in the city centre after work.

First interview

At the scheduled time and location I met with the participant to inform about the project this study is a part of, about the task and magnitude of it, about how personal information is handled by me (as specified in the invitational letter) and

that I need their consent to collect personal data to be used only in the study and as specified in the invitational letter. After the instructions were given, the participant and I proceeded to sign the consent statement at the last page of the invitational letter.

At this point I logged personal details into an excel template, see Appendix. The personal details were the name, mobile number (optional), email (optional), age, postal code, approximated amount of sales previously done, occupation, and mobile operating system. The participant was also given a numerical identifier and was then enrolled into either group in accordance with the randomization scheme. Shortly after, I asked for permission to install the prototype (if applicable) and to create the listing on their phone so that the participant were at the starting boundary of the exchange process. The listing was set up by me following the instructions in the applicable column of table .

Prototype	Finn.no
1. Register account in prototype by providing, name, email, cell phone number and user identifier. 2. Navigate to the “Listings tab”. 3. Press “Create new listing”. 4. Finished.	1. Log into Finn.no by opening the app. 2. Navigate to the “Listings tab”. 3. Press “Lag ny annonse”. 4. Press “Torget” in the list. 5. Press “Privat” in list with the name “Ny annonse”. 6. Write “Gavesett” in the text input that follows. 7. Select “Klær, kosmetikk og accessoirer/Kosmetikk”. 8. Take a picture of the item similar to the ones being used in the prototype group. 9. Add the picture from the picture library. 10. Remove the title “Gavesett”. 11. Finished.

Table 9: Steps involved in setting up the participant’s listing

After creating an unfinished listing in accordance to the steps above, the participant was then handed their mobile device and the item they were to sell. Then, the participant was instructed about the task according to the descriptions mentioned in the “Experiment design” section above. At this point, I informed the participant to complete the unfinished listing within the same day, and also that someone would be contacting them about their listing within the next few days.

Buyer protocol

As the participants were waiting for buyers interested in their listings, I proceeded to communicate interest towards their listing by using the chatting feature in the corresponding app that they were using for their task. The communication was guided, to the best of my ability, by the protocols stated in table .

- Send the following message to the seller after waiting at least 1 day:

  “Hi!

  I am interested in this.”

- The initial message should be sent on any day between after work hours (17:00-22:00).
- When answering the seller, messages should be sent with a delay similar to the delay that the seller used in the previous answer.
- At least twice during the communication the buyer should add a delay of at least 4 hours before answering, it can typically occur overnight.
- When answering, the buyer should strive to let the seller be the one suggesting where and when to meet to finish the exchange.
- To ensure fair treatment of participants the buyer should agree to meet at the location the seller suggests.
- The buyer should not be the one to take initiative to make a plan.

- The buyer shall respond to plans but still follow the other protocol items. -

Table 10- Buyer behavior protocol

The protocols, when adhered to, reduces unintentional researcher bias by introducing a set of rules that the researcher should follow to ensure similar treatment towards every participant. In the case of a deviation from the protocol, the deviation can then be reported in order to increase transparency. The protocols were successfully adhered to during the study, except where the results state otherwise.

Final interview

After the task was ended, regardless of whether the exchange phase was successful or not, I met the participant for a final interview. During the interview I collected the participant's self-report assessment sheet. In addition, I took notes of the participant's experiences from their task and otherwise I followed the descriptions given in the above "Experiment design" section. Finally, I thanked the participant for their contribution and handed over their gift card as promised.

Data cleaning

In order to present the results, the collected data was cleaned so that it could be quantified in meaningful ways. At the same time, data such as outliers have not been removed from the data set, neither individual touchpoints nor customer journeys. In some specific cases, special circumstances affected the results in

non-trivial ways, these results and the associated circumstances are mentioned where relevant to ensure transparency.

At the data collection events, such as during the interviews and when filling in the data sets with observations, some approximations were applied to the data in order to avoid unnecessary complexity. In particular, occupations were approximated to categories that show how much spare time the participant has to participate on online marketplaces, as well as giving a pointer into their socioeconomic status. Furthermore, satisfaction measured at the touchpoint level was approximated from the users smiley drawings into a 1-5 score as recommended by the CJML.

In addition, the descriptions of experiences and other facts collected that the participants had during each touchpoint, were cross-checked together with the participant to ensure their accuracy. The specific steps taken is depicted in the table below.

- Ensuring that the number of touchpoints in each journey corresponded to the amount of chat messages that qualified as touchpoints. - Confirmed with the participant that the experiences matched the stated, if not, the participant provided the missing data to be filled in. - The touchpoints were cleaned of data not answering the research questions, such as comments regarding app features and not the communication.

Table 11: Steps in the cross-checking process

On a general note, missing data was collected from the participant directly following their task in order to maximize the participant's ability to recall the events. The participant were encouraged to tell how they experienced the communication that happened during the touchpoints, and to decrease social

desirability bias, the participants were also assured that there were no wrong answers to this question.

Limitations and assumptions

With regards to the methods used in this study, I noticed some limitations that may have interfered with the findings. Some of them have already been described throughout the chapter and will not be repeated. Some of them were minor, such as being unable to blind the client and researcher of the experiment conditions and that the experiment was conducted during summer months. The first limitation was alleviated by making the task as real-like as possible in addition to the other steps described in the “Experiment design” section, whereas the second limitation is assumed to not undermine the validity of the results as people usually are occupied in the summer months as well.

When I started the work on this thesis I reached out to “Finn.no” to ask if they were interested in letting me add the functionality to their platform. “Finn.no” declined my offer and as a consequence I proceeded to build the prototype which is similar, but not identical to “Finn.no Torget”. The event was unfortunate as it would be very interesting to perform A/B testing on the developed feature.

Furthermore, manually reaching out to potential participants through “Finn.no Torget” was a time consuming process because “Finn.no Torget” uses strict filters to stop spam. Coupled with the fact that the study I invited customers to join was very comprehensive, led to a fairly low number of participants which in turn made it harder to draw precise conclusions transferable to the whole population. Nevertheless, the comprehensiveness of the study did also attribute to the depth

of the knowledge resulting from each participant. As such, I collected valuable data during the study, especially because I solely focused on the seller's perspective as an alternative to both perspectives simultaneously.

It would be very interesting to run this experiment with focus on the buyer's perspective, or even have real actors on both sides of the transaction. Nonetheless, the findings of the seller's perspective are reported in the following chapter.

Results

Sample characteristics

A total of 90 subjects were messaged on "Finn.no Torget" and invited to take part in the study. 11 of these subjects (7 men and 4 women) were willing to join the study. All of the subjects met the participation criteria and were subsequently enrolled in the study between July 2018 and September 2018. Of the twelve (11) participants, seven (7) participants were enrolled in the experimental group whilst four (4) persons were enrolled in the control group. Ten (10) of the eleven participants participated to the full length of the study, whilst one (1) participant failed to complete the task. None of the participants withdrew consent.

The age of the participants ranged from 21 years to 48 years, with a mean age of 33.4 and a median age of 30. The participants postal codes were distributed throughout Oslo as shown in figure below.

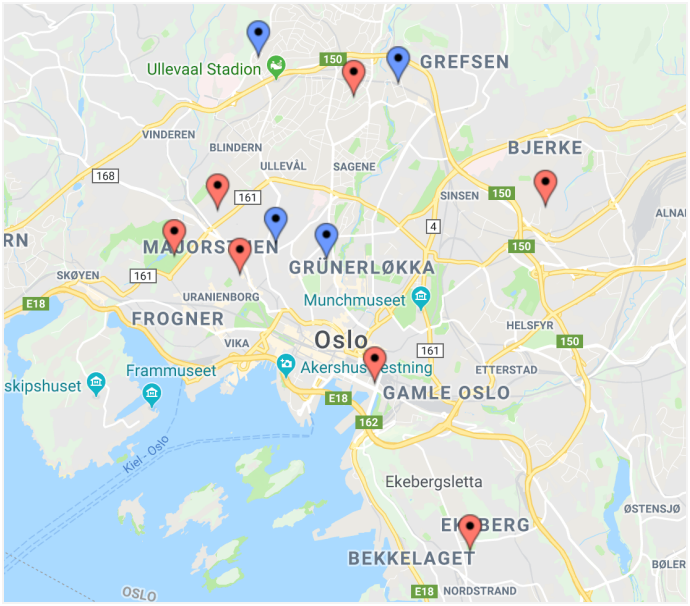


Figure 8: Map participants postal codes - control group (blue), experimental group (red).

With regards to work occupation, two (3) participants reported that they were students, one (1) participant reported that she was currently not employed, while the rest (7) reported that were occupied with full-time work. Among this group, three (3) reported that they were working irregular hours, while the rest (4) reported that they were working regular hours (ie. eight to four). The control group consisted of two (2) students, one (1) working irregular hours and (1) unoccupied, whilst the experimental group consisted of one (1) student, two (2) working irregular hours and four (4) working regular hours.

All of the the participants had previous experience with trading on Finn.no Torget. Therefore, all of the participants met the requirement of having previously sold 3 or more items on the platform. Furthermore, all of the participants also had experience with purchasing goods on the platform. Two (2) participants were primarily using Finn.no Torget to purchase goods, while two (2) participants were primarily selling goods. The rest (7) of the participants were participating in both selling and purchasing. Nevertheless, all of the participants

appeared familiar with the platform and how to create listings, receive notifications and communicate within the app.

In the control group, two (2) persons reported having sold a few items, one (1) reported having sold tens of items and one (1) reported having sold hundreds, whilst in the experimental group, two (2) reported having sold a few items, two (2) reported having sold a few items.

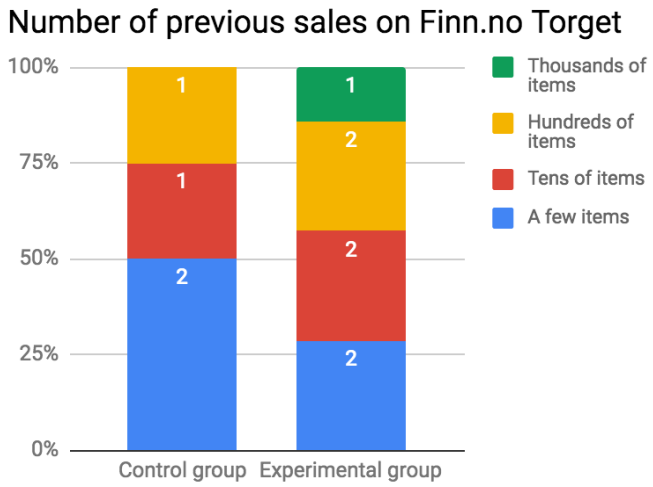


Figure 9: Number of previous sales in each group

Customer journeys

The primary data set consisted of eleven (11) customer journeys, one per participant. Each customer journey consisted of several touchpoints, and these touchpoints captured the participants interaction and experience within the app. Importantly, the experiences and interactions in the touchpoints are strictly about the exchange phase of the transaction. Furthermore, the touchpoints are confined within the boundaries described in the theoretical framework, which is important in order to answer the research questions accurately.

Consequently, the touchpoints were recorded from the point in time in which the exchange phase had started, in accordance with the starting boundary of the exchange phase. Similarly, the touchpoints were recorded until reaching the end of the exchange phase. At this point in time no further touchpoints were recorded.

There was made one exception to the constrictions defined above. A special touchpoint was introduced into the beginning of every customer journey. This touchpoint represented the editing and submission of the listing on the marketplace. This touchpoint captured the participant's experiences and interactions with the editing of the listing. However, the touchpoint fails to conform to the boundaries of the exchange phase and it does not directly answer the research questions. Nevertheless, the touchpoint is of importance to answer the research questions because it captures to what extent the added features are used and what the alternative cost of using them is.

All (11) of the participants completed the first touchpoint by editing and submitting their listing. Participants were also allowed to edit their listing as often they wanted, however none (0) chose to do so.

The number of touchpoints involved in the separate journeys ranged from five (5) to twelve (12) , with a mean number of touchpoints of 7. The mean number of touchpoints for the experimental group was 8.16, and 6.75 for the control group. A larger selection of the variables collected from the customer journey handout and the interviews is depicted in the table below.

ID	Sex	Age	Occupation	Touchpoints				Features			SMEQ
				№ of touch points	*Cumulative time spent in minutes*	*Cumulative time spent MAD**	*Average customer experience score***	*Used pickup locations feature*	*Used delivery area feature*	*Used plan feature*	
Control group (average)		31		6.75	21.5	8.5	4.6	n/a	n/a	n/a	11.25
113	Male	48	Shift work	8	28	6	5	n/a	n/a	n/a	15
115	Male	21	Student	7	31	12	4.1	n/a	n/a	n/a	15
117	Female	30	Unoccupied	7	16	9	5	n/a	n/a	n/a	0
119	Female	24	Student	5	11	7	4.2	n/a	n/a	n/a	15
Experimental group (average)		36		8.16	22.2	10.2	4.5	(86%)	(29%)	(29%)	15.8
114	Male	24	Office job	6	19	7	5	X			20
116	Male	23	Student	7	18	11	4.7	X	X	X	10
118	Male	47	Shift work	12	35	13	3.8	X			10
120	Male	35	Freelance	6	16	7	5	X		X	10
121	Female	28	Office job	12	25	13	4				35
122	Male	48	Office job	6	20	10	4.7	X			10
123	Female	45	Office job	- (3)	-	-	-	X	X		-

Table 12: Touchpoints, frequency of feature use and SMEQ.

*MAD = Mode Absolute Deviation calculates the deviation from the central point, ie. the most common time spent during touchpoints. ** Scale from 1-5 where 5 is higher satisfaction.

Touchpoints were systematically collected using the methods described in the methods chapters, the average values for the control group and the experimental group are reported below. The journeys were aggregated into a group average for each group, and then mapped into the visual customer journeys below.

Control group journey

The figure below depicts the average of the four (4) customer journeys in the control group. The average number of steps taken in control group journeys were

6.75, rounded up to seven (7) steps. The average cumulative time spent was 21.5 minutes and the average mode absolute deviation in time spent was 8.5 minutes. The average customer experience score on a scale of 1 to 5 where 5 is better was 4.6.

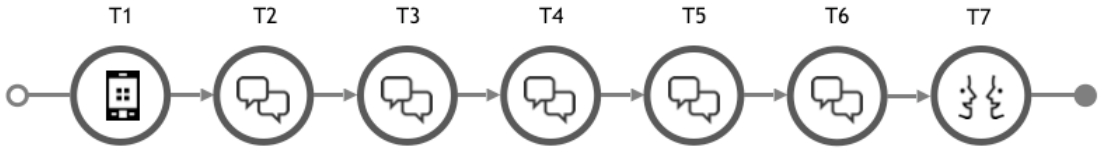


Figure 10: Visualisation of the average control group customer journey

Experimental group journey

The figure depicts the average of the steps from six (6) customer journeys in the experimental group. The average number of steps taken in the experimental group journeys were 8.16, rounded down to eight (8) steps. The average cumulative time spent was 22.6 minutes and the average mode absolute deviation in time spent was 10.2 minutes. The average customer experience score was 4.5 for the experimental group.

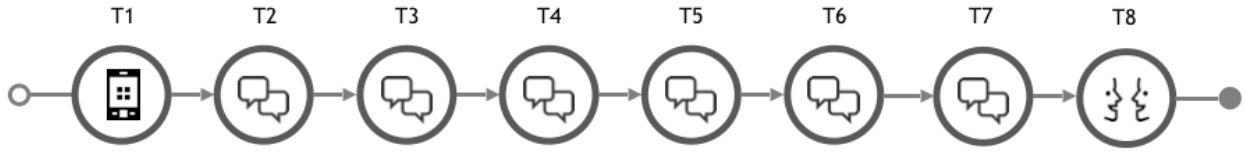


Figure 11: Visualisation of the average experimental group customer journey

Frequency of feature usage

During the customer journeys in the experimental group, six (6) of the seven (7) participants chose to create pickup locations as shown in figure (a) below. One (1) participant didn't notice the feature at all, whilst the rest (5) of the participants used it to create 1 pickup location each. (b) Two (2) participants did set the

delivery area as, and among the five (5) that didn't, three (3) didn't notice the feature and two (2) decided to not use the feature. (c) The last observation on frequency of usage is that two (2) participants used the planning feature, whilst five (5) didn't notice it at all.

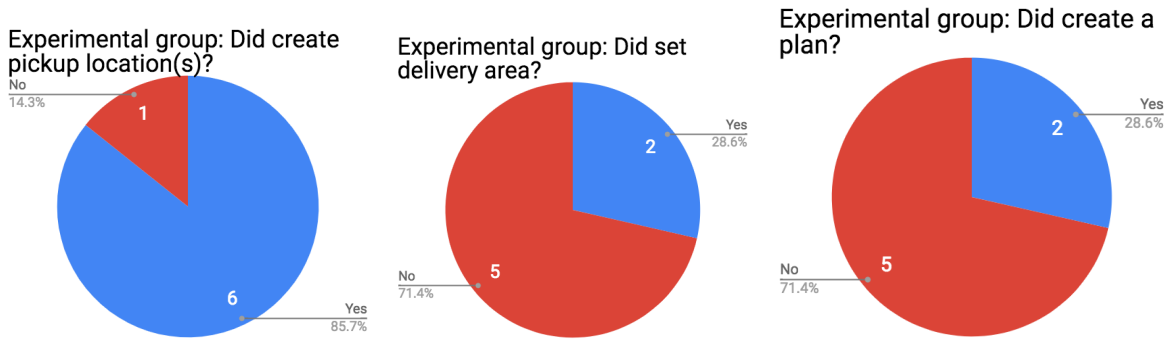


Figure 12 (a) (b) (c): The frequency of usage of the three sets of added features.

Participant's experiences as sellers

The following sections present some journeys that were judged to be of relevance to answer the research questions. They were selected on the basis of non-trivial deviations in the variables measured in table and especially when supported by experiences and quotes from the interview notes.

Case 1

Figure below gives a closer look one of the most interesting customer journey from the control group judging from the low customer experience and the long

time spent.

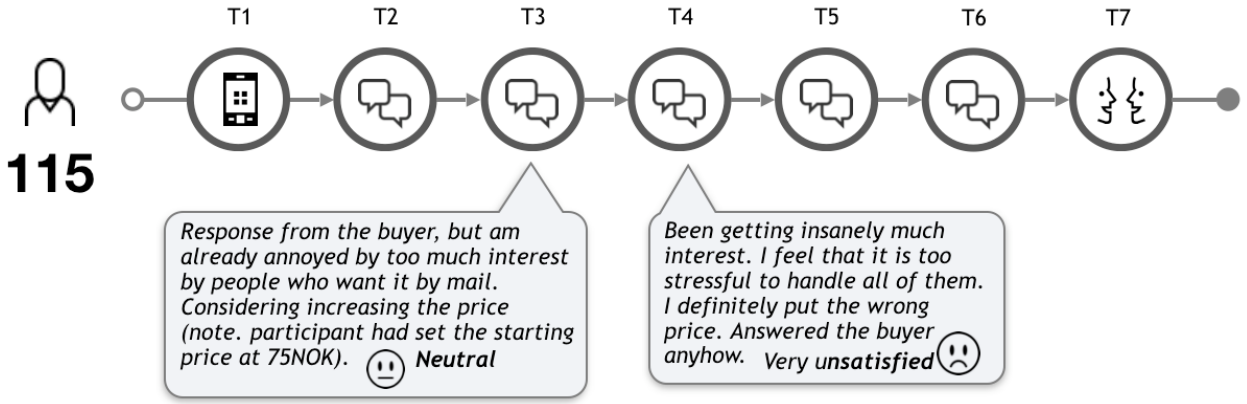


Figure 13: Key findings from participant 115's customer journey.

The customer journey in question is characterized by responses from other buyers than the researcher as reported by the participant on the touchpoints. The resulting data set is thus affected by the low listing price as a confounding variable. This is further confirmed by excerpts from the participant's final interview. When the low listing price variable, was removed, the participant reported that the remainder of the journey was similar to his usual trades.

Q: How would you describe this sale compared to other sales you have completed?
"I put an overly low price to start with, so I received a huge intense surge of requests. Then I increased the price and it calmed down. At this point the trade we had was actually very similar to usual trades. Usually there is some talk back and forth, and I also have to put in some effort to gain some movement in the trade."

Q: What does the process of negotiating time and place for the exchange normally look like for you?
"As a regular conversation - I ask if he or she can come and meet me for pickup, we also agree on a suiting time. If the buyer rather would meet, we agree on a

suitable time and place. Very painless. I rarely experience problems with negotiating time and place, and it is also important to offer time and place.”

Case 2

The next participant belonged to the experimental group and the customer journey shows a similar pattern as the previous journey from the control group. As seen in figure , the participant reports that he has issues with the keyboard in the prototype app. When notified of the participant’s troubles I identified an issue with React Native apps on the old Android phone he was using. I supplied the participant with a workaround between T4 and T5 to solve the issue, and he was able to perform the of the task without the bug affecting the findings. His customer experience was ‘Very satisfied‘ (5) for touchpoints T7 to T12.

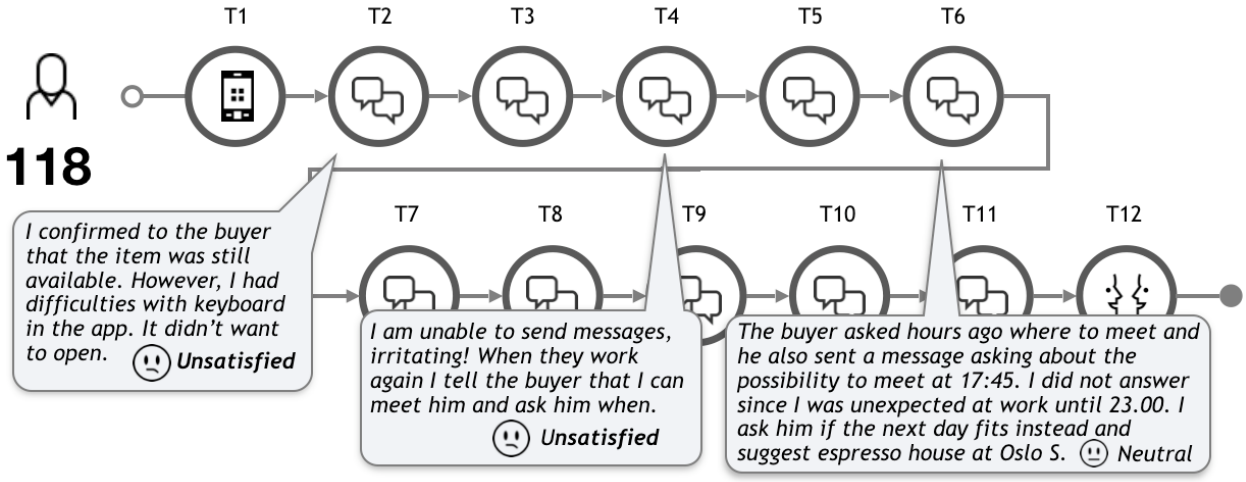


Figure 14: Key findings from participant 118’s customer journey.

Some excerpts from the interview notes reveal more information about the amount of steps involved.

Q: What is your working situation like?

“It varies a lot, 7.5 to 12 hours a day, it also varies between morning and evening.

Q: *How would you compare my behavior in comparison to other buyers you have dealt with*?
“I experience many different behaviors because I am selling so many items on Finn, but there were slightly more messages us between that usual.”

In this case, the above data shows that both the bug and the participant’s working situation affected the amount of steps in the journey. It is interesting to see that even though the bug was gone before T5, the participant was still hindered by unexpected work. Furthermore, the participant used the added pickup location feature, but in this case it did not cut the deal as the unexpected work lasted two hours past the interval he provided to the pickup location. On the other hand he did neither notice nor use the planning feature.

Case 3

The next participant has extensive experience with Finn.no Torget from doing sales on the marketplace as his main business the last 15 years.

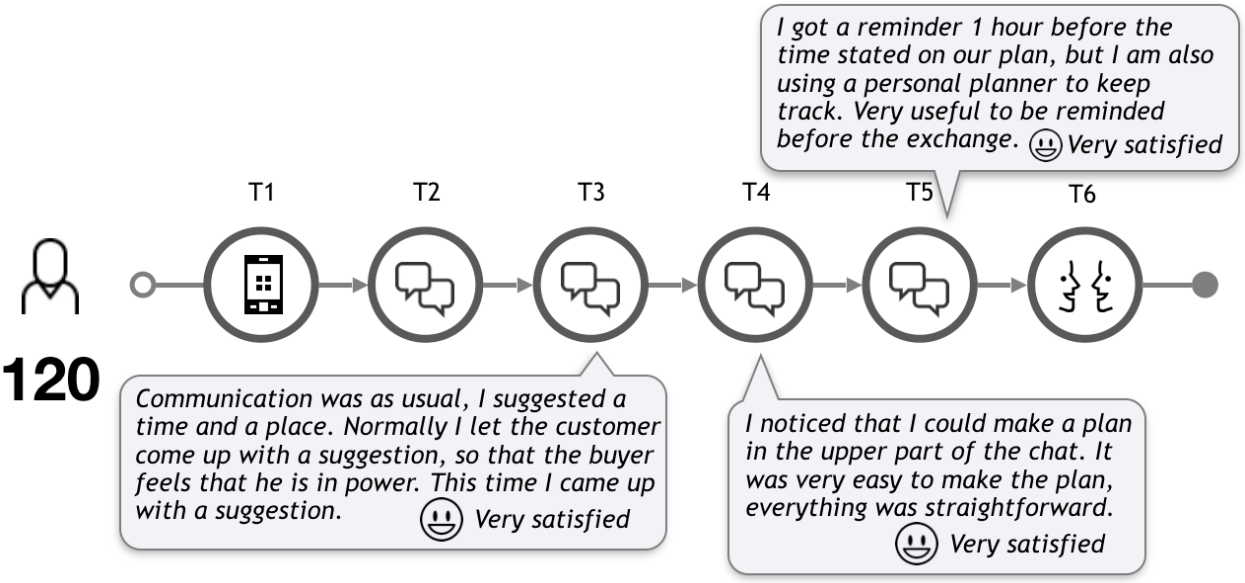


Figure 15: Key findings from participant 120's customer journey.

Q: *How would you describe this sale compared to other sales you have completed?*
"On par with with all of them, communication through a chat-function in an app. Easy, but everything is usually very similar. In this sale I think we had a very direct approach, straightforward without haggling, something which is very common to do. I make detailed listings to avoid unnecessary questions."

Q: *What does the process of negotiating time and place for the exchange normally look like for you?*
"Usually I ask when would be convenient to the buyer. I live in the city centre, so I am flexible, something which I think the customer enjoys. It's about customer service".

Q: *Did you notice the option to make a plan?*
"I noticed it at top of the chat-window and I didn't know about it in advance of the sale, but I am very curious, so I pressed it. Making a plan was easy, you could write an address and a marker would pop up on the location. An easy solution that didn't cause any problems. However, I don't think grandma at 60 would be able to use it. At least for me it is easier to make a deal via chat messages."

The participant is one of two participants that chose to use the planning feature. However, he discovered the feature first after he had already negotiated the practicalities. Nevertheless, he discovered that he was given a notification to remind him about the plan one hour in advance.

Case 4

The following participant had the longest customer journey together with participant 118 in terms of steps needed to complete exchange phase. The participant would likely have benefited from using the features as many of the touchpoints are associated with ambiguous plans that fail to happen multiple times. The interview excerpts below suggests that the participant are meeting

these kinds of issues regularly when selling items on “Finn.no Torget”. Also note that the participant didn’t notice any of the features at all.

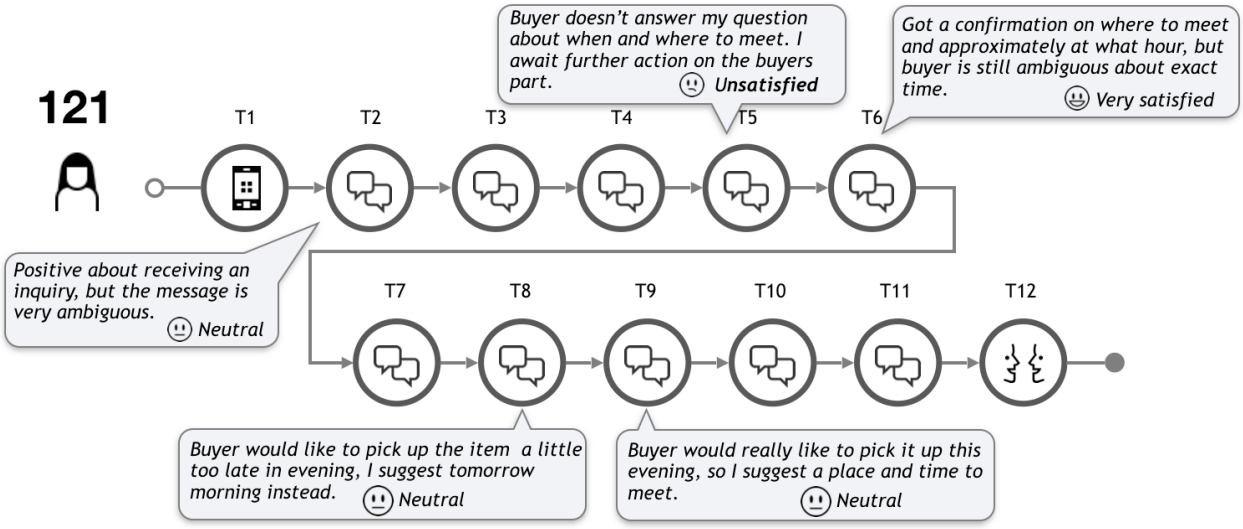


Figure 16: Figure : Key findings from participant 120’s customer journey.

Q: *How would you describe this sale compared to other sales you have completed?*
“More or less the same kind of communication, but maybe slightly vaguer than usual. I didn’t get out that much information easily, was forced to ask the buyer myself.”

Q: *What does the process of negotiating time and place for the exchange normally look like for you?*
“Well, that depends, it could very much the other party (buyer) to suggest time and place. The seller usually comes with an offer or suggestion.”

Q: *Did you use the option to add pickup locations to the listing?*
No, I didn’t notice that feature.

Q: *Did you notice the option to make a plan?*
No, I published the listing straight as I got on the metro after our interview and no further changes were made to it. I did neither recognize the feature in the chat window before you made me aware of it.

Q: *What is your work situation like?*
I work regular hours but have pretty stressed out daily life.

Interview themes

Some interesting themes emerged from the final interviews with the participants. For instance, the issue of anonymity and privacy was frequently discussed, and approximately half of the participants were concerned about their personal details.

Participant 120 said this about anonymity and privacy:
Q: *Is it important to you to be anonymous when acting as a seller?*
“It depends on what I am selling, normally I don’t publish my address nor my last name, but I may give out postal code and given name. The reason is because I have valuables stored at home. I don’t want to publish my address on a listing in an app because I am aware of how criminals abuse this kind of information. Finn.no Torget is used to map out where there are valuables, and at which hours nobody is at home.

In addition, I am generally skeptical about sharing gps-tracking data. I think it is generally stupid to retrieve information about where the customer is. The data could be sent to “collaborators”. The data could also get in the hands of wrong people either via Finn.no itself, or via people downloading the data from listings”

Participant 118 said this on the same topic:
“Anonymity is actually pretty important to me as I have learnt from a couple of unpleasant encounters with buyers. For instance, if my cell phone number was published on a listing, it has happened that I have been called in the middle of the about questions about buying small items worth no more than 100-150NOK. After

that event I have stopped publishing my address and cell phone number in listings.

In addition, I almost entirely use “Finn.no Torgets” chat-functionality and not sms, this lets me evaluate the buyer before I hand out my cell phone number and address.“

Discussion

To answer the research questions in this thesis I have examined the effects of the prototype that I developed by conducting a field experiment. The experiment yielded interesting results, the qualitative results are particularly interesting when working with a small sample size.

The main research question which this paper is concerned with is how to reduce friction and hassle during the exchange phase in C2C marketplaces. To answer the question I have defined the following sub-questions:

- Will non-intrusive pickup locations and a planning feature facilitate easier exchanges with less steps involved for the users of C2C online marketplaces?

- To what degree will the addition of pickup locations and a planning feature in C2C marketplace apps reduce perceived hassle and friction during the exchange phase of C2C marketplace transactions?

To answer these questions and provide new insights into this field of research I will begin by discussing the hypotheses that are part of the conceptual framework described in the “Scope” chapter.

Hypothesis

Hypothesis H1
The added functionality reduces the number of steps customers go through to complete the exchange phase.
The added functionality feature does not the number of steps customers go through to complete a exchange phase.

Table i.i: Hypothesis 1

The first hypothesis asks whether the experimental group, that had access to the pickup location feature, delivery area feature and planning feature, saw an average reduction in the steps required to complete the exchange phase of a C2C marketplace transaction. To answer the question the results from the control group must be compared to those from the experimental group. If the average number of steps customers go through are lower than the control group, there might be a positive effect on the reduction of the number of steps. Also, should the results indicate that the number of steps are increased, one must carefully interpret the various variables that might have affected the findings.

With regards to the number of steps customers go through, this research has found that the average number of steps customers go through are higher in the experimental group than the control group. This indicates that there is a possibility that the added functionality increases the number of steps the

customers must go through on average. However, there might be other reasons that explain why the participants in the experimental group on average went through an extra 1.41 steps, a 20% increase, during the exchange phase.

For instance, the research says that the average cumulative time spent on the exchange phase is only 0.7 minutes more in the experimental group, that is only a 3% increase. This finding shows that the above statistics alone doesn't answer the hypotheses. One must account for the small sample size in the study. If one only uses the quantifiable results, the findings are likely to be skewed in either direction should just one participant be affected by a uncontrolled confounding variable. Thus it is beneficial to supplement the above findings with the qualitative findings or attack the hypothesis from another angle.

For instance, a variable that is hard to measure whether is affecting the results or not is the subtle differences between the "Finn.no Torget"-app and the prototype. Differences in the frameworks used to developed the two apps means that they will never be exactly the same even though a lot of effort was put into the look and feel of the prototype. The only way to control this variable would have been to build the functionality on top of the "Finn.no Torget" platform itself. This option was exhausted during the early stages of this thesis when "Finn.no" declined the request. Furthermore, the results also revealed that at least one Android user in the experimental group experienced difficulties with the prototype that must be assumed to have affected the results, but the results do not say how much or if more participants were affected without reporting it.

In addition, the results showed that one participant in the control group, participant 115, and also one participant in the experimental group, participant 118, were subject to confounding variables that affected their results. Controlling for these variables in a scientifically valid way after the results have been

gathered is such a complex task that doing it would likely reduce the validity of the findings altogether. Instead I will break the hypothesis down into the different sets of features to look for more significant results.

Sub-hypothesis
The added planning feature reduces the number of steps customers go through to complete the exchange phase.
The added planning feature does not reduce the number of steps customers go through to complete the exchange phase.

Table i.i: Sub-hypothesis to Hypothesis 1

Is the above sub-hypothesis supported by the results? If we take the average of the steps taken by the two participants that used the planning feature and compare them to the to all the other participants in the experimental group that didn't use the planning feature the results showed that users that used the planning feature used 6.5 steps compared to 9 steps among those who did not use the feature. That is a 38% difference, 18% larger than the effect observed on the parent hypothesis. Nevertheless, the results showed that one of participants, participant 120, that used the planning features had extensive experience with "Finn.no Torget" that must be assumed to be accounting for most of reductions in time. The other participant that used the planning feature, participant 116, is a 23 year old student. It is a generally accept that young students are inherently more skilled to use new technological features than their counterparts, grown ups that are working full time jobs. The results also confirms this by looking at the participant's low cumulative time spent, high customer experience score and low SMEQ score.

So to answer the sub-hypothesis, the results showed that the effect on the number of steps needed to go through the exchange phase was larger for the group using the planning feature compared to the group not using it. However, the results also showed that these effects were caused by the two participants inherent skills with respectively marketplaces and technology in general, and that these factors are better suited to explain the differences in the number of steps. The results thus implicated that the planning feature was not causing the effect that raised reduced the number of steps by 38%.

Returning to the parent hypothesis, the results showed that many participants were not even aware of some of the added features, which is a important finding. When the significant factor that reduced the number of steps by 38% was the skills and habitual behavior of the participants and not the added planning feature, then it also follows that the skill level and habitual behavior of the rest of the participants in the experimental group are the most significant cause of the 20% increase in the number of steps used to complete the exchange phase compared to the control group.

Thus, the added functionality cannot be said to reduce the number of steps customers go through to complete the exchange phase.

Hypothesis H2
The added functionality positively increases customer experience.
The added functionality does not positively increases customer experience.

Table i.i: Hypothesis 2

The second hypothesis asks if the added functionality affects the participants experiences in a positive way.

The results showed that the average customer experience score only varied by 0.1 points between the control group and the experimental group. The results also showed that half of the participants in both groups had an average customer experience score above 4.7, indicating that half of the participants were closer to very satisfied than to any other satisfaction level. The results, specifically the cases about participant 115 and participant 118, proved that the causes of approximately half of the lower customer experience scores in this sample were caused by other effects that the added functionality. Thus the added functionality cannot be said to positively increase in customer. In the same fashion, the added functionality cannot be established as the cause of to why the participants that used more of the added features showed increased average customer experience scores in the result sample.

Nevertheless, it should be mentioned that participant 121's journey could possible have been alleviated by using the features, but one can only speculate to why she did not use them. The participant reported living a stressful daily life, and it could be the reason to both why she didn't notice the added features and also to why she had to go through a large number of steps to complete the exchange process. It would be interesting to investigate how to successfully deliver the added functionality to those with lower average customer experience scores and a higher number of steps than average.

Hypothesis H3
The added functionality is readily used by customers.

The added functionality is not readily used by customers.

Table i.i: Hypothesis 2

The third hypothesis is concerned with the three features that were added to the prototype which was administered to the experimental group.

The features added to the prototype was described in the “Methods” chapter and they were:

- A pickup location feature
- A delivery area feature
- A planning feature

First, the results showed that the pickup location feature was used by 86% of the participants, and it follows that the pickup location feature must qualify as being readily used by the participants in the study sample.
Second, the results showed that the delivery area was used by 29% of the participants in the study sample. This cannot be said to qualify as being readily used by customers if the study sample is somewhat representative of the “Finn.no Torget” customer population.
Third, the results showed that the planning feature was used by 29% of the participants in the study sample, similarly to the delivery area feature, the planning feature cannot be be said to qualify as readily available. This is further supported by the facts presented in the “cases” section of the results and discussed in the first hypothesis.
Finally, the results showed that the added functionality can be said to be partially readily used by the customers.

Sub-research questions
Will non-intrusive pickup locations and a planning feature facilitate easier exchanges with less steps involved for the users of C2C online marketplaces?
To what degree will the addition of pickup locations and a planning feature in C2C marketplace apps reduce perceived hassle and friction during the exchange phase of C2C marketplace transactions?

Table i.i: Sub-research questions

A possible interpretation to the first question is that hypotheses proves that the non-intrusive pickup locations and planning feature does not facilitate easier exchanges with less steps involved for the users of C2C online marketplaces. However, if the features were implemented and used over time, they could possibly facilitate easier exchanges, but at this point in time, none of this thesis results could prove any sure benefit.

Another interpretation is that the features truly are non-intrusive as the results proved that a many participants didn't even notice the added features, and no participants reported that they very negatively affected by the features. As a consequence, there is no harm in implementing them so that one could see if any benefits from the features could show significant effect customers have had time to become familiar with them.

An interpretation of the second question is that the addition of these features cannot be proved to reduce perceived hassle and friction with the results that the study in this thesis generated. The results showed that the users who used the planning features were already skilled at reducing the hassle and friction, and that the users that could have benefitted from the planning features were unable

to notice them. It would be interesting to measure how they would have been affected by the features if they were pushed or forced to use them.

Implications / Significance

My findings brings some interesting implications, for instance, my findings show that that there is often a large discrepancy between what people think they would like to use and what they actually use in real life settings. The results from the Living Lab were an interesting starting point, but were not ideal to use as a starting point for selecting a prototype concept and conducting a study in the scale of this thesis work.

Furthermore, my work brings some significance to the field of research on service design in C2C online marketplace, a largely untouched field of research that is mainly driven by business interests. The significant parts of my work includes the definitions put forward in the theoretical framework, such as the models of a C2C marketplace transaction and the thorough definition of the exchange phase in the same domain. In addition, the prototype that was built is of significance to show how to quickly implement concepts such as those described in the Living Lab study.

Validity

To improve the validity of the findings in this thesis I have made sure to clearly define and operationalize the goals and objectives in the scope chapter, these definitions has been the cornerstone of the work on the thesis. They were

repeatedly revisited in order to make sure that the both the prototype and the study was contributing to the goal of this thesis.

Furthermore, the measures I used were also operationalized with both the goals and objectives in mind. I also gathered valuable inspiration in how to define which measures to collect by using the CJML framework. The framework is backed by peer-reviewed research and has been a great guiding light to ensure that my work remains consistent and as valid as possible.

Unfortunately I did not prioritize to test my measures with similar tried and tested measures, nonetheless I maintained some confidence in the validity of at least the CJML and SMEQ measures.

Limitations

There were some limitations that must be taken into account when interpreting the results and findings of this thesis. For instance, the number of enrolled participants in the study were limited by the amount of time available to the researcher as well as the willingness of volunteers to participate. This might have affected the generalizability and preciseness of the results gathered from the study.

In addition, I used convenience sampling in order to recruit enough participants, it was almost a necessity because of the difficulties with recruiting on the Finn.no platform caused by the spam filters. This might have resulted in the participation of one type of people that would share specific traits, for example extroversy, as they were willing to join the study.

In the study I was only testing the seller's perspective of the prototype and exchange phase. This was a practical limitation I hit when deciding which methods to use and measures to operationalize. I decided to focus on a smaller scope in order to be more confident in trust the results.

Furthermore, the results were limited by my behavior, I could have been acting to kind, thus hiding the true pains that customers are experiencing in the exchange phase. In hindsight, this is something I should have tested before conducting the study.

Finally, the implementation of the prototype has some limitations with regards to additional costs of using apis and development costs. However, the additional costs may be considered negligible when compared to the value they create as these API services are remarkable cheap. Nevertheless, the limitations in question were costs associated with pay-per-use of google API services related to maps, places and geocoding. These API services were used in the implementation to provide location features. Furthermore, the added features should be cost efficient to implement in a real life marketplace. Considering that it took a junior software engineer about 300 hours to develop a fully featured prototype, in addition to the added features, it should reasonable to assume that the costs associated with development of the proposed features should not hinder the use of them. Also, considering that the features merely are add-ons to an existing ecosystem, the costs associated with development would probably be even lower than the above estimate. Hopefully the results of this thesis will remove uncertainty about the value of pursuing this feature.

Conclusion

How can we reduce friction and hassle during the exchange phase of C2C marketplace transactions?

The objective of this thesis was to explore new methods that could reduce hassle experienced during the exchange phase of C2C marketplace transactions. In turn, the resulting methods will presumably help customers solve their problem of communicating and successfully planning C2C marketplace transactions. In addition, to reduce the complexity of the scope I have decided to only focus on the seller's perspective of the exchange phase.

The problems specified above are important for society to solve. Solving them is assumed to increase the participation on C2C marketplaces, in turn leading to more second-hand items in circulation. The redistribution of idling goods is sustainable and has a positive environmental impact (Botsman and Rogers 2011). In addition, C2C marketplaces will likely see a positive impact on user satisfaction, and the individual users will reap the economic and environmental benefits of hassle free trading.

The customers of C2C marketplaces are often unsuccessful at completing transactions due to several issues that arise during the exchange phase. At the time, customers are left without the tools to aid them in dealing with ambiguous agreements and absenteeism at the time of exchange.

My contribution with this thesis was to explore different concepts that could be implemented to aid customers of C2C marketplaces in reducing their struggles and frustrations when partaking in these trading "communities". After selecting a

the most promising concepts, I implemented them in a prototype that mimicked “Finn.no Torget”, a leading Norwegian online marketplace. To validate and confirm whether the implemented concept could alleviate some of the friction points in practice, I also conducted a pseudo randomized field experiment were 11 participants were testing the app on their own cell phones in a real life setting.

The marketplace that I mimicked is a rather traditional, slow moving C2C online marketplace, and it was interesting to investigate whether the proposed planning feature could benefit traditional C2C online marketplaces in some way or not.

The results from this thesis showed that the features that I selected are not ripe enough for use in C2C online marketplaces, at least not just yet, but the in the future they might earn their spot.

Some future work that remains to be done is investigating if the buyer perspective would have more benefit of the features than the seller had during this study. In addition, the features should ideally be tested in a real C2C online marketplace environment where they were tested with an A/B test. That would most likely remove all uncertainty about the effect of the features that I implemented as a part of this thesis.

Appendix


VICTORIA'S SECRET
Pure Seduction
Seduction
VICTORIA'S SECRET


VICTORIA'S SECRET
Love Spell
Love Spell
VICTORIA'S SECRET

Kundereise

BrukerID:

for masterprosjekt.

Kontaktperson:
Nikolai Hegelstad
411 92 665
nikolai@hegelstad.net

Husk å ta med dette skjemaet til det avsluttende møtet.

Opplevelse
(smiley)

Starttidspunkt: : Sluttidspunkt: : Mottok notifikasjon: Åpnet app via notifikasjon:

Beskrivelse

Starttidspunkt: : Sluttidspunkt: : Mottok notifikasjon: Åpnet app via notifikasjon:

Beskrivelse

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Beskrivelse

Starttidspunkt: : Sluttidspunkt: : Mottok notifikasjon: Åpnet app via notifikasjon:

Beskrivelse

Snu arket

118

411 92 865
nikolai@hegelstad.net

Opplevelse (smiley)

Starttidspunkt: : Sluttidspunkt: : Mottok notifikasjon: Åpnet app via notifikasjon:

Beskrivelse
oppstart av 02⁰⁰ - 02¹⁰ 27/7
annonsen

Starttidspunkt: : Sluttidspunkt: : Mottok notifikasjon: Åpnet app via notifikasjon:

Beskrivelse
Endring av (Problemer rapbugs) 28/7
annonsen 11⁰⁰ - 11¹⁰

Starttidspunkt: : Sluttidspunkt: : Mottok notifikasjon: Åpnet app via notifikasjon:

Beskrivelse
Flere annonser 1.33 - 1,40 29/7
"oppe og går"

Starttidspunkt: : Sluttidspunkt: : Mottok notifikasjon: Åpnet app via notifikasjon:

Beskrivelse 6/8 13.13 - 13.20
Endret på annonsen. Godt å skrive meldinger

Starttidspunkt: : Sluttidspunkt: : Mottok notifikasjon: Åpnet app via notifikasjon:

Beskrivelse 8/8 12⁰⁰ - 12¹⁰
meldingssystemet "henger", nesten håpløst å skrive meldinger.

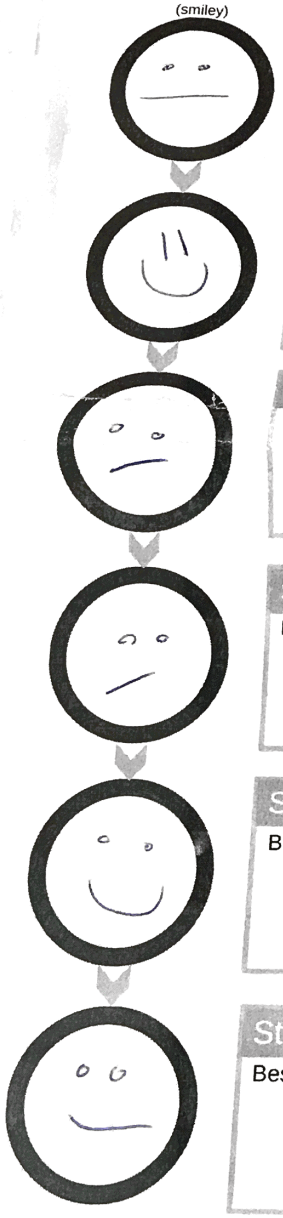
Starttidspunkt: : Sluttidspunkt: : Mottok notifikasjon: Åpnet app via notifikasjon:

Beskrivelse 9/8
Går ledre å skrive meldinger, men så gikk det plutselig tregere igjen...

Snu arket

127

Opplevelse (smiley)



Starttidspunkt: 18:23 Sluttidspunkt: 18:24 Mottok notifikasjon: X Åpnet app via notifikasjon: X

Beskrivelse Positivt med henvendelse, men meldingen gir lite informasjon.

Starttidspunkt: 20:43 Sluttidspunkt: 20:44 Mottok notifikasjon: X Åpnet app via notifikasjon: X

Beskrivelse Bekreftelse, men ingen forslag / initiativ til tidpkt.

Starttidspunkt: 10:00 Sluttidspunkt: : Mottok notifikasjon: X Åpnet app via notifikasjon: X

Beskriveise Lite forståelig henvendelse

Starttidspunkt: 10:23 Sluttidspunkt: : Mottok notifikasjon: X Åpnet app via notifikasjon: X

Beskrivelse svarer ikke, avventer initiativ fra kjøper

Starttidspunkt: 15:58 Sluttidspunkt: : Mottok notifikasjon: Åpnet app via notifikasjon:

Beskrivelse Bekreftelse på møtetidspkt., men fremdeles ikke tydelig på [redacted] kl. slett.

Starttidspunkt: 17:59 Sluttidspunkt: : Mottok notifikasjon: Åpnet app via notifikasjon:

Beskrivelse Meld om forsinket. Passet igrunn bra.

Snu arket

UiO : Institutt for informatikk
Det matematisk-naturvitenskapelige fakultet

CONSERVE SUME

Invitasjon til deltagelse i forskningsprosjekt

Utforsking av nye metoder for å forbedre transaksjonsfasen i markedsplass-apper

Bakgrunn og hensikt
Som en del av prosjektet Conserve & Consume gjennomfører jeg en studie for SINTEF m. partnere som har som mål å forenkle handel på digitale markedsplasser (f.eks. Finn.no, Shpock og Tise). Det har vist seg at mange opplever betydelige utfordringer ved handel på digitale markedsplasser. Utfordringene utarter seg ofte når partene i en handel skal gå til steget hvor de gjennomfører bytte av vare mot betaling. Det er ofte snakk om misforståelser, uklarheter eller avtalebrudd mellom partene som fører til at handler eller bytter aldri finner sted.

Som en del av masteroppgaven min har jeg utviklet en markedsplass-app. Denne prototypen har utvidet funksjonalitet utover hva Finn.no Torget tilbyr. Formålet med denne studien er å finne ut om den utvidede funksjonaliteten reduserer stress- og friksjons-momenter i handel på digitale markedsplasser.

Forskningsstudien er en del av masteroppgaven min og er i samarbeid med bedriftspartnerne SoBo Community, Greenphones, Schibsted Verk og forskningspartnerne Sintef DIGITAL, Universitet i Oslo og Bengler.

Jeg har kontaktet deg fordi du har erfaring med bruk av Finn.no.

Personvern
Jeg (Nikolai Hegelstad) vil være behandlingsansvarlig for personopplysninger i denne studien. Innsamlet datamaterialet vil bli oppbevart på godkjente serverløsninger og vil kun være tilgjengelig for undertegnede gjennom studien. Ved studieslutt (1. Oktober 2018), eller tidligere, vil alle personopplysninger slettes og dataene vil bli anonymisert. Anonymisert datamateriale vil kunne bli brukt innad i prosjektet. Under ingen omstendigheter vil tilgang til dine personopplysninger eller innsamlede data gis til personer utenfor prosjektet.

Frivillig deltagelse
Du kan trekke deg på et hvilket som helst tidspunkt uten å oppgi noen årsak og uten konsekvenser. Du står også fritt til å bestemme om du ønsker at dataene som er samlet om deg skal slettes eller kan brukes videre i studien. Informasjonen du gir vil bli behandlet konfidensielt av alle involverte forskere. Det vil si at all data vil bli anonymisert før brukt i presentasjoner og publikasjoner, og ikke vil kunne spores tilbake til deg som enkeltperson.

Hva innebærer studien?
Å delta i studien innebærer at du blir tildelt én av to oppgaver: du skal gjennomføre en handel med (1) Finn.no-appen eller (2) med en ny prototype som installeres på telefonen. I begge tilfeller vil handelen foregå med meg som kjøper, og du vil få utdelt gjenstanden du skal selge. For at handlene skal være så reelle som mulig er det derfor ønskelig at du har tid til å møtes for å gjennomføre handelen.

Kort tid etter at handelen er gjennomført vil du møte meg for å evaluere prosessen. Dette er opplysninger jeg skal benytte i analysen av de to forskjellige løsningene. I tillegg vil det bli anledning til å kommentere og stille spørsmål.

Nærmere forklaring på hva studien innebærer

- Kriterier for deltagelse
  - Du må være kjent med bruk av Finn.no Torget på mobil.
  - Du må ha forsøkt å gjennomføre minst 3 eller flere handler på Finn.no Torget.
  - Du må være bosatt i Oslo.
- Prosedyrer for å trekke seg fra studien
  - Du må selv ta kontakt med studieansvarlig dersom du ønsker å trekke deg.
  - Om du har fått app installert sletter du selv appen fra mobiltelefonen.
  - Om du gjennomfører salg i Finn.no-appen sletter du selv samtalen.
  - Studieansvarlig sletter samlede data om deg dersom du har forespurt det.
- Tidsplan
  - Studien (og medfølgende handel) foregår mellom **man. 9. Juli** og **søn. 15. Juli**.
  - Etter å ha takket ja til å delta setter vi opp et tidspunkt hvor vi møtes for å gå gjennom studiens detaljer, eventuell installasjon av applikasjon og signering av samtykkelse til studiedeltagelse. Du får utdelt et ark hvor du skal notere informasjon om stegene i handelen. Utfylling tar maksimalt 3 minutter per steg i handelen. Du vil også få utdelt gjenstanden du skal selge på appen.
  - Etter møtet vil du opprette en salgsannonse på app med utdelt gjenstand.
  - Studieansvarlig vil opptre som interessert/kjøper på denne annonsen og du vil opptre som selger. Det vil være mulig å gjennomføre handelen i ditt eget tempo slik som du ville gjort ellers.
  - Når vi har møttes for å fullføre handelen vil vi i løpet av de to neste dagene ha et avsluttende møte på 30-60 minutter hvor vi evaluerer handelen.
- Deltagerens ansvar
  - Fylle ut et skjema underveis i studien som leveres på slutten av studien.
  - Møte opp på avtalt møte på starten og slutten av studien.
- Kompensasjon
  - Gavekort på 300 kr.

Rettigheter til tilgang og sletting av dataene samlet om deg
Dersom du deltar i studien har du rettigheter til å få tilgang til data som er blitt samlet om deg. Du har også rettigheter til å få data om deg slettet både under og etter studien uten å oppgi årsak. Dette med mindre dataen allerede er tatt i bruk i analysen av dataene.

Informasjon om utfallet av studien
Du har mulighet til å motta informasjon om utfallet av studien ved forespørsel om dette.

Har du spørsmål ang. prosjektet eller studien, ta kontakt med Nikolai Hegelstad pr. e-post (nikolheg@ifi.uio.no) eller telefon (411 92 665).

Samtykke for deltagelse i studie

Jeg er villig til å delta i studien.

_____
(Signert av studiedeltager, dato)

Jeg bekrefter at jeg har gitt informasjon om studien.

_____
(Signert av studieansvarlig, dato)

Personalia		**Meetings**			
Identifier		Briefing date			
Name		Debrief date			
Telephone					
Email					
Age					
Postal code					
# of Sales					
Occupation					
Device					
Group					
Label	Touchpoint type	Touchpoint time	Touchpoint duration	Diary note	Rating
T1					
T2					
T3					

Personalia				**Meetings**	
UserID	117			Initial meeting	2018-08-08
Name				Debrief meeting	2018-08-13
Telephone					
Email					
Age	30				
Group	Finn.no				
Device	iPhone				
Journey summary					

Label	Touchpoint type	Touchpoint time	Touchpoint duration (min)	Diary note	Rating
T1	redigerte annonse	8. Aug 19:42	3	La ut annonse på finn, som vanlig.	5
T2	meldingsutvekslin	10. aug 21:17	1	Positiv interesse rundt produktet.	5
T3	meldingsutvekslin	11. aug 21:04	2	Kunden ønsker å kjøpe produktet. Spør om det skal sendes eller hentes.	5
T4	meldingsutvekslin	11. aug 22:21	3	Kunden vil hente. Spør om dag/tid. Foreslår også morgendagen.	5
T5	meldingsutvekslin	12. aug 15:03	1	Ok. Spør på nytt om når det passer for kunden å komme.	5
T6	meldingsutvekslin	12. aug 17:16	1	Avtalt dag og tid for overleving av gavesett.	5
T7	møte	13. aug 18:03	5	Møter kunden som har kommet for å kjøpe gavesettet.	5

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