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Building trust in online grocery shopping

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Abstract

Online grocery shopping is an increasing trend in many countries. Several studies have been done to investigate different aspects of online grocery shopping. Researchers have found that the likelihood that there will be something wrong with the product, called product risk, is prominent in online grocery shopping services. The product risk is especially associated with perishable products. However, knowledge on how online grocery services can reduce product risk is limited. Furthermore, there is a need for identification of trust building factors, which in turn might help increasing customers' trust when buying groceries online.

The overall objective of this research project is to investigate how to increase customers' trust when buying perishable products online. Through design, prototyping, and evaluation activities, we explore how to increase customers' perception of the ability of the person collecting groceries, as a way to build trust. This is done through the enabling of a variety of user feedback types such as ratings, comments, and presence. The research project combines technology research with service design thinking. The combination of these two is used in the design process of creating and exploring several concepts, customer journey maps, and prototypes. The prototypes are evaluated through group interviews and usability testing followed by interviews related to trust.

Our results are in line with findings of the previous studies that found product risk to be a major risk associated with buying perishable products online. Our results extend this knowledge by identifying social risk as an important factor present among customers who are asked to give feedback on online services. Based on the results from our design and evaluation process, we propose design implications useful for researchers, designers, and developers concerned with the development of services in the context of online grocery shopping. Furthermore, we present lessons learned about adapting technology research to fit the creation of services, lessons learned when using future workshop as a method in service design, and lessons learned when working with service design and prototypes that might be useful to both the researchers and practitioners working in service design field.

Keywords: *Trust, ability, product risk, social risk, feedback, rating, technology research, service design thinking, prototypes, online grocery shopping*

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Oslo, May 2017
Kristoffer Holm
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1. Introduction

1.1 Motivation

Buying groceries online is an increasing trend. A survey based on online respondents from 60 countries showed that one-fourth of respondents report buying groceries online, whereas more than half (55%) are considering doing it in the future (Nielsen, 2015). Researchers have mostly studied online shopping in general, but the research on online grocery shopping is now emerging as a new area of interest. The experience of buying groceries online differs from online shopping in general because of the perishability and variability of the products. People may hesitate to shop perishable groceries online because of the perceived risk of receiving products that do not meet their expectations (Mortimer, Fazal e Hasan, Andrews, & Martin, 2016). We, therefore, want to explore different strategies for increasing trust in online grocery shopping. Through the development of prototypes, we work with the challenges related to product risk and social risk, in the context of online grocery shopping.

1.2 Research context

This master thesis is written by two master students from the Department of Informatics at the University of Oslo[1]. The master thesis is prepared in cooperation with SINTEF[2], the Center for Service Innovation (CSI)[3], and the grocery retailer NorgesGruppen[4]. In this master thesis, we refer to NorgesGruppen as AB Food.

This project is part of CSI's research called "design for service." Service design is central to service innovation because it covers the whole process of a new service development and the whole way of approaching a firm's delivery of added customer value. (CSI - Center for Service Innovation, n.d). Before the research project began, AB Food launched the beta version of its online grocery store. AB Food wanted to evaluate *Cartpooling*, a C2C service that was supposed to improve the beta version of AB Food's online store. We saw this as a possibility to work with service design to increase customers' trust in online grocery shopping. The outcome of our work will result in new or improved services and prototypes

1 https://www.mn.uio.no/ifi/
2 http://www.sintef.no/
3 https://www.nhh.no/en/research-centres/csi/
4 http://www.norgesgruppen.no/

that represent new knowledge of general interest. The services and prototypes can also be implemented by AB Food.

Several studies on trust have been done in the context of online grocery shopping (e.g. Bhatnagar et al., 2000; Citrin et al., 2003; Nepomuceno et al., 2014). There have been studies (e.g. Leitner & Grechenig, 2008) that have identified success factors for building trust in C2C services and online shopping. However, these success factors have not been identified for online grocery shopping. We want to explore how to build trust in online grocery services by increasing one of the factors of trustworthiness: ability. Ability is known as competence, the skills, or "can-do" and "will-do" components that the person being trusted shows (Mayer, Davis, & Schoorman, 1995).

1.3 Objective

The main objective of this master thesis is to:

- Increase the understanding of customers' trust in online grocery shopping. We focus on how to increase the perceptions of the ability of the person collecting groceries.

To address the main objective, we pose the following sub-objective:

- Create prototypes to extend the understanding of risks associated with online grocery shopping and explore ways of enabling customers to provide feedback to the person collecting groceries

1.4 Research question

How to increase the trustor's perception of the trustee's ability to collect groceries for online orders?

In our context, the trustor is the customer who orders the groceries online. The trustee is the person collecting the groceries delivered to the customer. The ability to select groceries means collecting groceries of high quality, in accordance with the customer's preference.

To address the research question, we develop several prototypes. The prototypes we develop are based on results from the different studies conducted throughout the project. In all of the

studies, we work closely with stakeholders such as executive and non-executive employees, customers, designers, and developers. In addition, we use inspiration from empirical studies and related work. The prototypes are evaluated through group interviews and usability testing, followed by interviews related to trust.

1.5 Contributions

This master thesis contributes to the following:

1. Increase understanding of risks experienced by customers of online grocery services
2. Develop and evaluate prototypes to increase trust in online grocery shopping
3. Propose design implications for increasing trust
4. Adapt technology research to fit the creation and evaluation of services

1. Increase understanding of risks experienced by customers of online grocery services

This research contributes to an increased understanding of risks related to online grocery services. Our research confirms previous research that found product risk to be a major risk in online grocery shopping. In addition, our research extends this knowledge and finds that social risk is present among customers who are asked to give feedback on online grocery B2C and C2C services.

2. Develop and evaluate prototypes to increase trust in online grocery shopping

Another contribution is the development and evaluation of prototypes. The prototypes increase knowledge on how to increase customers' perceptions of the employees' ability to collect groceries. The prototypes allow customers to give feedback in order to increase the employees' knowledge and ability.

3. Propose design implications for increasing trust

We propose design implications for increasing trust and reducing product risk and social risk in the context of online grocery shopping, based on our findings. The design implications we present include *provide more detailed information products about perishable products, allow open-ended questions for user feedback* and *design for efficiency*. The design implications are useful for researchers, developers and designers developing online grocery services.

4. Adapt technology research to fit the creation and evaluation of services

The novelty of our approach is in adapting the research approach named technology research to fit the creation and evaluation of services. Technology research is concerned with the development and evaluation of artifacts. In this research project, we have developed a service. Therefore, we see a need for adapting the scientific approach. The contribution was made through a combination of technology research and the interdisciplinary design approach of service design thinking.

1.6 Chapter overview

Chapter 2 Literature Review	This chapter gives an overview of the field of trust and risk in online grocery shopping. We review empirical studies on trust and risk in online grocery shopping and present related work relevant for our thesis.
Chapter 3 Methods	Chapter 3 gives an overview of the different scientific approaches and design approaches relevant for our work. We have emphasized technology research and service design, as these are the approaches we have chosen for this project. We also present methods and techniques relevant for our project.
Chapter 4 Design process	Chapter 4 gives an overview of our design process. It presents the process of idea generation through methods and tools used in the first two phases of the design process.
Chapter 5 Prototyping and evaluation	In this chapter, we present the prototypes we developed. In addition, we present the evaluation of the prototypes.
Chapter 6 Discussion	In chapter 6, we discuss and reflect on our findings related to trust. We also discuss lessons learned concerning the approaches and methods we have used.
Chapter 7 Conclusions and future work	This chapter gives a summary of the contributions of this research and provides ideas for future work.

2. Literature review

In this chapter, we give a review of the literature related to the fields of trust, risk, and online grocery shopping. We start by presenting definitions of trust and risk in section 2.1. Then, we relate the concepts of trust and risk to online grocery shopping in section 2.2. The empirical studies conducted on these fields are presented in section 2.3. Section 2.4 gives an overview of services relevant to our research. In section 2.5, we summarize this chapter.

2.1 Trust and risk

Trust is a difficult term to define because it is such a broad concept. It is defined in several different ways and every discipline views trust from its own unique perspective. For this reason, McKnight and colleagues (2001) analyzed all the existing trust definitions. In their analysis, they found that the definitions could be divided into two broad groupings. The first one was different conceptual types and refers to what type of construct trust is. Examples are attitudes, beliefs, behaviours, and dispositions. The second grouping was different referents, which refers to the object of trust and can be trust in something or someone or trust in a specific characteristic of someone.

Research done by Mayer et al. (1995) primarily focuses on organizational trust. Their work has influenced trust literature in general (e.g. McDermott, 2012; McKnight & Chervany, 2001; Saunders & Thornhill, 2011). Mayer et al. (1995) defined trust as:

> […] the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party. (p. 712)

Mayer et al. elaborated, "Making oneself vulnerable is taking risk. Trust is not taking risk per se, but rather it is a willingness to take risk." To explain the different aspects of trust, Mayer et al. (1995) made an integrative model of organizational trust. This model explains how the relationship between factors of perceived trustworthiness and the trustor's propensity influences trust. It further explains that the amount of trust needed is influenced by the perceived risk before entering the risk-taking relationship. When the particular action is carried out and the risk-taking relationship ends, the trustor evaluates the outcome which influences the factors of perceived trustworthiness and either strengthens the trust or weakens the trust, depending on the outcome of the risk-taking relationship.

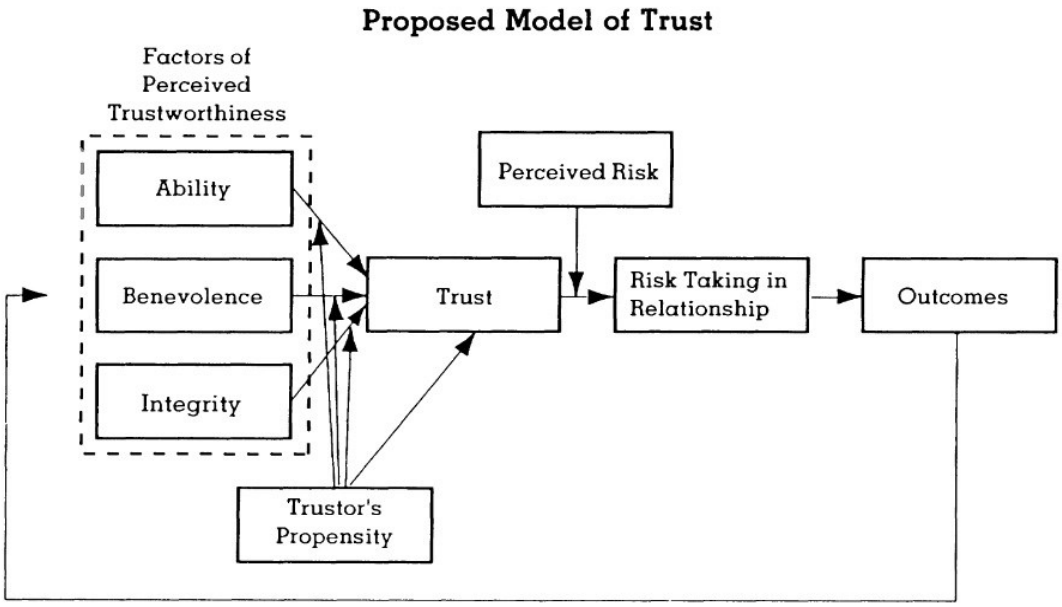

Figure 1 Mayer et al. (1995, p. 715) integrative model of organizational trust.

We will briefly explain the important terms related to the model: Trustor, trustee, trustor‘s propensity, the different factors of perceived trustworthiness, perceived risk, and risk-taking.

The model focuses on trust between two specific parties, the trusting party (*trustor*) which is vulnerable, and the party to be trusted (*trustee*), which carries out the particular important action. The *trustor's propensity* is the trustors "[...] generalized willingness to trust others" (Mayer et al., 1995, p. 715), this factor influences the likelihood that the trustor will trust any trustee before knowledge about the particular trustee is available. The trustor's propensity varies depending on experience, background, and other factors. An extreme case of propensity is called blind trust. The propensity to trust is also called personality-based trust by Gefen and colleagues (2003). In the integrative model, Mayer et al. (1995) identify three factors of trustworthiness that contribute to trust. Ability, also known as competence or perceived expertise, is the skills or "can-do" and "will-do" components that the trustee shows within the domain which the trustee is to be trusted. Benevolence "… is the extent to which a trustee is believed to want to do good to the trustor, aside from an egocentric profit motive" (Mayer et al., 1995, p. 718). Integrity is that "[…] the trustee adheres to a set of principles that the trustor finds acceptable" (Mayer et al., 1995, p. 719). Integrity and benevolence are similar constructs that can be classified as the "will-do" components of trustworthiness (Colquitt, Scott, Lepine, & Zedeck, 2007). Inspired by Mayer et al. (1995), Lee and Turban (2001) propose that the trustworthiness antecedents of an Internet merchant consist of ability, integrity, and benevolence. D. Kim and Benbasat (2003) derive these antecedents into issues

that are more specific. Potential issues related to ability can be the merchants' lack of knowledge and resources. The consequences can be that the merchants cannot provide quality products, low prices, on-time delivery, after sales support (cancel/return/maintenance), secure handling of sales transactions, personal information protection, advice or information.

Trust research identifies four trust antecedents (Gefen et al., 2003, pp. 62-63, 65):

- Knowledge-based trust, which helps the trustors to predict the outcome, based on knowledge about the trustee. This knowledge can be built over time through familiarizing with the trustee and can be built on previous successful encounters.
- Cognition-based trust, which describes how a trustor evaluates a trustee's trustworthiness based on first impression rather than experience or interaction, by observing cues to confirm the trustee's trustworthiness.
- Institution-based trust, which is divided into two types. One is situational normality, which assesses whether an outcome will be a success based on how normal a situation appears. To evaluate if a situation is normal the trustor does not need knowledge about the actual trustee, just knowledge of similar contexts. The other type is structural assurances or safeguards, which refer to safety nets such as legal recourse, guarantees, and regulations.
- Personality-based trust, see trustor's propensity.

Lee and Turban (2001) claim that trust is related to risk, and any study on trust which does not examine the relationship between these two is considered to be incomplete. Harridge-March (2006) says that the opposite, that any study on risk which does not study trust, might also make a study incomplete. Jacoby and Kaplan (1972) have identified seven different areas related to risk: financial, performance, physical, psychological, social, time, and opportunity cost. They give definitions of five of the risk areas, as presented below:

- Financial risk: "What are the chances that you stand to lose money if you try an unfamiliar brand of __ (either because it won't work at all, or because it costs more than it should to keep it in good shape)?" (Jacoby & Kaplan, 1972, Table 1)
- Performance risk: "What is the likelihood that there will be something wrong with an unfamiliar brand of __ or that it will not work properly?" (Jacoby & Kaplan, 1972, Table 1). Some researchers have called performance risk for product risk (e.g Bhatnagar, Misra, & Rao, 2000; Huang & Oppewal, 2006). We mainly use the term product risk in this master thesis.

- Physical risk: “What are the chances that an unfamiliar brand of __ may not be safe; i.e., may be (or become) harmful or injurious to your health?” (Jacoby & Kaplan, 1972, Table 1)
- Psychological risk: “What are the chances that an unfamiliar brand of __ will not fit in well with your self-image or self-concept (i.e., the way you think about yourself)?” (Jacoby & Kaplan, 1972, Table 1)
- Social risk: “What are the chances that an unfamiliar brand of __ will affect the way others think of you?” (Jacoby & Kaplan, 1972, Table 1)

2.2 Perceived risk in online grocery shopping

When deciding whether to shop groceries online, it is argued that customers will weigh their levels of trust against their levels of perceived risk. Therefore, one needs to see trust and perceived risk in relation to each other (Mortimer et al., 2016). When a customer is not physically present in the store and cannot verify the quality of the products, uncertainty and risk arise and the need for trust grows (McKnight & Chervany, 2001). This risk is especially prominent for online grocery shopping. Before making a purchase, people generally prefer to verify the quality of groceries such as fruits and vegetables, which belong to the see/touch/smell category (Baker, 2000; Citrin et al., 2003; Ernst & Young, 1999, in Huang and Oppewal, 2006, p. 12). However, people cannot verify the quality of these products when shopping online. As Huang and Oppewal (2006) point out, some e-merchants claim their products to be fresh and of high quality, but each customer may have different preferences, and consequently, their expectations may not become fulfilled.

Although the prevalence of shopping groceries online is increasing steadily, there are still some people who are reluctant to do it. According to Nepomuceno, Laroche, and Richard (2014), there are several factors that may explain the resistance of customers to online shopping. Perceived risk is one of them and it plays an important role when buying online because of the insecurity in the situation of the purchase decision. This may derive from the perception that online tangible products might be perceived as intangible ones because consumers are not having direct contact with the products being purchased (Peterson et al., 1997 in Nepomuceno et al., 2014, p. 619). The online setting thus increases the intangibility of physically tangible products. Even though the provision of information can “tangibilize” the intangible, the online setting is seen as more intangible than other traditional settings because one cannot touch, feel, or smell the items on the website (Nepomuceno et al., 2014).

This intangibility impacts perceived risk, which is an important barrier for users considering shopping online. D. J. Kim, Ferrin, and Rao (2008) define perceived risk as "a consumer's belief about the potential uncertain negative outcomes from the online transaction" (p. 546).

Perceived risk consists of the two components uncertainty, which is the likelihood of unfavourable outcomes, and consequences explained as the importance of a loss, according to Bauer (1960, in Laroche, Yang, McDougall, & Bergeron, 2005, p. 254). Out of the seven types of risks identified by Jacoby and Kaplan (1972), Bhatnagar et al. (2000) claim that financial risk and product risk are the two types of risk that are predominant in online shopping. Bhatnagar et al. explain product risk as being associated with the product itself and relate it to whether the product lives up to the consumer's expectations. They further claim that product risk will be higher for products where touch and feel are central. They use food as an example of a product category with high risk because the consumer has to touch and feel the product in order to determine its freshness. The intangibility can be seen through product risk, which Mitchell (1999, in Nepomuceno et al., 2014) explains as the potential loss which occurs by the failure of a product to perform as expected. Users, who are not able to physically examine the products when shopping online, may be concerned that the products do not meet their expectations (Nepomuceno et al., 2014).

According to Nepomuceno and colleagues (2014), there are several factors that may reduce the perceived risk of shopping online. One of them is to give users more information about a product so that the users can be more confident buying it online. Expertise may compensate for not being able to touch the product. Bhatnagar et al. (2000) claim that there is a correlation between consumers' knowledge and their perception of risk. When consumers gain more knowledge, their perception of product risk decreases. Another factor mentioned by Nepomuceno et al. (2014) is that products from familiar brands may reduce the perceived risk because the user already knows what to expect from a product that is familiar to him or her.

Harridge-March (2006) claims that feedback mechanisms may reduce risk and encourage trust. When someone reads or hears about an online marketer from a person whose opinion they care about, it is likely that their opinion will create trust. However, this type of feedback system has also proved to be successful in cases where the customers do not know each other or have not met, such as for the organization eBay. Peterson and Behfar (2003) suggest that

negative performance feedback can induce negative performance in groups before the group has established trust. They also suggest that strongly positive feedback, on the other hand, may improve performance and reduce conflict.

2.3 Empirical studies of trust and risk in an online environment

Several studies have been done to explore the antecedents of perceived risk in an online environment. Most of the studies presented in this section are related to business-to-consumer (B2C) services, but we also present some studies on customer-to-customer (C2C) services. Lee and Turban (2001) proposed a model inspired by the model of trust presented by Mayer et al. (1995) and modified it for use in an online shopping environment. The model investigates four antecedents of trust in Internet shopping: trustworthiness of the Internet merchant, the trustworthiness of the Internet shopping medium, Internet shopping contextual factors, and other factors, i.e. previous experience. The model provides a framework for empirical research on the topic of online consumer trust. Based on this model and other studies, D. Kim and Benbasat (2003) developed a framework to identify the key trust-related issues. The issues were divided into four categories: personal information, product quality and price, customer service, and store presence.

Nepomuceno and colleagues (2014), did the first study showing how intangibility, product knowledge, brand familiarity, privacy, and security concerns affect perceived risk. Their findings showed that when interacting with intangibility (i.e., in online shopping), product knowledge reduces the perceived risk more than brand familiarity.

Bhatnagar and colleagues (2000) found that product risk is depended on which product category an item belongs to. Some products are perceived as less risky than others, such as music and CDs. One of the reasons could be that with these products one can be more certain of the quality of the product. On the other side, some products are experienced as more risky, such as more expensive electronics or products that require touch and feel, like food, because one wants to examine freshness. Huang and Oppewal (2006) have also studied product risk, which they see as highly relevant to online grocery shopping. They place groceries such as fruits and vegetables in the see/touch/smell category and discuss that customers cannot physically examine these products in an online environment. The fact that consumers have

different preferences may lead to the risk that the received products do not meet their expectations. In addition, since online shopping separates purchase from delivery, the users may risk not receiving the products in time (Huang & Oppewal, 2006).

Research by Citrin, Stem, Spangenberg, and Clark (2003) examined how customers have a need for tactile input and that this affects their likelihood of buying products online. Citrin and colleagues' study showed that because of this need, the need for tactile products impacts online shopping negatively. They also found that the types of products that are more impacted are the ones that require sensory inputs other than sight or sound.

A study done by Gefen et al. (2003) showed that consumer trust is as important as perceived usefulness and perceived ease of use, which are a part of the use-antecedents in the Technology Acceptance Model (TAM). The study also suggested that customers' belief that they will not be scammed, safety mechanisms on the website, and a typical and easy-to-use interface, build trust.

Corbitt, Thanasankit, and Yi (2003) found that trust, as a critical factor in e-commerce, is influenced by e-commerce reputation in general, the consumers, and the specific e-commerce website. Their research suggests that people are more likely to purchase from the web if they perceive a higher degree of trust in e-commerce and have more experience using the web.

A study of a carpool service called Bla Bla Car examined how profile information increased trust among the users of the service. When the users ranked how much they trusted people, Mazzella and Sundararajan (2016) found that 88% had high trust in members with a full profile. 92% had high trust in friends and just 58% had high trust in colleagues. This shows that use of feedback helped in increasing trust between members of the service.

Other studies support that feedback increases trust. For example, Sapienza and Korsgaard (1996) found that frequent and timely feedback increases trust between entrepreneurs and venture capital investors. In a study of nursing managers using anonymous staff feedback, Kagan, Kigli-Shemesh, and Tabak (2006) found that giving anonymous feedback increased trust in the organization and its managers.

Studies have also been done on C2C services, one of them by Leitner and Grechenig (2008), who analyzed collaborative shopping networks. They identified trends and determined success factors of said trends. These trends have influenced B2C and C2C e-commerce, providing new shopping concepts under the term "social commerce", which means that the web is regarded as being participative, enabling users to interact and share data with each other. An example of how it has influenced online services is through crowdsourcing, coined by Howe (2006), referring to the outsourcing of tasks to voluntary online users, and user generated content. In e-commerce, the latter term is named consumer-generated content. The analysis of different social e-commerce services has resulted in the identification of different categories for these services. Leitner and Grechenig (2008) found common functions used in the different categories of services, such as customizable user profiles, product images, product rankings, product ratings, and product reviews.

In crowdsourcing contexts, researchers have studied the importance of trust between participants. Leimeister, Huber, Bretschneider, and Krcmar (2009) found that repeated interactions and positive feedback increased trust between participants. Chen, Zhang, and Xu (2009) have studied two types of trust in C2C e-commerce; mutual trust between the members and the member's trust in the platform provider. In C2C e-commerce such as eBay, the platform provider is a middleman and offers members nothing other than a platform to share services. The members buy and sell products to each other and therefore the platform plays only a supportive role. As such, the most important form of activity is the interaction between members and not the interaction between members and the platform provider.

> The present study suggests that in online communities, interpersonal trust is often mutually held by members at the group level. Such trust is very important to C2C platform providers because it is the basis for members to conduct repeated economic exchanges in the long term (Chen et al., 2009, p. 163).

Study	Main findings
Lee and Turban (2001)	Proposed a model investigating four antecedents of trust in online shopping. The model provides a framework for research on the topic of online consumer trust.
D. Kim and Benbasat (2003)	Identified trust-related issues that can be divided into the four categories: personal information, product quality and price, customer service, and store presence.
Nepomuceno et al. (2014)	When interacting with intangibility (online shopping), product knowledge reduces the perceived risk more than brand familiarity.
Bhatnagar et al. (2000)	Product risk depends on which product category the product belongs to. Some products are perceived as riskier than others are.
Citrin et al. (2003)	Buying tactile products impact online shopping negatively, especially products that require sensory inputs beyond sight or sound.
Gefen et al. (2003)	Consumer trust is as important as perceived usefulness and perceived ease of use. Safety mechanisms build trust.
Corbitt et al. (2003)	People are more likely to purchase from the web if they perceive a higher degree of trust in e-commerce and have more experience in using the web.
Mazzella and Sundararajan (2016)	Using feedback helps to increase trust between members of the service.
Sapienza and Korsgaard (1996)	Frequent and timely feedback increases trust between entrepreneurs and venture capital investors.
Kagan et al. (2006)	Giving anonymous feedback increases trust in the organization and its managers.
Leitner and Grechenig (2008)	Analyzed different collaborative shopping networks and found their trends and success factors.
Leimeister et al. (2009)	Repeated interactions and positive feedback increase trust between participants.

Chen et al. (2009)	Mutual trust between members of C2C e-commerce platforms is important to ensure members repeat economic changes over time.

Table 1 Overview of empirical studies on trust and risk in online environments

2.4 Related work

There are several services already available on the online grocery shopping market. This section presents some of the services we find most relevant for our thesis. Some of the services we present are related to groceries, while others are related to crowdsourcing services using trust-mechanisms such as feedback.

Kolonial.no is a Norwegian online grocery store that was started in 2003 by Norwegian entrepreneurs. Kolonial offers groceries and meals, either delivered home or to a pickup point (Kolonial.no, n.d). The world's first self-driving grocery store was demonstrated by Kolonial in 2016. The idea is that the customer can order groceries online through an app and have them delivered by the self-driving vehicles. When the self-driving grocery store arrives, the customer can access it through the mobile phone and retrieve the groceries (Tenold, 2016).

Amazon Go is a new kind of store, which gives a checkout-free experience. The Amazon Go app enables users to enter a store, take the products they want, and leave without paying at a cash register. The shopping technology uses the same kind of technologies as in self-driving cars (computer vision, sensor fusion, and deep learning). It automatically detects when products are removed from or returned to shelves and keeps them in a virtual shopping cart (Amazon, n.d.). This means that the user saves time waiting in line and paying for the products at the cash register. However, the users still have to use time to do the actual shopping.

Vigo is a sharing economy service that helps customers shop groceries for each other. The C2C service is provided by Rema1000 Denmark. Customers located close to each other can request others to shop for them, or they can choose to shop for those who request it. The customer who shops for others gets a small reward for the work. To build trust, the customers rate each other after the order is fulfilled (Rema 1000.dk, n.d).

There is a growing market in meal box delivery and there are several reasons for the success of these services. First, the services make it easier for customers, who can reduce the number of visits to the grocery store because they can get groceries delivered home. Second, these services deliver ingredients to recipes for a given number of meals throughout the week and rationing ingredients accordingly. In Norway, there are several meal box delivery companies, such as Adams Matkasse, Godt Levert, Kolonihagen, etc. (Business Insider, 2016).

FINN Småjobber[5] is a C2C marketplace service for buying and selling services. The services are exchanged between private individuals (FINN.no, n.d-a). This means that the communication and actions take place between two private parties, and FINN is only the platform provider. After a service has been conducted, both parties can write a review of each other, and the review will be linked to the users' profiles (FINN.no, n.d-b).

eBay is a marketplace service for selling and buying products between members of the platform. eBay offers a reputation system which is named the Feedback Forum. It enables the buyer and seller to give each other a rating (1, 0, or -1) or comment on how they perceived the trading after a transaction has been completed. The feedback points are made visible on the users' profiles. Resnick, Kuwabara, Zeckhauser, and Friedman (2000) explained that feedback can be used for future transactions. Users who do not have experience with buying from a particular seller, tend to check the seller's history before making a purchase decision. Therefore, sellers strive to behave in a way that ensures positive feedback.

2.5 Summary

There have been several studies on trust in the context of online grocery shopping (eg. Bhatnagar et al., 2000; Citrin et al., 2003; Nepomuceno et al., 2014). Previous studies have found that product risk is present in online grocery shopping, especially related to perishable products. Studies have explored how to solve this issue, and suggestions have been made. One of the suggestions to reduce product risk is to give users more information about the products (Nepomuceno et al., 2014). Another suggestion is to use feedback mechanisms (Harridge-March, 2006). However, there is a lack of studies on services addresses the issues of trust and product risk in an online grocery environment. There is a need for services that seek to increase the trust of buying perishable products online.

[5] In English "Finn Small jobs"

Studies (e.g. Leitner & Grechenig, 2008) have identified success factors for building trust in C2C services and online shopping. However, there is a lack of studies identifying these success factors in online grocery environments. Several new grocery and C2C services have been launched over the recent years. Some of these services (e.g. Vigo or Amazon Go) use mechanisms for trust, such as ratings. Until now, there have been few studies on these new services and their effects on trust.

3. Methods

This chapter gives an overview of different scientific and design approaches, with an emphasis on the ones we will choose for our project. We also include different variations of the data collection methods we will use, in addition to design techniques. Later, we present validity and reliability of data. Then we will discuss data analysis and finally ethical considerations.

3.1 Scientific approach

There are several ways of classifying science. In this section, we give an overview of the four scientific approaches we found relevant for our work. Solheim and Stølen (2007) list three of the scientific approaches: classical research, technology research, and action research. In addition, Zimmerman and Forlizzi (2014) presents the scientific approach of research through design, which will be presented in this section. Solheim and Stølen (2007) compare the three scientific approaches they have described and explain that they can be applied using the same procedure. In addition, we compare action research and research through design.

"Classical research is research focusing on the world around us, seeking new knowledge about nature, space, the human body, the society, etc. The researcher asks: *What is the real world like?*" (emphasis in original; Solheim & Stølen, 2007, p. 3). Classical research is often used in basic research where the purpose is to obtain new knowledge. Similarly, the goal of classical research is to obtain knowledge about the real world, based on previous theories that are either supported or challenged by the current researchers. The theory is formed through questions that the researcher wants answers to, and is supported by a hypothesis that seeks to build support for the theory. It is important to evaluate a hypothesis to find out if the explanations are true, and this is often done through experiments and observations. When evaluating the hypothesis it is important to consider the principle of falsifiability. This means that if observations show that it is possible to reject the hypothesis, the hypothesis is considered falsifiable (Solheim and Stølen, 2007).

Solheim and Stølen (2007) describe the three iterative stages of classical research:

1. Problem analysis. Identifying a need for a new or better theory. The need is caused by a lack of theory, or because there is a mismatch between reality and the existing theory.

2. Innovation. New questions are created to replace or extend the existing theory. The overall hypothesis is that the new explanation is true.
3. Evaluation. The researcher evaluates the overall hypothesis/new explanation to examine whether it can be supported.

Technology research is concerned with how to produce new or improved artifacts, which represents new knowledge of general interest. This approach is more used within applied research, which seeks solutions to practical problems. Within technology research, the goal is not to find support for theories but to confirm hypotheses or predictions about a product or prototype through an evaluation. Technology research adopts the scientific way of iteratively creating knowledge, through evaluation and improvement of an artifact (Solheim & Stølen, 2007).

The three main stages of the iterative process of technology research are (Solheim & Stølen, 2007):

1. Problem analysis. Involving stakeholders in identifying a potential need for a new or improved artifact.
2. Innovation. Creating artifacts which seek to satisfy the potential need.
3. Evaluation. Predictions about the artifacts are made to test if they satisfy the need.

In the problem analysis, the researcher starts with gathering requirements from new or future possible users, in addition to other stakeholders. Then the researcher creates an artifact with the aim of satisfying the requirements. The researcher needs to prove that the artifact actually does satisfy the need. The hypothesis is that the artifact satisfies the need. At the end, the researcher conducts an evaluation. This is done by formulating predictions about the artifact, followed by an evaluation to find out if the predictions are true and the artifact satisfies the need (Solheim & Stølen, 2007).

Solheim and Stølen (2007) compares classical research and technology research. Below is a table illustrating the similarities between classical research and technology research.

Elements	**Classical research**	**Technology research**
Problem	Need for new theory	Need for new artifact
Solution	New explanations (new theory)	New artifact
Solution should be	Relevant part of the real world	Relevant need

compared to...		
Overall hypothesis	The new explanations agree with reality	The new artifact satisfies the need

Table 2 Comparison of Classical research and Technology research. (Solheim & Stølen, 2007, p. 11)

Both of the approaches start with a need. In classical research, there is a need for a new theory, while in technology research there is a need for a new artifact. In both research approaches, the goal is to create something that satisfies a need. In classical research, the desired solution is that the new explanations lead to new theory. The desired solution in technology research is a new or improved artifact (Solheim & Stølen, 2007).

The goal of action research is to solve or reduce organizational or social problems by doing changes within the organizations. After the changes have been done, the researcher observes if the changes have had any effects. This means that the researchers will acquire new knowledge about the situation, the process of change, and the results (Solheim & Stølen, 2007).

The iterative process of action research follows five phases:

1. Diagnose
2. Plan actions
3. Implement actions
4. Evaluate effect
5. Describe learning

Action research has been criticized for not producing enough basic research because the action researchers' work is often similar to consultancy. In order to be defined as research, the new knowledge that is created needs to be of interest to others, in addition to the organization studied, and the knowledge should be documented in a way that lets other researchers reproduce it (Solheim & Stølen, 2007).

Although action research seems very different from classical research and technology research, Solheim and Stølen (2007) found that the two approaches share similarities. Solheim and Stølen compared the five phases of action research to the three stages of classical research and technology research and found that the five phases can be placed in the same three phases as technology research; problem analysis, innovation, and evaluation.

Below is a table illustrating the similarities between action research and technology research.

	Technology research	**Action research**
Problem	Need for new artifact	Need for improved organization
Solution	New artifact	Action plan
Solution should be compared to ...	Relevant need	Relevant improvement need
Overall hypothesis	The new artifact satisfies the need	The action result in an improved organization satisfying the need

Table 3 Comparison of technology research and action research. (Solheim & Stølen, 2007, p. 16)

Both approaches start with a need. In technology research, there is a need for a new or improved artifact, whereas in action research there is a need for improvement in an organization. In technology research, the desired solution is a new artifact that satisfies the need, while in technology research the solution sought is an improved organization satisfying the need.

Research through design (RtD) starts with a problem and the goal is to produce new knowledge. This is done through the creation of artifacts, by using methods, practices, and processes from design practice. In RtD one seeks to document the process in a way that enables other researchers to follow the same process, although there is no expectation that researchers following the same process would produce the same or similar artifact. RtD generally rejects the idea that research is equivalent to science. Design research is instead considered separate from engineering or scientific research (Zimmerman & Forlizzi, 2014). "RtD draws on design's strength as a reflective practice of continually reinterpreting and reframing a problematic situation through a process of making and critiquing artifacts that function as proposed solutions" (Zimmerman & Forlizzi, 2014, p. 167).

The iterative process of RtD follows five stages (Zimmerman & Forlizzi, 2014, p. 184):

1. Select
2. Design
3. Evaluate
4. Reflect and disseminate
5. Repeat

The process starts with the selection of a research problem. The selection is an iterative process and continues until all the researchers involved agrees. The research team should also select which RtD practices to follow;

- Lab - a combination of design action and experimental evaluation
- Field - inspired by participatory design and user-centered design
- Showroom - critically challenging the status quo

The next stage is to design activities, by exploring new ideas for products, artifacts, or services. The team should evaluate the ideas. The team should also document and reflect on the design process, in addition to giving a rationale for what they have done. The produced artifact should be evaluated against the selected RtD practices and research question.

We have found similarities between action research and RtD. In both research approaches, there is a need that seeks to be fulfilled. In action research, the researchers work in the organization where they seek to implement changes for improvement, while in RtD the researchers work with the process of satisfying the research problem. The process leading to the solution is of importance for both approaches.

Below is a table illustrating the similarities between action research and research through design.

	Action Research	**Research through Design**
Problem	Need for improved organization	Need for new artifact
Solution	Action plan	New artifact
Solution should be compared to ...	Relevant improvement need	Practices and relevant need
Overall hypothesis	The action result in an improved organization satisfying the need	The design actions leading to a new artifact produces new knowledge

Table 4 Comparison of Action Research and Research through Design

Solheim and Stølen (2007) have found that classical research, technology research, and action research are closely related. We argue that RtD also shares similarities to the other three research approaches. All four approaches start with a need. While technology research and

RtD has a need for a new artifact and classical research has a need for a new theory, action research has a need for improving the processes or systems of an organization. Classical research, technology research, and action research are conducted through the three main iterative phases of problem analysis, innovation, and evaluation (Solheim & Stølen, 2007). We argue that RtD also follows the same phases.

The scientific approach we have chosen for our project is technology research. As researchers, we are not interested in making organizational changes within AB Food, although the service we make may disrupt the organization. We are not committed to making a general theory to describe the real world. This makes both classical and action research less suitable for our research. As RtD focuses more on the process, we find technology research suitable as a method for to reaching our objective in this research project. To us, technology's ability to satisfy a need is more important than understanding the processes that lead to the technology. To satisfy the need of increased understanding of customers' trust in online grocery shopping, we create prototypes.

Paradigm

Research paradigms affect the way researchers study and interpret knowledge (Mackenzie & Knipe, 2006). Within epistemology, one can generally differentiate between the following research paradigms; the critical, the interpretative, the positivist, the pragmatic, and subjectivist research paradigms. Myers (1997) presented the first three research paradigms: the critical, the interpretative, and the positivist research paradigm. The critical paradigm acknowledges that humans' ability to change is often constrained by political, social, or cultural dominance. These constraints are often historical and reproduced by society. Social critique is central to critical research and its focus is often on conflicts. The interpretative paradigm assumes that knowledge is accessed through social constructs and shared understanding and experiences, as language and consciousness. Interpretive research uses the assigned meanings of people to gain knowledge and understanding of what is researched. Positivist studies assume that the world can be measured and tests theories to gain an understanding of what is researched. The surroundings are assumed to be objectively unrelated to who conducts the research.

In addition to the three main paradigms Myers (1997) identified, Easterby-Smith, Thorpe, Jackson, and Lowe (2008) present pragmatism. Pragmatism combines elements from both the

positivist and the interpretive paradigms[6], where observation and reflection are balanced. Any meaning structure must come from lived experience, be reflected upon, conceptualized, and tested/experimented before it can be used as knowledge of the concrete experience.

Crotty (1998) presents subjectivism, wherein the subject imposes meaning on the object. Subjectivism is different from the interpretive paradigm in how this meaning is generated. In the interpretive paradigm[7] the understanding is based on the object and its context, in subjectivism, the understanding comes from somewhere else as dreams, unconsciousness, or religious beliefs.

Our research is placed within the pragmatic research paradigm and we use a design based research method with mixed methods. We wanted to use a combination of elements from the positivist and interpretive paradigms. This combination is found in the pragmatic research paradigm (Easterby-Smith et al., 2008). The different methods we will use generate a mix of quantitative and qualitative data and are typical for both the positivist and interpretive paradigms. The research question is central in the pragmatic paradigm, and researchers can use any method providing insight into the question (Mackenzie & Knipe, 2006). We, therefore, find this paradigm appropriate for our research. The design based research method means that the scientific approach we have used, technology research, is concerned with solving the research need through design.

3.2 Design approach

In the previous section, we described how the scientific approaches such as technology research start with a need for a new artifact with the goal of creating new or improved artifacts. We, therefore, need an approach for designing the new or improved artifact or service. Although technology research is concerned with artifacts, we believe it is also valid for the creation of services because the field of design is no longer only concerned with the design of products. In this section, we will give an overview of different design approaches and the changes in the design field, and introduce service design thinking, which we will use in this project.

[6] Author uses the word antipositivist instead of the interpretive paradigm
[7] Author uses the word constructivism instead of the interpretive paradigm

There are different approaches to designing computer systems. Saffer (2010) suggests four different design approaches to handling design projects: genius design, systems design, activity-centered design, and user-centered design (UCD).

In genius design, the designers are the source inspiration. They use their skill and wisdom of design to make products. Here, the users are the source of validation. Genius design is widely used, but best practiced by experienced designers. Systems design focuses on the components of a system. The users set the goals of the system and make sure that the parts of the system are designed accordingly. This type of design analyses how systems act with each other and emphasizes context. Systems design tries to remove guesswork and fuzziness by providing clear roadmaps. Systems can consist of people, devices, machines, and objects. The focus of activity-centered design is on the tasks and activities that need to be accomplished. The users conduct the activities and the designers create tools that support tasks required to carry out the activities. Activity-centered design has its roots in activity theory, which is a psychological framework and favors what people do. To get knowledge about what people do, their activities are observed and used for the design of the system. In UCD, the user guides the design and the designer translates the user's needs and goals. The approach focuses on user needs and goals. Users ideally participate in every design stage and are in some cases co-creators. Designers focus on the users' wants and needs and then determine what is needed to achieve these.

The design field started with the idea of design as a profession related to areas such as graphic design, product design, and fashion design. The field has then changed from being 'design centered design' into 'user centered design'. The field of design is no longer restricted to designing tangible products but is concerned with the design of complex and interactive experiences, systems, and processes. With these changes, the field of 'service design' has emerged (Trischler & Zehrer, 2012). Sanders and Stappers (2008) also studied the development and changes in the design field. They claim that the user-centered design approach, which began in the 1970s, does not address the challenges of today because we are no longer only designing products for users, we are designing experiences. As a result, new design disciplines have emerged.

3.2.1 Service design thinking

Service design systematically applies design methodology and principles to the design of a service. It has an outside-in perspective and is a user-centered approach (Bruce & Bessant, 2002; Holmlid & Evenson, 2006; Mager, 2004 in Holmlid, 2009a, p. 1). The visualization of experiences is claimed to be one of the main characteristics of service design. This means that service designers work visually, making the invisible (such as ideas and processes) visible, manageable, and comprehensible throughout the design process (Trischler & Zehrer, 2012). A service designer can:

> […] visualise, express and choreograph what other people can't see, envisage solutions that do not yet exist, observe and interpret needs and behaviours and transform them into possible service futures, and express and evaluate, in the language of experiences, the quality of design (Service Design Network, 2005, in Holmlid, 2009a, p. 2).

Therefore, service design can be described as a multidisciplinary field dealing with the functionality and complexity of services by visualizing their systems and processes, while also involving the client in the process. In this way, problems are identified and solved through the creation of solutions that benefit both the user and the service provider (Trischler & Zehrer, 2012)

Stickdorn and Schneider (2011) explains service design thinking as being an interdisciplinary approach that combines different methods and tools from various disciplines. They point out that service design does not have one single definition. "If you would ask ten people what service design is, you would end up with eleven different answers - at least" (Stickdorn & Schneider, 2011, p. 29). Instead, they describe service design as a mindset, which can be illustrated through five core principles described below.

User-centered

The first principle is the focus on including the users since the intention of a service is to meet the customer's needs. It is, therefore, important to gain insights into methods and tools that let the service designer slip into the customer's shoes (Stickdorn & Schneider, 2011).

Co-creative

Co-creation is about collaboration and inclusion of stakeholders in the process of designing services. Service designers facilitate an environment for generating and evaluating ideas in

multidisciplinary stakeholder groups. To obtain user insight and for the development, prototyping, and testing of service concepts, different methods and tools are used, as described by Stickdorn and Schneider (2011). This is what they define as co-creation and they highlight that facilitating co-creation in groups that represent the stakeholders is essential in service design thinking.

Blomkvist and Holmlid (2011b) state that the concept of co-creation can be contrasted to other approaches such as genius design or expert design where the process can be seen as a black box because it only makes the result of the process visible, and does not include or reveal the process to others. The trend is shifting towards an increment of designers, including non-designers in the process, and there has been an increased interest in cooperative design in the academic literature. The trend of co-creation and involvement of stakeholders is often said to be influenced by participatory design.

Sequencing

To explain sequencing, Stickdorn and Schneider (2011) state that one can imagine the service as a movie. If it is too slow, one might get bored, and if it is too fast, one might get stressed. This analogy is used to interpret service processes into touchpoints and interactions. The combination of touchpoints and interactions is called service moments. Stickdorn and Schneider further explain that every service process consists of the following three stages: a) pre-service period, which is when the user gets in touch with the service, b) the actual service period, which is when the customer experience the service, and c) the subsequent post-service period.

Evidencing

Services often take place in the background and are often designed to be discreet. This can create a disparity in customer expectation, which can lead to dissatisfaction with the service. This is where evidencing, which is about making the intangible tangible, come in. Evidence can explain certain aspects of a service touchpoint or process through a variety of ways such as bills, emails, signs, or brochures. In this way, evidencing adds a tangible component to the otherwise intangible experience (Stickdorn & Schneider, 2011).

Holistic

Stickdorn and Schneider (2011) state that working in a holistic way, considering all aspects of a service, is not possible. However, they point out that the intention should always be to look at the wider context of the service process. In this way, the service designers try to work holistically.

In this research project, we use service design thinking as our design approach. The reason we choose this approach is that we are concerned with the design of services and not artifacts or products. Service design thinking can be used for both the creation of new services and for the development of existing services. We want to answer our research question by creating a service, and we find it important to include stakeholders. By including stakeholders such as management, employees, future users, designers, and developers, we hope that our proposed services can benefit both future users and AB Food. The fact that both technology research and service design are iterative approaches makes it simpler to combine them. In addition, by being part of the CSI project, collaborating with SINTEF and AB Food, it is relevant to choose service design as our design approach. Service design provides insight into how customers use services. This insight is useful for reaching the objective of gaining an increased understanding of customers' trust in online grocery shopping.

3.2.2 Service design and innovation

As Polaine, Løvlie, and Reason (2013) point out, service and innovation are closely related. This means that service designers need to help clients move from an industrial mindset towards a service paradigm. Service designers use the same tools and methods whether they are engaged in the innovation of new services or improvement of existing services. What separates these two is the different purpose of insights.

When the service is innovative, the main concern is to ensure that the value proposition is viable, meaning that the service fulfills the customer's needs. Innovation work often requires thinking outside of the current norms, but it can risk becoming distant from people's needs and problems. Therefore, it is important to understand the underlying need of the innovative suggestions, by involving users. Innovation based on insights answer the following question; "Will our offering make sense in the context of people's lives, and will they find it valuable?" (Polaine et al., 2013, p. 41). When the service design project is about improving an existing service, the focus of research insight is different than if the project is to create a new service.

An existing service may already have customers or competitors, which leads to the assumption that users already understand the service and that it is of value. This means that instead of focusing on the unfulfilled needs, the concentration should be on the use context by looking at failure in the service and how to improve the experience. However, these two areas overlap. Improvement may happen through small innovation, or an innovation idea may be rolled back and instead, parts of it applied to an existing service or touchpoint as an improvement. What differs these two is the focus of the outcome of the insights research. (Polaine et al., 2013). The overlap between focusing on innovation and existing services is relevant for our study and will be discussed in chapter 6.

3.3 Data collection methods

The purpose of this chapter is to present different variations of the methods we will use in the work of this master thesis. Some of these methods are, according to Polaine and colleagues (2013), commonly used by people working with service design. However, as they point out: "Any methods that help you understand people's motivations and behaviors more deeply, including those methods you may already be using in interaction design or UX work, will contribute to a service design project." (p. 50). The data we will collect comes from multiple sources. Having multiple sources of data collection is termed data triangulation. It gives the researcher more comprehensive relevant information and helps in crosschecking their consistency in order to strengthen the validity of the findings (Wahyuni, 2012).

3.3.1 Interviews

Lazar, Feng, and Hochheiser (2010) view an interview as a conversation, which goes in depth on a subject of interest for the researcher. The conversation can have different types of questions such as closed or open-ended, asking for stories, completing sentences or asking for conceptual maps (Lazar et al., 2010). Different types of interviews will be presented below.

Open-ended or unstructured interviews are exploratory; the interview guide is often just a list of topics or loose questions related to the topic. Questions are open-ended and the answers are not expected to have a particular form. Unstructured interviews are often good to capture users' first impressions of design solutions and allow them to talk freely. The disadvantage is that the data often will be unstructured and time-consuming to analyze. One of the main benefits of interviews is the ability to "go deep". Data that would otherwise be hard to

capture, can be revealed through enabling the interviewees the freedom to give detailed responses (Lazar et al., 2010; Sharp, Rogers, & Preece, 2015).

Semi-structured interviews are often based on a predefined set of questions or a manuscript. The interview will then deviate from this to ask for clarifications, ask follow-up questions or shuffling questions by rearranging them to fit the conversation better (Lazar et al., 2010). It is important to not suggest that a particular answer is expected, in follow-up questions. Semi-structured interviews use both closed and open-ended questions, and probe questions such as "Do you want to tell about anything else?" (Sharp et al., 2015).

Structured interviews use a strict, predefined, manuscript with no room for deviation. The technique and questions asked are often similar to survey. The difference is that structured interviews often yield more extensive answers. It is common to ask closed yes/no questions or questions answered with alternatives or on scales. The data is often easy to analyze at the cost of not being able for ask follow-up questions or clarifications. (Lazar et al., 2010; Sharp et al., 2015).

Group interview is a technique where multiple interviewees are interviewed in a group. A popular type of group interview is called focus groups (Sharp et al., 2015). Focus groups are covered below.

3.3.2 Focus group

Focus group is a type of group interview with a group of up to ten interviewees. Group interviews use the same type of questions and can follow the same structures as an ordinary interview. The goal of the focus group is to facilitate a group discussion where the participants can draw on each other's experiences and different points of view. It is a good way to explore issues in a community setting (Sharp et al., 2015). "Focus group work is valuable to ethnographic and related qualitative research because it illustrates and explores the intersubjective dynamics of thought, speech, and understanding." (Crang & Cook, 2007, p. 91). For this reason, focus groups are most valuable when conducted in an unstructured or semi-structured fashion. Focus group follows a preset agenda but has flexibility. In this way, discussions can unfold and the researcher can follow up on interesting themes. It can be one moderator or multiple moderators may cooperate to ensure successful data collection (Lazar et al., 2010; Sharp et al., 2015).

A benefit of the focus group is that the group allows diverse or sensitive issues to be raised (Sharp et al., 2015). A disadvantage is that the cross talking between informants may lead to the participants affecting each other. In addition, there is a possibility to get biased answers because of sensitive or inappropriate themes (Iachello & Hong, 2007). The conversation also takes time, which might limit the number of questions asked and answered (Lazar et al., 2010).

3.3.3 Workshops

One type of workshop that is presented by Polaine and colleagues (2013) is the client workshop, which is the one we will conduct in this research project. In our project, we name the client workshop for stakeholder workshop, because the client is a part of the stakeholder group. The benefit of this workshop is that together with the clients one gets the opportunity to explore needs that can be used as inspiration for idea generation. In addition, involving clients early in the project could make it easier later when explaining the design solutions (Polaine et al., 2013).

Another type of workshop we will use is the future workshop, which is a commonly used technique in the Participatory Design tradition (Brandt, Binder, & Sanders, 2012). It consists of the following five phases; the preparation phase, the critique phase, the fantasy phase, the implementation phase and the follow-up phase (Vidal, 2005).

The following phases are central in the workshop;

- Critique phase - In this phase, the goal is to gain a critical understanding of the theme by mapping out all problems and issues in question. The participants will use brainstorming and write down their critics on post it's.
- Fantasy phase - In this phase the participants are encouraged to be utopian and imagine all possibilities in the future. The participants are told that there are no restrictions or barriers to their suggestions. The ideas from the brainstorming are written down on post it's.
- Implementation phase - In this phase, all of the ideas from the previous phase are evaluated in terms of how realistic the implementation is. The ideas can also be modified to make them more probable to implement. When this is done, the participants should choose the most promising idea for further development.

3.3.4 Observation

Observation can be conducted directly, with the investigators observing users directly while performing activities, or indirectly through records of the activities, which are studied afterward (Sharp et al., 2015). The method can be described as "deep hanging out" following three main stages presented by Crang and Cook (2007):

1. Gaining access to the particular community
2. Live or work with the people of study
3. Summary and writing up the study to make sense of the data

The researcher is observing when watching activities as if he or she is not present, but observation could also include recordings of field notes, photographs or drawings, etc. Another type of observation is shadowing, which involves following subjects around and observing activities of interest. Shadowing creates an understanding of how the subjects work and what they need. This method helps to get the full picture of how different activities are connected. Shadowing allows for asking questions and clarifications under or after the observation, depending on how involved the researcher is in the activities (Lazar et al., 2010). In service design, shadowing helps to create a holistic view of the service, offering an understanding of real-time interaction and the touchpoints involved (Stickdorn and Schneider, 2011).

Lazar et al. (2010) claim that it can be challenging to take appropriate notes from observations. In the beginning, it can be hard to decide what is interesting and what is not. After a while, when one starts to build an understanding, one might be able to understand matters of interest. Using schedules may focus and structure the observation and make the process easier (Sharp et al., 2015).

3.3.5 Think-aloud

Thinking aloud is regarded as one of the most common techniques in HCI (Janni Nielsen, Clemmensen, & Yssing, 2002, p. 101).

> Think aloud (TA) is widely used in usability studies to gain insight into how people work with a product or interface. The basic principle of TA is to ask users to work on typical tasks and to verbalize their task performance and thought process. (Ramey et al., 2006, p. 46).

Questions such as “What are you thinking now?” are raised (Jakob Nielsen, 1992), and therefore the think-aloud technique is regarded as useful for gaining a deeper understanding of what is going on in the user’s head (Sharp et al., 2015). The technique is often applied differently than the classical think aloud introduced by Ericsson and Simon (1984), meaning that researchers have modified or combined it with other techniques (Janni Nielsen et al., 2002). Because of the different ways of applying the technique, questions about its validity has been raised (Ramey et al., 2006).

Although Jakob Nielsen (1992) is positive to the technique he mentions that the main disadvantage of think-aloud is that the time used will not be representative of actual use, as the verbalizing of thoughts will make the user use more time.

3.3.6 Questionnaire

Questionnaires enable collection of demographic data and users’ opinions. They can be compared to interviews because they both can have the same type of questions, closed or open ended. However, one of the benefits of the questionnaire is that it can be distributed to a large number of participants, even those located far away because of the possibility of distributing them online. It also has the benefit of giving answers quickly and can help in creating an overview over “the big picture”. Questionnaires can be used on their own. A drawback is that they give less in depth answers compared to qualitative methods such as interviews or observations. Therefore, they are usually combined with other methods in order to get a deeper understanding of a matter (Lazar et al., 2010; Sharp et al., 2015). Compared to interviews, it can be harder to make good questions for the questionnaire because often there will be no interviewer present to answer, explain or clarify questions.

Questionnaires are often part of surveys (Dillman, 2000). The term survey refers to the comprehensive methodical approach and takes to account issues as sample size, stratification, and data validity. The term questionnaire more often refers to the artifactual list of questions and how they are developed. Questionnaires are distributed to people of interest, also called target population. Often it is not feasible to get a response from the entire population and a sample is used instead. The process of choosing participants from a population is called sampling. There are several sampling methods. These can be divided into two groups, probabilistic sampling, and non-probabilistic sampling. (Lazar et al., 2010).

A probability sample is a sample from a known population, where participants are randomly selected, and the probability of selection can be determined. This makes it possible to produce unbiased estimates of populations. Examples of probabilistic sampling methods are simple random sampling, stratified random sampling, and cluster random sampling (Trochim, 2006). A nonprobability sample is a sample where the probability of selection cannot be accurately determined, which makes it is difficult to know if the population is represented well. Because it can be impractical or unfeasible to do a random sampling, the assumptions or criteria for the sample allows researchers to not select participants randomly. There are two main types of non-probabilistic sampling: accidental or purposive. An example of accidental sampling is a convenience sample were the questionnaire is distributed to "the man in the street" or accessible for anyone online (Sharp et al., 2015; Trochim, 2006). A purposive sample acknowledges opportunities and builds variety (Stake, 2005). In purposive sampling, there is a purpose behind the selection and a greater potential for learning. Purposive sampling is useful for getting opinions or responds from the target population quickly. Non-probabilistic methods are often used in HCI, as the population is hard to define and population estimates are not a goal (Lazar et al., 2010; Trochim, 2006).

3.4 Techniques of service design thinking

Segelström and Holmlid (2009) have done a study where he found that service designers use visualization techniques to interpret the collected data, which can help understanding both the problems and possible solutions. The study shows that visualizations are used in two ways in the interpret-research phase; "[...] visualizations are either used as tools for translating raw data into insights (such as conceptual mapping) or as a way of communicating insights (such as customer journeys)." (Segelström & Holmlid, 2009, p. 6). In this way, the visualization techniques are used for more than just mapping and describing, because it provides the designer with tools for interpretation and understanding.

This section describes the techniques we plan to use in the project. Some techniques will be used after data has been gathered from meetings with AB Food, such as the stakeholder map. Other techniques, such as the customer journey map, will be used for idea generation and visualization during the conduction of workshops. Some techniques, such as the customer journey map, will also be used when conducting focus groups, to give the participants a better understanding of the presented solutions.

Customer journey map

A customer journey map provides an overview of all activities related to a service. All interactions between the user and the service are the "touchpoints" that together form a journey based on the user's experience. It can be used to understand how users behave and feel throughout a journey. The customer journey map is one of the most common visualization techniques (Stickdorn & Schneider, 2011; Zomerdijk & Voss, 2010).

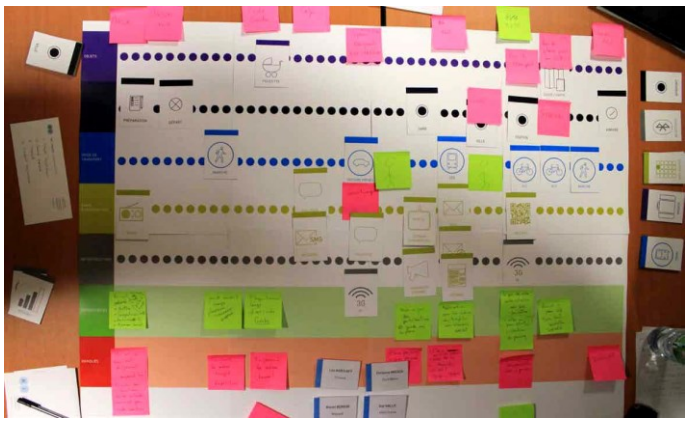

Figure 2 Example of a Customer Journey Map. (Kahn & Tallec, 2009)

Stakeholder map

The different groups that are involved in a service can be visualized through a stakeholder map. The stakeholder map gives an overview of all the stakeholders such as the employees, customers, partner organizations and others, and the interplay between these groups can be mapped and used for analysis. (Stickdorn & Schneider, 2011).

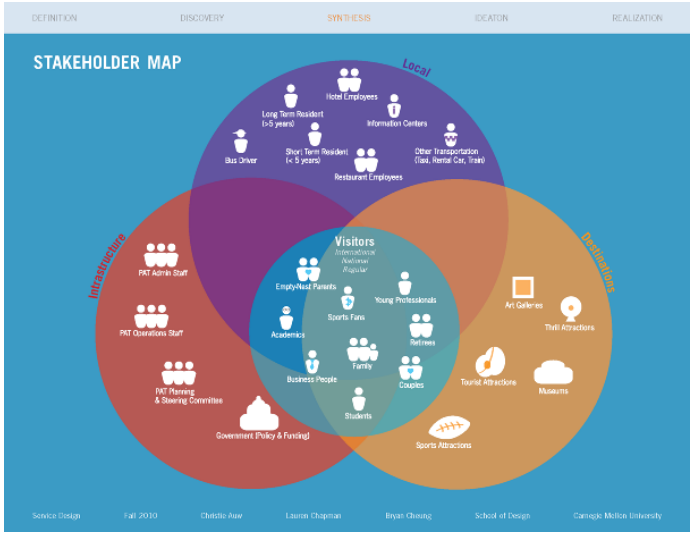

Figure 3 Example of a stakeholder map. (Auw, Chapman, & Cheung, n.d)

Prototyping

Blomkvist and Segelström (2014) explain that much research has been done indicating that creating representations of services is central in service design. The two main types of external representations that have been identified within service design are visualizations and prototypes. Blomkvist and Segelström (2014) describe visualizations of services as "[...] depictions of current and/or future states of the service. [...] visualizations are primarily used as summarizations of research on a current service or as the deliverable of a project, showing how the new service is suggested to be structured." (p. 335) Prototypes are described as being used for prototyping, with the intention of improving the suggested ideas and solutions. This is an iterative process where ideas and solutions are tested and refined (Blomkvist and Segelström, 2014).

It is important to be aware of the purpose of prototyping. According to Houde and Hill (1997, in Blomkvist & Holmlid, 2011a, p. 4) designers need to be aware of what they are actually prototyping. Three of the main purposes of prototyping are; exploring, evaluating, and communicating (Buchenau and Fulton Suri, 2000; Schneider, 1996; Smith and Dunckley, 2002; Voss and Zomerdijk, 2007 in Blomkvist and Holmlid, 2011a, p. 4). Prototypes with the purpose of exploring may be ideas about concepts that the designer want to test. Furthermore, they are typically used in early phases for rapid-prototyping. These prototypes must be designed in a way that enables feedback and new knowledge or information (Blomkvist and Holmlid, 2011a).

3.5 Data analysis

Data analysis involves making conclusions and reasonings based on the collected raw data (Patton, 2002, in Wahyuni, 2012, p. 75). Data analysis can be done in several different ways. The chosen method often depends on the type of data collected; qualitative or quantitative. It also depends on how much time is available and how accurate or detailed results one wants. It is important to think of the data analysis early, as it may influence the choices when doing the data collection (Lazar et al., 2010).

Data analysis is a creative, active, making process. It starts during the data collection, in the way the notes are taken and structured. The researcher gets a first impression of what is important, which details to add, and what to leave out. Data analysis is also influenced by the choice of collection method and analysis technique. Analysis can be carried out with a

varying degree of structure, as the qualitative data can more or less structured (Crang & Cook, 2007). The more structured the data the easier the analysis (Lazar et al., 2010).

There is two main categories of analysis, qualitative and quantitative analysis. There are many techniques that are fit to analyze qualitative data e.g. critical-incident analysis (Lazar et al., 2010, p. 211), affinity diagrams (Sharp et al., 2015, p. 292), content analysis or discourse analysis (Lazar et al., 2010, p. 208). There are also less strict and more simplified techniques, which require less time and are more suited to answer simpler questions. Here we present some of the relevant data analysis techniques for our research; thematic data analysis, descriptive statistical analysis, and organization of data. In the end of this section, we discuss validity and reliability.

3.5.1 Thematic data analysis

Sharp et al. (2015) describe simple qualitative analysis, consisting of identification of recurring patterns and themes, and categorization of data. When identifying recurring patterns and themes, the researcher groups similar data and findings. The themes are chosen based on the study's goals and research question.

Braun and Clarke (2006) argue that thematic data analysis is a core method for analyzing qualitative data. Thematic data analysis is flexible for analyzing different types of data and is suited for both a positivist and an interpretive paradigm[8]. It can give a detailed and complex account of the data analyzed (Braun & Clarke, 2006).

There are two primary approaches to thematic analysis, inductive or 'bottom up' and deductive or 'top down'. The inductive approach is data driven and has similarities to grounded theory where the data is not placed in predefined themes. Rather the theme of the research is defined by the data. The deductive approach is driven by the research questions and themes are often predefined and less detailed. This approach is more analyst driven. In addition to using different approaches, the analysis can be carried out on different levels; a semantic or explicit level, or a latent or interpretative level. "[...] semantic approach would seek to describe the surface […], form and meaning, while the latent approach would seek to

8 Braun and Clarke use the terms essentialist and constructionist paradigms. To be consistent we use the term positivist for essentialist and interpretive for constructivist.

identify the features that gave it that particular form and meaning.“ (Braun & Clarke, 2006, p. 84). On the semantic level, the explicit meanings of the data are summarized and theory is applied to produce patterns of significance. On the latent level underlying ideas, assumptions and conceptualization are discovered, by going beyond the semantic content of the data. The combination of a positivist view and analysis on a semantic level is common, while interpretive studies often use a latent level, but it is no rule (Braun & Clarke, 2006).

3.5.2 Descriptive statistical analysis

To uncover patterns in data it is useful to display the data, giving an effective presentation of the results (Nick, 2007). Descriptive statistics helps to present a simple summary of basic features of the study and the data. It is a powerful tool that enables comparisons across units of data. Descriptive statistics forms the basis of most quantitative analysis of data (Trochim, 2006).

When analyzing one looks at the two main categories of variables, qualitative and quantitative variables. Qualitative variables, also called categorical variables, uses categories such as membership in one of a few groups. Quantitative variables are also called metric variables, measures amounts or quantities. Often when presenting descriptive statistics, variables, counts or frequencies of individuals in each category are often displayed (Nick, 2007).

3.5.3 Organizing data

Even before the analysis starts, data has partially been structured and given meaning through the notes and methods used. Before the actual analysis begins, it is important to make sure the data is stored in such a way that it is easy to find in form of naming images, using document titles, pagination and line numbering. It is vital that quotations are marked and that the material is placed in the correct order. After this is done, it is important to back up the organized and untreated data in case error analysis should result in some original material is lost. (Crang & Cook, 2007).

3.6 Validity and reliability

There are four types of validity presented by Shadish, Cook, and Campbell (2002). The first, conclusion validity is concerned with the relationship between the independent and dependent variables and refers to the degree to which conclusions made regarding the relationship are reasonable. The second type is internal validity, which builds on conclusion validity and asks, assuming there is a relationship between the independent and dependent variables, is the relationship a casual one? (Shadish et al., 2002; Trochim, 2006). The third type, construct validity is defined as, "the validity of inferences about the higher order constructs that represent sampling particulars" (Shadish et al., 2002, p. 38). Construct validity is related to generalizability. It is concerned with whether the independent, or treatment variable, was operationalized well. It is also concerned with whether the dependent, or outcome variable, which was observed, is in accordance with what intended. External validity is the fourth type and is related to generalizing the causal relationship. The question external validity answers is, would the conclusions hold for other persons in other places and at other times? External validity answers the question by demonstrating an adequate sample through a sampling model or a proximal similarity model. The sampling model describes how representative the sample is for the population, while the proximal similarity model describes relative similarities of contexts such as people, times and places (Shadish et al., 2002; Trochim, 2006). Marshall and Rossman (2006) links these four types of validity to the positivist paradigm.

There has been raised questions about the 'evidence' and quality of qualitative data. Measures such as validity, generalizability, and reliability have sometimes been seen as irrelevant to qualitative research. "From this perspective, the concept of evidence itself is problematic, suggesting as it does a neutral body of data which speaks the objective truth." (Mason, 2002, p. 38). Instead, Mason (2002) thinks the concept of evidence is problematic only if we try to apply it directly to qualitative research. She uses validity as an example and claims that research is valid if the researcher is observing, identifying or 'measuring' what he or she says to be doing. Validity is often associated with quantitative research, but the researcher still has to show that the results can be identified, observed or 'measured' in the same way as he or she say they can. Mason elaborates on the concepts of generalizability and reliability. Generalizability is achieved when the researcher can make a general claim based on the research or analysis. One of the ways in which generalizability can be done in qualitative research is by making arguments. This means that the arguments should be made

in a convincing way, e.g. by arguing evidentially, interpretively or reflexively. Researchers arguing evidentially are concerned with showing that their data have been conveyed and assembled in a thorough way. When arguing interpretively, researchers seek to demonstrate that their interpretations are meaningful and valid. Arguing reflexively means that the researchers are concerned with demonstrating the different interpretations of the data while opening for critiquing or questioning about them (Mason, 2002).

To ensure validity it is important to ground the interpretations in the data. It is also important to make strong arguments of the interpretations. To make this process easier, it is recommended to make a well-organized database of all collected material such as transcripts, notes, and images. The database can support the conclusions by making a chain of evidence, linking the analytical results to the raw data (Yin, 2003). It is necessary to document both data and procedures to ensure validity. However, this is not sufficient for establishing validity. There is also a need for multiple pieces of evidence. Data source triangulation, the use of multiple data sources, can provide this (Lazar et al., 2010).

Reliability is described by Morse, Barrett, Mayan, Olson, and Spiers (2002, p. 39) as: "[...] the accuracy of your research methods and techniques. How reliably and accurately do they produce data?" To verify validity and reliability of the study, quantitative researchers often use standards and criteria for evaluating research. However, qualitative researchers question the value and feasibility of standardization. Standards and criteria are applied at the end of the study. By directing the research as it is conducted, standards and criteria can not prevent faults that could reduce reliability or validity. In qualitative research, verification can be used to check or confirm the validity and reliability of the study. Verification strategies such as *methodological coherence, sampling sufficiency, the relationship between data collection* and *analysis or theoretic thinking* can be used to ensure reliability and validity of the data. Methodological coherence means to make sure there is a connection between the research question and the methods used. This process is often not linear. Sampling sufficiency is having a sample of participants that can represent or have knowledge of the research topic. The relationship between the collected data and the analysis is iterative and essential for obtaining reliability and validity. Theoretic thinking involves constant checking and rechecking of the collected data to build a solid foundation. Both organized databases and thorough verification strategies increase reliability (Lazar et al., 2010; Morse et al., 2002). Lazar and colleagues state that subjectivity is unavoidable when analyzing data, but advises

to keep an open mind and attend to every data point with the same weight, to avoid favouring those supporting the current theory.

3.7 Ethical considerations

There are several legal and ethical considerations to consider when conducting research. We will briefly go through some of the most important for our project.

3.7.1 Legal

In Norway, one must follow the personally identifiable information law [9], when working with personally identifiable information (PII) electronically. PII refers to information and assessments that make it possible to identify an individual (Personopplysningsloven, 2000). Examples of PII are name, address, phone number, email address, IP address, car registration number, photographs, fingerprints, iris pattern and identity number (Datatilsynet, 2012). Different regulations apply depending on whether sensitive or non-sensitive PII is gathered. Sensitive PII include racial or ethnic origin, political, philosophical or religious beliefs, suspicion or conviction for crime, health conditions, sexual relationships, and union membership (Personopplysningsloven, 2000).

Participant consent is required when conducting research in Norway. First, participants must be informed about the research project, such as the purpose of the data gathering, who has access to the data, how and for how long data is going to be stored. Participants should also get information on how to contact the researcher. It should be made clear that participation is voluntarily and that it is possible to withdraw from the project at any time without risking negative consequences. It is recommended to include information about what methods are used, what data are collected, whether these have implications for participants, and whether data are kept confidential and anonymous. Consent must be stated in a clear manner and must be voluntarily given (NSD - Norsk senter for forskningsdata, n.d).

[9] Translation of the Norwegian name Personopplysningsloven

3.7.2 Ethics

When doing research on people, it is important that participants are informed and that they understand what their participation is used for. This is not only due to legislation protecting research participants' rights, but it is also morally and ethically important. Without information, participants cannot make a meaningful choice regarding their participation. The choice of participation should be given voluntarily and without fear of vengeance or consequences (Lazar et al., 2010). Therefore, it is common to provide participants with information and get their written consent using a consent form. Consent forms often follow local standards and legislation, for example, from the Norwegian Centre for Research Data (NSD - Norsk senter for forskningsdata, n.d).

When conducting qualitative research it is important to be aware of the complex ethical issues that may follow. To do this, researchers must show openness, appreciation, and commitment to ethical principles for research (Marshall & Rossman, 2006). When conducting responsible research, researchers are obligated to protect the rights, health, and safety of participants. When doing HCI-research, fatigue is the most relevant risk factor, but physical and psychical harm should also be considered so that participants can be treated according to the risks (Lazar et al., 2010). For example, if researcher deceives participants, the researchers should first demonstrate that this will not be harmful to the participants (Marshall & Rossman, 2006).

If research requires people to change their routine or to spend time, it is important that participants do so voluntarily (Marshall & Rossman, 2006). Compensation for time and effort should be considered, and one should try to make the experience enjoyable and convenient for participants. Researchers should ensure that participants are not intimidated by language, presence, technical skill, or other factors (Lazar et al., 2010).

Robertson and Wagner (2012) discussed individuals' rights to influence their everyday life. Systems have an increasing influence on people's everyday, and poorly made software may influence people in a negative way. Therefore, user participation and representation is a positive force to avoid bad influences on people's lives.

4. Design process

In chapter 3, we described how technology research starts with a need that researchers aim to satisfy. The need we are investigating is the increased understanding of customers' trust in online grocery shopping. We focus on how to increase the perceptions of the ability of the person collecting groceries. While chapter 3 gives an overview of scientific approaches, design approaches, and data collection methods, this chapter gives an overview of our design process throughout the project. We start by giving a general presentation of the iterative process of service design, and then we describe the different studies conducted in the first phases of our design process.

4.1 The design process

Service design thinking is an iterative process, which means that it is a nonlinear design process. It is possible to define a structure, but this structure needs to be understood as an iterative approach. This means that at every stage of the service design process, it is possible to go back or start from scratch again, and it is important to ensure learning outcomes from previous iterations (Stickdorn & Schneider, 2011).

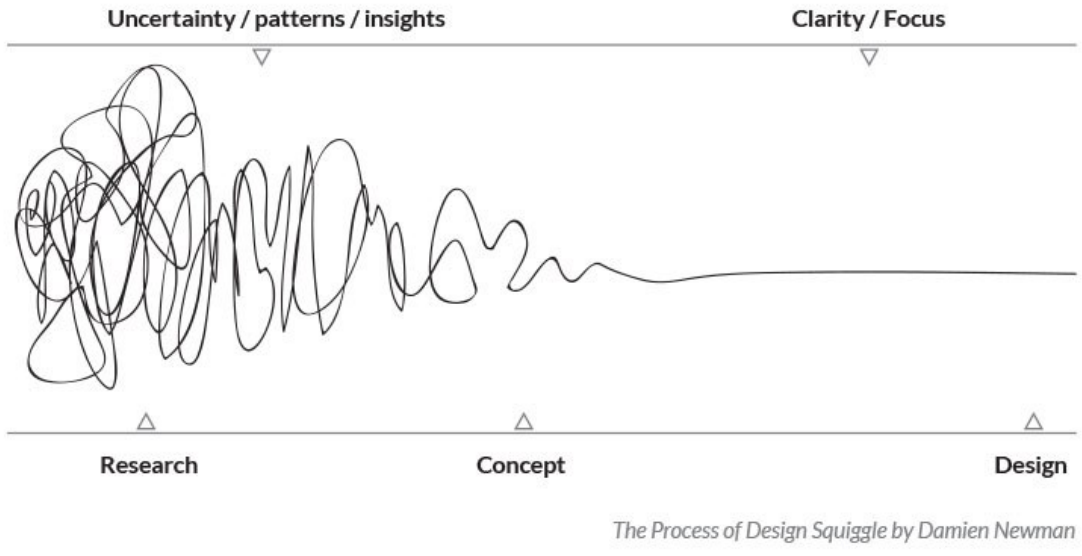

Figure 4 The process of Design Squiggle by Newman (2010)

Stickdorn and Schneider (2011, pp. 123-124) use "The Squiggle" by Newman (2010), figure 4, to explain that design processes are non-linear. We believe this is similar to what Sanders and Stappers (2008) present as the "fuzzy front end." Fuzzy front end describes the early

design stages, also called pre-design. It contains the early activities that explore the open-ended “how” and “what” questions trying to inform and inspire the design. In this early stage, it is often unknown what will be made, it could be a product, an interface, or a service. This stage often seems chaotic and ambiguous. After the exploration and negotiation of the fuzzy front, the ideas are developed first into concepts and prototypes, in the more traditional design process that follows.

To structure the complex design process, Stickdorn and Schneider (2011) use the following four iterative stages; exploration, creation, reflection and implementation.

Exploration

The exploration stage starts by identifying and understanding the problem that the service designer should work on, the first task. This is often viewed from the perspective of the organization. Stickdorn and Schneider (2011) further explain that the second task is to gain a clear understanding of the situation from the perspective of the customers. This is crucial for the success of service design. It is important to keep the bigger picture in mind and delay finding immediate solutions. The third task is to visualize the findings (Stickdorn & Schneider, 2011).

Creation

The creation phase is about exploring as many possibilities and mistakes as possible. It is important to test and retest ideas and concepts. Together with the reflection phase, creation is the stage where most iterations take place. The goal is to find solutions for problems that are discovered in the exploration phase. It is recommended to work in interdisciplinary teams to create holistic solutions (Stickdorn & Schneider, 2011).

Reflection

The reflection phase is about testing ideas and concepts from the previous creation stage. When testing, it is important that the customers get a good mental picture of the future concept. This can be done by using staging or roleplay inspired from theater. In this way, service situations can be played out (Stickdorn & Schneider, 2011).

Implementation

Implementing a new service requires a process of change. The change should be based on the creation and testing of the new concept from the earlier stages. To implement the changes, management needs to accept the new concept. Therefore, it is important to involve employees from start. After implementation, the change should be evaluated by doing a new iteration of the exploration phase (Stickdorn & Schneider, 2011).

Throughout this project, we have been through the three phases of explore, create, and reflect. We have not included the implementation phase because of time limitations and the focus we had on doing several iterations of exploring, creating, and reflecting upon new concepts before making decisions. Another way of structuring the design process has been described by the British Design Council (2007) as the double diamond, characterized by "Discover, Define, Develop and Deliver". The first quarter of the double diamond is the discover phase. The goal of this phase is to encourage team members to be divergent, meaning that they should have an open mind to identify problems and gather several ideas. The second quarter of the double diamond is the define phase. Here, the ideas identified in the discover phase are reviewed and selected or discarded. The goal is to obtain a clear definition of the problems identified and a plan for how the problems should be solved. The third quarter of the model is the develop phase. Here the goal is to make a product or service that is ready for implementation. This is done through working with a multidisciplinary team and using creative methods and techniques, such as brainstorming, visualization, prototyping, and testing. The fourth and last quarter of the double diamond is the delivery phase. In this phase, the product or service goes through final testing, production, and launching. The goal is to solve the problem identified in the discover stage. The delivery phase should also provide contributions to future projects by revealing lessons learned from the design process (British Design Council, 2007).

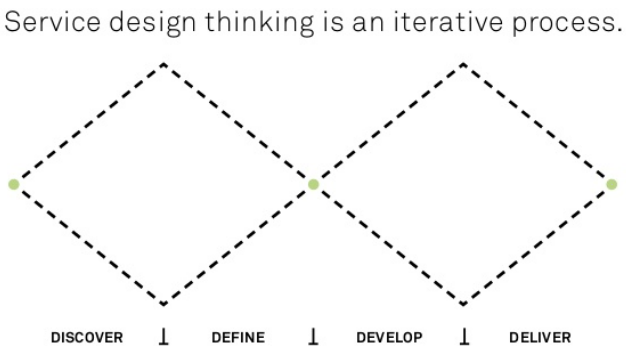

Figure 5 The Double Diamond.(British Design Council, 2007) Source: Stickdorn and Schneider (2011, p. 127)

There are several other ways of structuring this iterative design process, and the number of stages varies from three to seven. There are also different names used to describe the process of stages, such as identify-build-measure (Stickdorn & Schneider, 2011). We find the four phases of the double diamond (British Design Council, 2007), figure 5, to be similar to the four stages described by Stickdorn and Schneider (2011). Both of them describe the design process as being iterative. The exploration phase can be compared to the discover phase, the creation phase is similar to define and develop, reflection is similar to develop and deliver, while implementation can be compared to deliver. We argue that the iterative process of technology research also shares the similarities to the iterative processes of service design or as presented in the double diamond. We find technology research's phases of problem analysis, innovation, and evaluation, to be similar to the phases of exploration, creation, and reflection in service design, or discover, define, and develop in the double diamond. As Stickdorn and Schneider (2011, p. 126) state, the different structuring of the design process generally shares the same way of thinking.

4.2 Our design process

The design process presented below shows that our process has been iterative. It also shows the process of creating prototypes and how these have been evaluated with users.

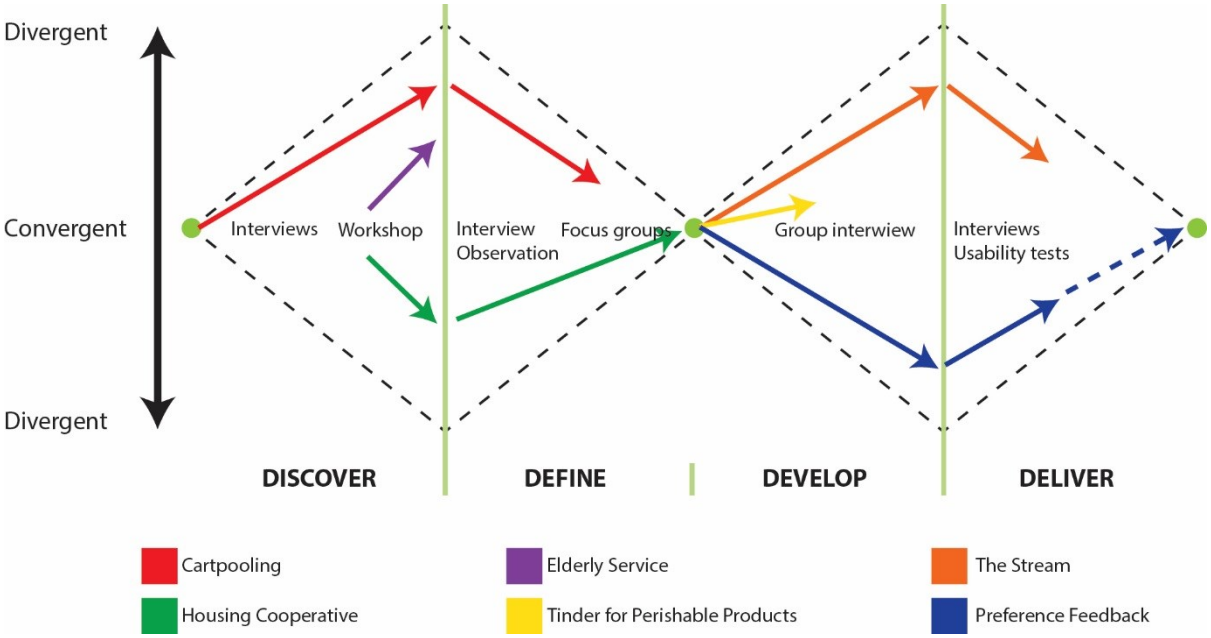

Figure 6 Our activities placed in the double diamond

In the double diamond above, we have placed our own activities throughout the project, in addition to the ideas that have been generated. In chapter four, we started conducting interviews with customers, with the goal of receiving feedback on our initial concept of *Cartpooling*, which sought to help neighbours shop groceries for each other. Then we conducted a workshop with stakeholders where ideas for two new online grocery services, *Housing Cooperative* and *Elderly Service*, were generated. While performing these activities we were in the discover phase, trying to be divergent. When observing employees, interviewing the board leader, conducting focus groups, and administering user questionnaires, we moved into the define phase. Here, we tried to get a clear understanding of the identified problems and how to solve them. In chapter 5, we move into the develop phase, developing prototypes. In the group interview with stakeholders, we aim to receive feedback on the three prototypes *Tinder for Perishable Products*, the *Stream*, and *Preference Feedback*. We conduct usability tests with customers, wherein we evaluate the usability of the *Stream* and *Preference Feedback*. We also evaluate customers' perceptions of trust in the services.

The diagram can be read as a timeline from left to right. The shape of the diamond illustrates the extent to which we have tried to be divergent when developing and testing ideas. The different coloured arrows show the various ideas that have been generated and tested. The arrows also give an overview of the phase in which the ideas were formed and rejected.

Prototype/Concept	**Study**	**Double Diamond Stage**
Cartpooling	User interviews	Discover
Cartpooling	Stakeholder workshop	Discover
Cartpooling and Housing Cooperative	Employee observations	Define
Housing Cooperative	Board leader interview	Define
Cartpooling and Housing Cooperative	User focus groups	Define
Cartpooling and Housing Cooperative	Questionnaire	Define
The *Stream, Tinder for Perishable Products*, and *Preference Feedback*	Stakeholder group interview	Develop

The *Stream, Preference Feedback*	Usability test with customers	Develop

Table 5 Overview of the prototypes/concepts developed in discover, define and develop phases

In the following sections, we will present the current online grocery store and the new proposed service, followed by the different methods we have used during the discover and define phases, including the creation and evaluation of the different ideas. In chapter 5, we will describe our studies conducted in the develop and define phases.

4.2.1 Current online grocery store and new proposed service

Current online grocery store

When we started our data collection, AB Food had recently launched the beta version of its online grocery store, with which customers can buy groceries online.

Before customers can use the service, they have to create an online user account by using their AB Food bonus program ID. When the user accounts are created, customers can log into the online store and start ordering groceries. Customers find the groceries through an online search, browsing categories, picking readymade recipes/bundles, and by looking at popular products or offers. When customers have selected the groceries they want, they proceed to the check-out, where the groceries are confirmed. If the store is out of stock, customers are asked whether they want a similar item, an item they have bought before, or no replacement. Customers can give general comments on their preferences. Then customers choose to pick up the groceries in store or at a pick-up point or to get the groceries delivered at home. Customers then choose the time of delivery, pay, and get the groceries delivered.

New proposed service: Cartpooling

Cartpooling was the first service we started with. We were presented with the service by AB Food, who had generated the idea together with their partners. They wanted us to explore whether the service was viable. With our research question in mind, we further elaborated the proposed service to find out if it could increase the trustor's perception of the ability of the trustee collecting the groceries for online orders.

Cartpooling is an online-based crowdsourcing service that connects neighbours in a network, with the purpose of grocery shopping for each other. Below is a visualization of the touchpoints that make up the service.

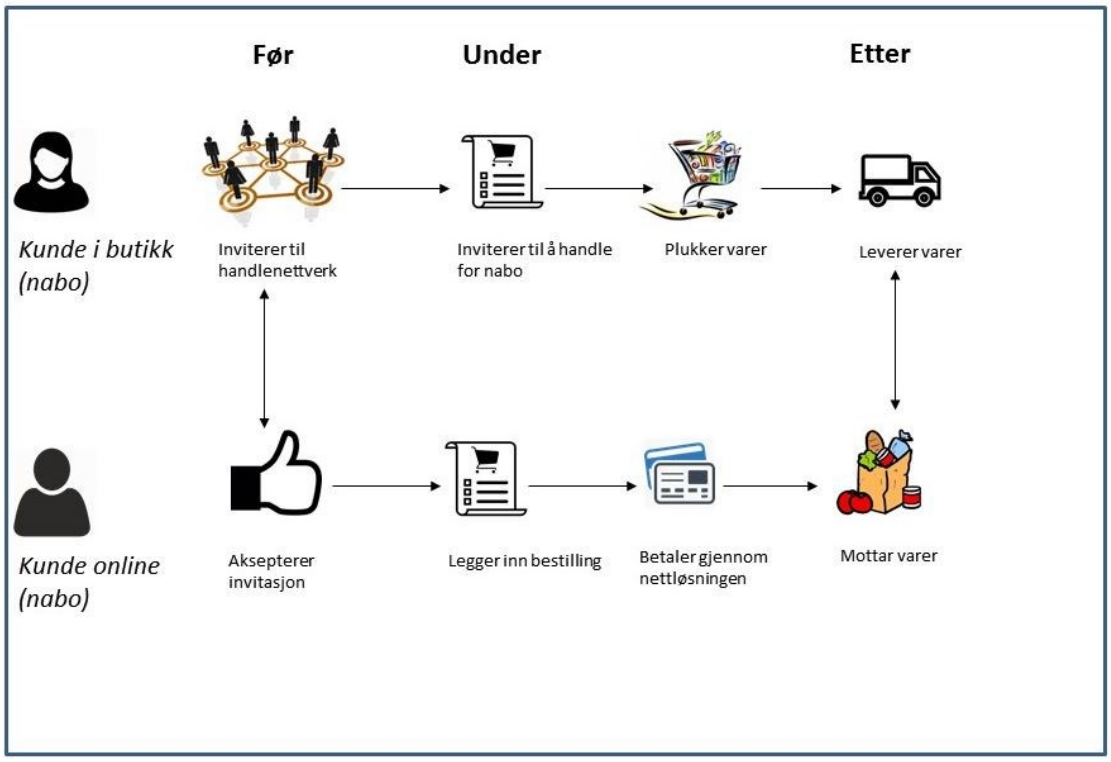

Figure 7 Customer journey map of the Cartpooling service

The customer journey map, figure 7, [10] presents two actors who are neighbours: the customer online and the customer in the store. The customer online orders and pays for the groceries in advance through an existing online grocery store. The customer in the store selects the groceries in the physical store and delivers them home to his or her neighbour. The neighbour receiving the groceries has the possibility to give feedback regarding the neighbour who delivered the groceries. The feedback is given in the form of a rating, and the purpose is that the neighbour delivering groceries can improve the job for future deliveries. The idea of using feedback in the form of rating was inspired by related services such as Vigo and GodtLevert, which use rating for customer evaluation of their services.

Stakeholder map

In the initial meeting with AB Food, we wanted to get an overview of the groups of users in the proposed service *Cartpooling*. Based on discussions with AB Food, we identified which

[10] The descriptions of the customer journey maps are in Norwegian because the workshops were conducted in Norwegian.

users represented the service. After the meeting, we made a stakeholder map, which visualizes the different stakeholders.

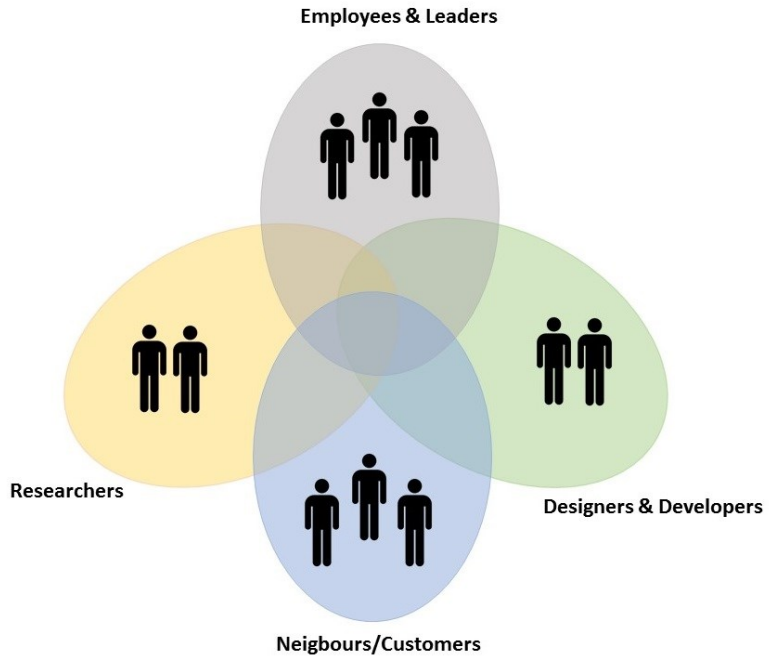

Figure 8 Stakeholder map of the Cartpooling service

Figure 8 shows the different user groups involved in the *Cartpooling* service. The stakeholders include neighbours, employees and leaders of AB Food, designers and developers, and researchers.

4.3 Methods and tools used in the discover and define phases

"Service designers use visualization techniques extensively in the stage of interpreting user research, and thus visualizations become early models of understanding both the problem space and the solution space" (Segelström & Holmlid, 2009, p. 7).

Service design is an interdisciplinary approach that combines different methods and tools from various disciplines (Stickdorn & Schneider, 2011, p. 29). In this section, we present the different methods and tools we have used throughout the discover and define phases of the design process. More precisely, we will describe how the study has been planned and conducted, and then presents the results, within each method. This is followed by an overall

description of how the data gathered from the different studies have been analyzed. Finally, we present the main findings.

Below is an overview of the studies we have conducted in the discover and define phases of the double diamond. The studies are related to the concepts *Cartpooling*, which was our starting point, and *Housing Cooperative*, which was generated in the workshop with stakeholders.

Prototype	**Study**	**Object of the study**	**In section**
Cartpooling	Interviews with five customers	Explore the topics of trust and motivation. Investigate interest, challenges, and possibilities with the new proposed *Cartpooling* service	4.3.1
	Workshop with 8 stakeholders consisting of executive and non-executive employees, developers, designers, and researchers. We acted as facilitators	Explore issues discovered in interviews with users	4.3.2
Housing Cooperative	Observation of one employee	Gain insight into the process of how employees handle online orders from customers	4.3.3
	Interview with one board leader of a housing cooperative	Find out if the *Housing Cooperative* service seemed feasible from a board member's point of view	4.3.4
Housing Cooperative and *Cartpooling*	Focus groups with 11 users. The users were co-students, friends, and family	Present the *Housing Cooperative* service to explore whether a dedicated person serving the same	4.3.5

		customers could be a solution to the issue of receiving perishable products that do not meet the customer's preference. Compare *Cartpooling* with *Housing Cooperative*	
	Questionnaire with 11 users. The same users as in the focus group	Generate quantitative data to help make a decision on which service to proceed with when comparing *Cartpooling* and *Housing Cooperative*	4.3.6

Table 6 Overview of studies conducted in the discover and define phases of the design process

4.3.1 Interviews

Background

The goal of the interviews was to explore the topics of trust and motivation, to look at customers' experience with online grocery shopping, and to gauge interest in, challenges with, and possibilities surrounding the new proposed crowdsourcing service named *Cartpooling*. We wanted to use interviews as a foundation for an upcoming workshop about the new service. We wanted to present the initial concept to potential customers to discover advantages and disadvantages with the service, to find out how easy the concept was to understand, get experience in communicating it and find recurring questions and confusion. Since we were interested in the customers' elaborated point of view, but also had concrete questions and less time for analysis, we chose to use semi-structured interviews as described in chapter 3.3.1.

Planning and execution

AB Food helped us with recruiting participants. We were introduced to five of its customers who were pilot testers for its new online grocery store. AB Food invited customers to interviews at their offices in Oslo. In this way, we did not have to consider the challenges with getting access to participants, scheduling interviews and securing facilities mentioned in Crang and Cook (2007).

We made a short interview guide (appendix A) with a description of how to conduct the interview, including a presentation of the project, the ethics guidelines, a consent form, and questions. We started with some closed questions as "warm up questions" to make the participants more comfortable. After these, we tried to make the questions open-ended to allow for the participants' opinions. At the end of the interview, we evaluated the interview to learn and to make improvements. We used this process in accordance with Crang & Cook's (2007) advice on how to "combat the interviewee's nerves". Many of the prepared interview questions were related to the research question. Questions such as "Do you feel safe? [when shopping groceries]" and "What issues do you see?" were made. We conducted a pilot interview to make sure the questions asked were clear, the order was logical, and that the time estimate was right. We also took care of practical issues such as creating and printing consent forms, getting audio recording equipment, printing sketches, and giving participants practical information and a small reward for their participation in the form of a gift card. The gift card was provided by AB Food, which usually provides gift cards to its customers who participate in interviews.

The interviews were held in a meeting room at AB Food's offices in Oslo. Because AB Food recruited the participants, it was natural to have the interviews there. The interviews started with an introduction of the topic and purpose of the study, and practicalities such as information and signing the consent forms. Following the introduction, we asked participants questions concerning three different themes:

- *Background information*; to identify participants' living situation and their relationships to their neighbours.
- *Online grocery shopping*; to identify the participants' experiences with online grocery shopping, their perceptions of the proposed new service *Cartpooling,* and whether they would be willing to shop for their neighbours or let their neighbours shop for them.
- *Trust and motivation;* identify participants' attitudes towards volunteer work, their motivations for helping others, what motivates them to help shopping for their neighbours, and their perceptions of rating persons who deliver their groceries.

Several interviewers participated in the interviews. At the first interview, there were four interviewers: one researcher from SINTEF, our contact person from AB Food, and us. We

were conscious of the issue that having many interviewers could be overwhelming to the participants so we tried to distribute ourselves in the room to make ourselves less threatening. We believe we succeeded as the conversations flowed well between the interviewers and the interviewees. After the first interview, we made some changes: the order of some of the questions was changed, as it felt more natural to ask about the crowdsourcing service, *Cartpooling*, before the questions about the interviewee's neighbourhood. In addition, we changed the introduction and made it more direct and customer-friendly. We also decided to explain the new service in a different way to make it more understandable.

In total, we interviewed five participants aged 44-67, three men and two women, in different life situations. Some of the participants were single; some lived in households with small children, and some with teenagers.

Results

In general, the participants had mostly positive feedback on shopping groceries online. Some suggestions on how to improve the process of buying groceries were made, mainly concerning issues with the environment and usability. The suggestions gave us ideas for how the online grocery store could be improved.

After explaining and asking about the new concept, *Cartpooling*, we noticed that all the participants were negative to it. As the service we solicited feedback for was not thoroughly described, we were uncertain whether participants would give sufficient feedback to move forward in the design process. The answers we got gave us insight into some problems and reasons why people rejected the idea. First, people did not like the feeling of bothering others.

> ”No, I could not imagine sending others [to the store]. [Because] it would be an inconvenience to them, and we do not know each other that well” (Quote from one of the participants).

Second, the extra time and coordination of collecting and delivering groceries for their neighbours were perceived as challenging. In addition, some of the participants said they did not think the service could give enough incentives so that it would be worth the extra time and work (extra bonus points or getting to know their neighbours better was not enough). However, all the participants used online grocery shopping for ordering groceries for the whole week, so some of them could imagine that the *Cartpooling* service could be applicable

to supplementary shopping. However, when we asked the participants whether they would like to allow their neighbours to shop for them, the response was that, unless they were so ill that they could not do it themselves, the participants would not want to ask their neighbors.

Analysis of data

To analyze the interview data, we used thematic data analysis as described in chapter 3.5.1. The transcripts from the interviews were analyzed by looking for patterns and categories based on the predefined questions from the interviews.

When analyzing the data, we found that all the participants perceived grocery shopping online as being safe, mostly because of their experiences with shopping other things online. Yet participants were generally uncertain about some product groups, such as fresh and frozen goods. This uncertainty was displayed through the examples they used. All participants felt that it was important that they got the exact products they had ordered. One participant said:

> ”If I order karbonadedeig [a kind of ground beef] and I get familiedeig [a different kind of ground beef], I would have lost my temper. Or if I ordered Coke Zero and got Pepsi Max, it would not have been good.”

Another piece of feedback uncovered that it was unclear whether or not the groceries were in the store. This created some uncertainty among some of the participants. Some of the participants were also skeptical of having employees or neighbours collecting their groceries. This was mentioned by one of the participants:

> “When others collect groceries for me, I’m a bit skeptical that they might choose some products with stains that I would not have chosen for myself. I have not had such experiences, but I have had some avocado deliveries where the avocado is brown on the inside. Perishable products as fruit and vegetables are the worst to shop online since I have an inherent skepticism about how the products look.”

Therefore, we suggest that product risk is present when buying groceries online, although customers report that they trust the service in its entirety. We also noticed that there was a general unwillingness among participants to rate their neighbours. Participants did not want to bother others. Some participants felt that their privacy would be invaded if the neighbours

got to see what products they bought. This suggests that there is social risk associated with a service like *Cartpooling*.

Validity

Some of the questions we asked the participants were standardized, such as the questions asked at the start of the interview, concerning their background. Some of these were possible to quantify. However, our analysis of the interviews did not rely on the quantitative data, as these were not of importance for the goal of the interview. The data we gathered in the interviews were mainly qualitative. In this context, Mason (2002) claims that one does not depend on asking the participants the same questions in order to make analytical comparisons of the data. She states: "[...] you may well need to ask different questions of your different interviewees – precisely so that you can generate situated knowledge with all of your interviewee" (p. 66). Mason further explains that the comparisons depend on the research question and that it is likely that the analysis and arguments are based on themes identified from the data. This is something we experienced when analyzing data from the interviews. Many of the prepared interview questions were related to the research question. In this way, the responses were compared in relation to the research question, by identifying recurring themes.

4.3.2 Workshop

Background

The goal of the workshop was to explore some of the issues we discovered in the interviews. After talking to AB Food, we decided to keep and to work further on the crowdsourcing concept *Cartpooling* as a topic for the workshop. Even though the interview participants were negative toward *Cartpooling*, we wanted to keep exploring and collect more data before making a decision on which concept to proceed with. We wanted to involve all possible stakeholders in the workshop to generate ideas from various viewpoints.

Planning and execution

Before conducting the workshop, we had to plan the following: what kind of workshop we wanted to conduct, how many and which participants to include, and which techniques to include. A detailed agenda (appendix B) was made in order to control both what we would say and what we would do, in the right order. Because the workshop was conducted during working hours, the participants would be paid and no monetary reward was needed.

Because we used a service design thinking approach, we wanted to arrange co-creative activities and include different stakeholders in the workshop. Our contact person with AB Food invited the participants, which consisted of executive and non-executive employees, designers and developers. We agreed on conducting the workshop in their offices. To better plan the workshop, we gathered information about the participants' professions ahead of time. This information helped us divide the participants into two groups, and ensure both groups had participants from multiple disciplines.

The technique we used for the workshop was the future workshop, as mentioned in chapter 3.3.3. Future workshop is not a traditional service design technique. However, we found it to be suitable and in line with service design thinking because of its holistic approach to idea generation. We decided to extend the implementation phase with the technique customer journey map because we wanted participants to visualize their ideas so that everyone could get a clear and common idea of how the proposed service would operate. At the end of the workshop, the groups would come together to present and explain their customer journey maps. We argue that the creation of customer journey maps contributes to the objective of this research project to extend the understanding of risks associated with online grocery shopping.

A couple of days before the workshop, we arranged a pilot workshop with three participants in order to evaluate the techniques and to get feedback on the process and our roles as facilitators. The pilot workshop was useful as it turned out that we had planned too many activities. Based on the experience with the pilot, we ended up changing the agenda and removing one of the activities to make more time for the ones described above.

In total 8 participants were present at the workshop. The number of participants is within the recommended size according to Polaine and colleagues (2013). They state that the ideal size of a client workshop is 6 to 12 participants. At the start of the workshop, we arranged a common session with all of the participants wherein we introduced ourselves as facilitators, encouraged everyone to introduce themselves, and provided practical information about the workshop before we divided the participants into two separate groups for the activities. One facilitator was responsible for each group. The groups presented their solutions for each other at the end of the session. After the presentations of the solutions, we summarized and then participants gave a short evaluation of the workshop.

Results

The groups identified the following issues concerning *Cartpooling* in the critique phase:

- Individual preferences. The participants mentioned that it could be difficult for neighbours to know about other people's preferences.
- Purchase behaviour can be personal. Some people might find some groceries to be of a private nature and would therefore not want to share these purchases with others.
- Trust in the chosen products. Do the people collecting groceries choose the right groceries of good quality?
- Loss of shopping experience, when shopping groceries online.
- Difficult to give critique or feedback to your neighbour. In case something goes wrong with the collection of groceries or delivery, it can affect the relationship with the neighbour.
- Payment. Difficult for the elderly to use the service.
- Strangers at the door. People are not comfortable letting unfamiliar neighbours into their homes.
- Is there a need for the service? Important to find out if the service is feasible.
- Who is responsible? A challenge is to identify who is responsible in case something goes wrong.
- Do not want to bother others. Many people may be hesitant to ask others to shop for them because people do not want to bother others, or they may feel obliged to returning the favour.
- Heavy and time-consuming. Many items to carry and collection of groceries takes time.
- Delivery time. It can be hard for both parts to manage and plan when the groceries should be delivered/received.

In the implementation phase, each group decided to work further with one of the ideas from the fantasy phase, which was visualized in a customer journey map. One member of each group held a short presentation of their proposed service. The two services are presented below, with customer journey maps giving a visualization of the process. The descriptions of the customer journey maps are in Norwegian because the workshops were conducted in Norwegian.

Housing Cooperative

This is a service that would be offered by a housing cooperative,[11] to help customers with grocery shopping. When registering, customers indicate who they are and their preferences. The housing cooperative hires a dedicated person to collect groceries for the online orders. This person is dedicated to serve the same returning customers. When the customer submits an order, the professional employee receives it and goes shopping. The delivery is scheduled within fixed hours, and the invoice is applied to the customer's monthly rent statement. The customer has the possibility to give the dedicated person feedback so that he or she can do a better job in the future. Figure 9 presents a customer journey map of the Housing Cooperative Service [12].

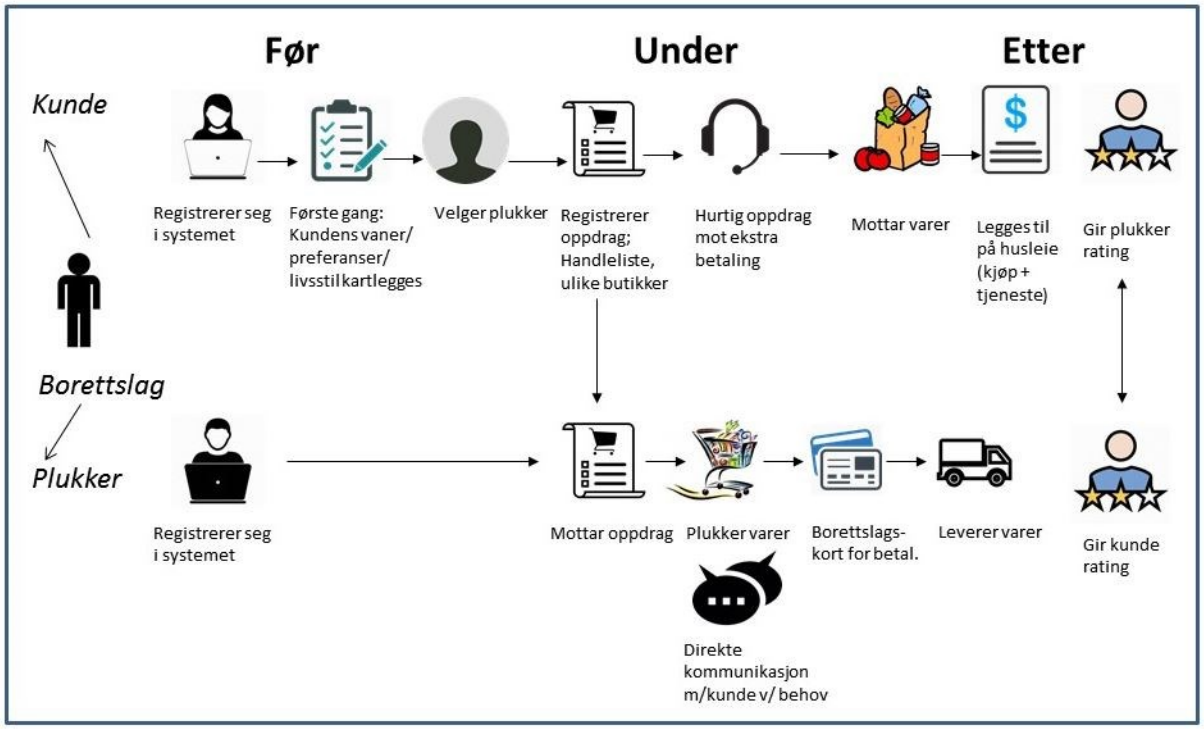

Figure 9 Customer journey map of the Housing Cooperative Service

Elderly Service

The focus of this service is to help those who need help: the elderly. The service is in collaboration with the home care or Visitor Services[13] The Visitor Services provides volunteers to visit the lonely and ill, often elderly and refugees. The proposed Elderly Service consists of four actors; the elderly, the Elderly Services, employees collecting the groceries, and volunteers delivering the groceries, the latter two being organized by the Visitor

[11] Translation from the Norwegian word *borettslag*
[13] Translation from the Norwegian word *Besøkstjenesten*

Services. The elderly contact the Elderly Service by phone to order groceries. The Elderly Service submits an order on behalf of the customer. The order is sent to AB Food and the groceries are collected by them. A person from the Visitor Services collects the groceries in the store. The person visiting the elderly receives a message from the Elderly Service that the order is on its way. Figure 10 presents a customer journey map of the Elderly Service.

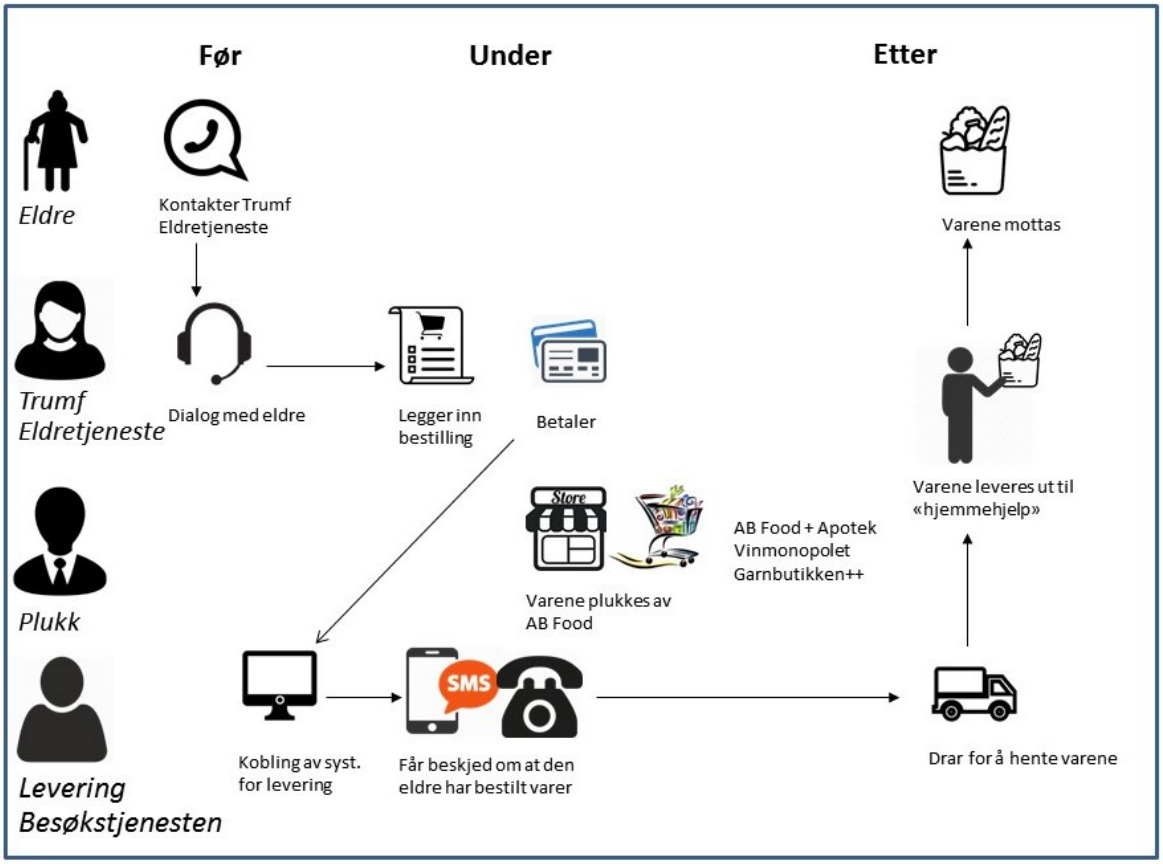

Figure 10 Customer journey map of the Elderly Service

In both of the proposed services, the *Housing Cooperative,* and the *Elderly Service*, the person who collects groceries was switched from the familiar neighbour in the *Cartpooling* service to a professional employee. Due to the similarities between the two proposed services, we chose to proceed with only one of them. We chose the *Housing Cooperative* service because out of the two new ideas it differed the most from *Cartpooling*. The most significant difference between the *Housing Cooperative* and *Cartpooling* is that in the *Cartpooling* service, the actors know each other and the person collecting groceries is a private person, while in the new proposed service the actors are not familiar with each other at the start, and the person collecting groceries is a professional.

Based on the results of the workshop we were interested in finding out whether it was essential who delivered the groceries with regards to how easy it would be to give feedback on the delivery. We also wanted to find out whether changing the actor to a professional would increase customers' perception of the employee's ability, and whether it would result in a reduction in the perceived risk associated with product quality. In order to investigate this further, we compared the *Cartpooling* service, which used a familiar actor, the neighbour, to deliver the groceries, with the *Housing Cooperative* service, using an unknown actor from a third party company, to deliver the groceries.

Validity

Because we were two facilitators, we had the benefit of dividing the participants into two groups. Each of us had the responsibility for one group. In this way, there were four participants and one facilitator in each group. We believe this was an appropriate size, as we wanted to make sure everyone had the opportunity to speak. The selection of participants for each of the groups was made carefully because we wanted multidisciplinary teams. In line with service design thinking, we believe a multidisciplinary team of stakeholders contributes to fruitful discussions and creative idea generation. However, having executive and non-executive employees participating in the same workshop may have affected the results. When the employer was enthusiastic about one particular idea, there is the possibility that some of the non-executive employees held back their honest opinions. Even if they did not agree with their employer, they may have felt pressured to do so.

4.3.3 Observation

Background

After collecting data from the interviews, we saw the need for gaining insight into how employees handle online orders from customers. This was necessary to be able to create a service that could easily be offered by employees at AB Food. We, therefore, chose to conduct employee observation, which is often used to examine the context of technology use in the workplace (Lazar et al., 2010).

Planning and execution

The location for the observation was set "in the field," more specifically to a grocery store in Oslo. Our contact person at AB Food helped us get in touch with the manager of one of their stores. One of the benefits of observation in the field is that it can provide details about how

users behave and use technology. Observation also gives an understanding of the context of technology use and can provide answers to how or why activities are happening. Experts tend to have a framework to structure and focus their observation (Sharp et al., 2015). In the planning phase, we, therefore, made a list of things we wanted to look for while observing (appendix C). We also made a list of questions for a short interview, in case one of the employees would have the time. Because it can be difficult to understand what people are doing through observation alone, we could get a more complete understanding by conducting an interview.

We observed an employee directly following him around in the store while he carried out his job. While observing we took notes of what we saw and heard. Because it is important to write down as much as possible when observing things of interest, we carried notebooks. Besides taking notes, we encouraged the employee to think-aloud and to narrate what he was doing.

Figure 11 The trolley, cash register and groceries used for collecting groceries

After the observation, which lasted for 30 minutes, we conducted a semi-structured interview with the employee. We asked questions about what a typical workday looked like and more details about the process of collecting groceries.

Results

Based on the notes from the observation and the small semi-structured interview, we made a thorough description of the different procedures that were put into action from the time the store received an order to the time the groceries were given to the couriers.

By shadowing an employee while he conducted everyday work tasks, we gained insight into the different procedures required when and were able to make a thorough description of the process of, collecting groceries. We realized how much more complex and detailed the process was than what we had imagined. For instance, the route through the store was planned in a way that did not include going through the cash register to register the groceries. The system also registered the order and presented it in a specific way, based on where the groceries were placed in the store. There were different hygienic

procedures such as measures to keep frozen and refrigerated wares cooled and using rubber gloves when gathering fruits and vegetables.

Validity

According to Lazar et al. (2010), observation might require considerable practice. Although we have conducted some observations before, we would not consider ourselves experienced observers. Therefore, we prepared the observation plan by writing down possible things to look for. It was also a benefit to be two people observing. According to Sharp and colleagues (2015), working in a team enables different perspectives, and can give more reliable data because observations can be compared. While observing we took notes, and immediately after the observation, we compared our notes and discussed them with each other.

4.3.4 Interview with housing cooperative board leader

Background

After we got insight into the processes of collecting groceries in the store, we felt the need to get insight into how a process with a housing cooperative would work and whether the *Housing Cooperative* service seemed feasible. We, therefore, decided to conduct a short interview with a board leader in a housing cooperative to identify possible challenges.

Planning and execution

We contacted a local housing cooperative and asked for an interview with a board member. We decided on a semi-structured interview because we wanted to have a predefined structure with the flexibility of asking follow-up questions. We made an interview guide (appendix D) and printed consent forms (appendix I). The interview was conducted in Aria's home. The setting was informal, we provided coffee and snacks, and had a small bag of candy as a reward for participating. While interviewing the board leader, we started with a presentation of the *Housing Cooperative* by showing and explaining the customer journey map generated during the workshop, followed by a discussion based on the prepared interview questions.

Results

The board leader was positive and thought of the service as a good idea for a housing cooperative. She found it important that the *Housing Cooperative* was offered to residents as a voluntary service. During the interview, we discovered some issues with the service. We found that it would be hard to include the billing for the grocery orders into the rent because

doing so would require the involvement of a third party. The collective agreement between the company and the housing cooperative would also require a decision from the housing cooperative general assembly, which is normally held once a year.

Validity

As housing cooperatives are legal entities regulated by law, e.g. Burettslagslova (2003) [14], most housing cooperatives have the same or similar organizational structure and similar rules for providing services. We will, therefore, argue that interview with one board leader could uncover major issues for the *Housing Cooperative* service. However, there may be factors that vary between different housing cooperatives, including local rules, and the housing cooperative's willingness to try new services and offer new services to its residents.

4.3.5 Focus groups

Background

Based on the results from the employee observation and board leader interview, we determined that the *Housing Cooperative* service was feasible. We wanted to examine possible effects of a dedicated person collecting groceries for return customers. Therefore, we wanted to solicit feedback on the concept from possible users by conducting a focus group. The goal of the focus group was to present the *Housing Cooperative* service to explore whether a dedicated person serving the same customers could be a solution to the issue of receiving perishable products that do not meet the customers' preferences. We wanted to present both the *Cartpooling* and the *Housing Cooperative* services and compare these two in order to make a decision on which concept we should go further on with, and whether we should make any changes based on focus group participants' input. We chose to conduct a focus group because it was an efficient way of facilitating a group discussion that could provide a rich conversation and comparison of the two proposed services.

Planning and execution

We tried to make the setting informal and social; we provided coffee, tea, and snacks. The budget did not allow for other rewards for participation. We decided to divide the focus group in two because we did not want too many participants at the same time. There were six participants in the first focus group and five in the second. In the first part of the focus group,

[14] In English "The housing cooperative law"

participants were given information and the customer journey map regarding one of the concepts. After they read these, they were asked to answer questions from a questionnaire (more thoroughly presented in the next section). When everyone had completed the first questionnaire, we provided information, the customer journey map, and a questionnaire for the other concept. In the second part of the focus group, we conducted a discussion on themes related to trust. Both focus groups followed the same agenda (appendix E).

Results

The discussions from the focus groups indicated that out of the two services the participants showed more interest in the *Housing Cooperative* service. The participants found more negative sides with the *Cartpooling* service and thought it seemed complicated.

Some of the problems that were mentioned;

- Hard to keep track of groceries when buying for others. In which order should one collect the groceries; for themselves first or for others?
- The neighbour cannot carry many bags. It would be heavy.
- It is uncomfortable to rate the neighbour and the dedicated person but it is much worse to rate the neighbour!
- Availability related to what time the groceries can be delivered.
- Mutual favour. One does not want to owe the neighbour a favour.
- Privacy. One does not want the neighbour to see what one buys.
- Unfamiliar. Not everyone knows their neighbours.

When asking what the participants liked about the different services they pointed out that they thought both of them were good for the environment, elderly and parents with small children. However, what they did not like about the services was the rating of the person collecting the groceries. The participants felt uncomfortable with rating their neighbour and dedicated person but found it much worse to rate the neighbour. Instead of giving feedback in the form of rating, some of the participants suggested using comments for giving feedback, because comments would give information that is more valuable. They also suggested giving users the possibility of leaving comments in advance of an order. When comparing the two services, the participants answered that they preferred the *Housing Cooperative*. One thing that was mentioned as a positive side of it was that with this service the dedicated person

would over time learn to know the customer's habits and preferences and that a history or log would be important for the dedicated person to do a good job.

Even though the participants preferred the *Housing Cooperative*, they did have some objections to it. Some of them asked questions about whether or not it was necessary to have the same dedicated person collecting their groceries. If there would be a log registering customers' preferences and historic data on all purchases, there would not be a need for having the same person doing the job. The participants did not see the purpose of giving a rating because they anyway did not have the option of choosing which person would collect their groceries, as he or she was dedicated to the same customers.

Validity

The order in which the two solutions were presented to the participants could have had an impact on the results. We tried to address this by giving each focus group different solutions to start with. In this way, we could test both orders. However, giving the groups different starting points may have had an impact on the basis for comparison. Conducting focus groups and interviews requires skill and training (Lazar et al., 2010), which we, as not so experienced researchers, might not have.

4.3.6 Questionnaire

To make the comparison between the two services easier, we needed more quantitative data. We also wanted to ensure every participant had the possibility to have an influence, by having all participants answering questions. Therefore, we made a simple questionnaire, which we handed to the participants (appendix F). It contained questions regarding two of the seven areas related to risk (Jacoby & Kaplan, 1972): performance/product- and social risk. These risk areas were chosen because they had been recurring themes in our data gathering so far. The response alternatives were mainly formed as likert scales ranging from one to seven.

Sharp et al. (2015) claim that demographic data can be useful for putting the responses into context. However, they point out that this kind of information should only be collected if it is of relevance to the goal of the study. Therefore, we did not include questions on demographic information.

Examples of questions that were asked, where x is the actor:

- How comfortable are you with giving x rating after delivery?
- If you receive a bad perishable product from x, which rating would you give?
- To what extent do you think your rating will affect your relationship with this person?
- To what extent do you trust that x collects the expected groceries?
- To what extent do you trust that x collects groceries after your preferences?

These questions were asked to extend the understanding of risks associated with buying groceries online, explore ways of enabling customers to provide feedback about products. The questions were also asked to identify the difference in the perceived risk in the relationship with a familiar and unfamiliar actor in an online grocery context.

Analysis of data

For the analysis of the data from the questionnaire, we have used descriptive statistical analysis, as described in chapter 3.5.2. The responses from the questionnaire were analyzed by pulling out all the statistic data from both focus groups in an excel sheet. The data was sorted and grouped according to the question, meaning that the data from both of the focus groups concerning the same question were placed together. In this way, we could do a comparison between the responses for the two solutions *Cartpooling* and *Housing Cooperative*.

Results

When asked about how comfortable the participants would be when rating the *dedicated person* collecting the groceries; six were very comfortable (rated 6 or 7), and the rest were evenly distributed on the scale. When asked about how comfortable the participants would be when rating the *neighbour* collecting the groceries; seven were very uncomfortable (rated 1 or 2), three were uncomfortable (rated 3) and only one was very comfortable (rated 7). The results show that the participants are uncomfortable with rating someone they know and have a relation to, and they feel more comfortable rating a professional.

When the participants were asked how they would rate the *dedicated person* if the groceries were bad, eighth would give a bad rating, two would give no rating and one did not know. If the *neighbour* delivered bad groceries, one would give a bad rating, five would give a neutral rating, two would give no rating and three did not know. If the *dedicated person* gave extra

good service, nine would give a good rating and two would give no rating. If the neighbour gave extra good service, seven would give a good rating, three would give no rating and one did not know. The results show that the participants are uncomfortable giving a negative rating to someone they know. They would be more honest with a professional.

When asked to what degree rating would influence the relationship with the *dedicated person*, six participants answered very much (rated 6 or 7), three answered not much (rated 4 or 5), two answered almost no degree (rated 2). When asked how much the rating would influence the relationship with the *neighbour* seven participants answered very much (rated 6 or 7), four answered not much (rated 4 or 5). The results from this question give no indication or clear conclusion.

For the question: “To what degree do you trust that the dedicated person collects the expected groceries?” five participants gave a rating on 6 or 7, five rated 4 or 5, and one rated 3. When the participants were asked to what degree they trust that the neighbour collects the expected groceries, five rated 6 or 7, five rated 4 or 5, and one rated 2. The results give no clear conclusion.

When asked, “To what degree do you trust that the dedicated person selects groceries according to your preference?” five rated 6 or 7, the rest of the responses were spread evenly. When the participants were asked to what degree they trust that the neighbour collects groceries according to their preference, five rated 6, five rated 4 or 5 and one gave a rating of 3. Here, there is a slight tendency to trust the neighbour more.

For the question: “If the store was out of stock, to what degree do you trust that the dedicated person would find a good replacement?” four trusted much (rated 6), five trusted (rated 4 or 5), and two rated 3. When the same question was asked concerning the neighbour finding a good replacement, the answers were spread evenly on the alternatives from 2 to 6. This indicated that there was slightly more trust towards the professional.

When asked to rate the perceived risk of the *Housing Cooperative* service, five rated 2, four rated 4, one 5 and one rated 6. When rating the risk of *Cartpooling* the ratings were spread evenly on the alternatives from 2 to 6. The results are presented in figure 12.

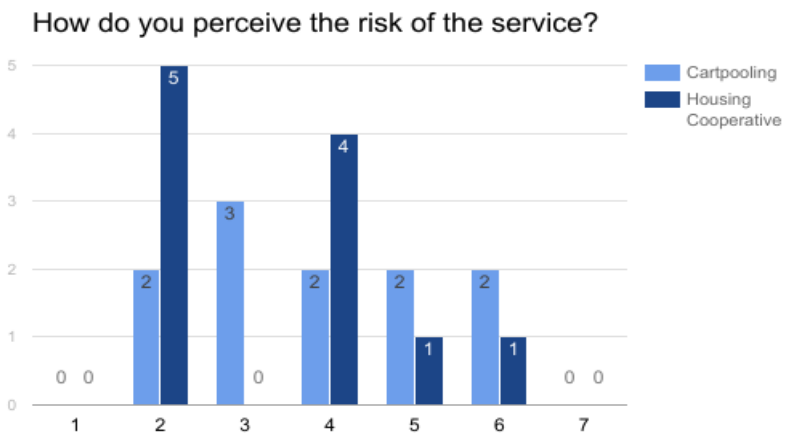

Figure 12 Statistical representation of the results of the questionnaire

Summary of results

The data indicates that the participants were more comfortable rating and giving negative feedback to a dedicated person serving the same customers, rather than to the neighbour. The dedicated person was also somewhat more trusted. This is also reflected in how much trust the different services have. The results give no clear conclusion in questions related to getting groceries of preferences (slight favour of neighbour), good replacements (slight favour of dedicated professional) or the ordered groceries (no favour).

4.4 Data analysis

In this part, we present the theoretical and practical aspects of the data analysis we have carried out in the discover and define phases.

When analyzing quantitative data we used descriptive statistical analysis, as described in chapter 3.5.2. For the qualitative data, we mainly used thematic analysis (see chapter 3.5.1). According to Braun and Clarke (2006), it is important that the theoretical position of a thematic analysis is made clear. We used a deductive approach, on a semantic level. This means that we analyzed the data by looking for recurring themes and patterns, by placing them in predefined categories based on the research question. The analysis of the qualitative data from the interviews were inspired by “the simple interview analysis for novices” presented in Lazar et al. (2010).

Data can be analyzed on a high and a fine level of detail (Sharp et al., 2015). We chose to do a high level of analyses where sentences and answers were the units of analysis. The data we

gathered in the discover and define phases of the project was mainly qualitative, except for the questionnaire. The more structured the data the easier the analysis (Lazar et al., 2010). As we have collected semi-structured data, we have tried to structure the data by sorting the responses into themes based on what topics we wanted to explore. Furthermore, the data has been sorted into categories of positive and negative experiences. In accordance with Lazar and colleagues (2010), we have attempted to find common structures and themes from the data, and we have identified important ideas that were brought up.

We have used verification strategies to work incrementally with verifying that the analysis is grounded in the data. This iterative interaction between data and analysis contributes to ensuring the reliability and validity of the analysis (Morse et al., 2002). Braun and Clarke (2006) also recommends becoming familiarized with the data by checking notes, transcripts, and original audio recordings, to increase accuracy. Another verification strategy we have used is sampling sufficiency (see chapter 3.6), to ensure we have a sample of participants that can represent the research topic.

The analysis

We tried to do the initial analyzes as soon as possible after the data was collected so that our memory of the events was as fresh as possible. In line with Lazar et al. (2010), our experience is that details are often forgotten, making it valuable to process the data early. In the first part of the design process, we came mainly to collect qualitative data from interviews, observations, and workshop. Quantitative data was generated through the questionnaire. We started by doing a debrief and taking notes of initial impressions. Then we made a short evaluation of the data gathering activity to improve future data gathering.

For the analysis of the quantitative data, we used descriptive statistical analysis, as described in chapter 3.5.2. We did this by giving a simple summary of the quantitative variables and drawing comparisons between the data. For the analysis of the qualitative data, we used thematic analysis (see chapter 3.5.1) with a deductive approach, on a semantic level. We did this by looking at the explicit meanings of the answers from the participants. The analysis focused on finding repeating patterns and themes. The deductive approach means that we identified the themes first based on the research question, and then we placed the data in the different categories of themes. We did this by reviewing the collected data linking it to the various questions we had made before collecting data. Then we grouped data by theme based

on the questions. In some cases, we found it necessary to categorize the data in categories such as p*ositive feedback, negative feedback, improvement, description of use, alternative use* and *potential new functionalities*.

When the data was loosely categorized, we looked for crosscutting and repetitive feedback. After this, we looked for findings that had not been categorized. Then we compared the various findings against each other to see if we could draw a conclusion in regards to the questions we wanted answers to at the start of the data collection. Based on these responses, we decided whether to proceed with the idea that had been evaluated, whether the idea needed improvement or if we should reject it.

A characteristic of service design is working in fast iterations. It would, therefore, be counterproductive to spend much time on extensive analysis of the early data collections. The reason we wanted a less formal analysis, is that we wanted to work swiftly in iterations and mostly needed answers to simple questions about concepts or prototypes. We were not interested in forming generalized theories or models. We did not have the possibility of gaining statistical valid data in regards to our sample size and representation. This lack of statistical valid data reduces the possibility and needs for thorough analysis. The reduced possibility for a thorough analysis is also why there was less need for unstructured and exploratory data from the questionnaire.

4.5 Summarizing the findings

Throughout this project, we have conducted seven different studies with a total of 36 participants with different backgrounds. In advance of all the studies, we have conducted pilot studies to discover potential errors or unclearness in the design of the different studies. Below is an overview of all empirical studies we have conducted during this project.

Study	**Number & Background of Participants**	**Main Findings**
User interviews	5 users consisting of customers of AB Food	The participants were not interested in shopping for their neighbours, or have the neighbours shop for them unless they were chronically ill

Stakeholder workshop	8 stakeholders consisting of executive and non-executive employees, developers, designers and researchers	With the new concept of *Housing Cooperative,* it was suggested to replace the familiar actor from *Cartpooling* to a dedicated person collecting groceries for the same customers. It was suggested that this person could learn about customers' preferences over time.
Employee observation	One employee working in one of the grocery stores of AB Food	Insight into the process of how employees collect groceries that has been ordered online.
Board leader interview	One board leader of a housing cooperative	Board leader thought the *Housing Cooperative* service could be feasible as long as it was voluntary to use it
User focus groups	11 users. The users were co-students, friends, and family.	The participants felt more comfortable giving feedback to the dedicated person rather than the neighbour, but preferred to give comments instead of ratings. A log recording history for each customer was proposed as a replacement for having a dedicated person collecting the groceries.
Stakeholders group interview	5 stakeholders consisting of executive and non-executive employees and designer	Results presented in chapter 5.3.1
Usability test with users	5 customers	Results presented in chapter 5.4.1
Total	**36**	

Table 7 Summary of all the different studies conducted throughout our design process

Table 7 presents an overview of the number of participants present at each study in the discover, define and develop phases, and gives a summary of the main findings for each.

When going through the results from the interview, workshop and focus groups we noticed some similarities. The proposed new concept of *Cartpooling*, aimed at helping neighbours

with shopping for each other, were of little interest to the participants. There were several reasons for why the participants rejected the concept; they did not like the feeling of bothering others, they perceived the process of collecting and delivering groceries as being challenging, and some of them did not think the incentives of shopping for others was worth the required time and work. We also noticed that all of the participants had the attitude that this service could be useful for chronically ill people, but not for themselves.

One of the challenges that were mentioned in the interviews with customers, workshop with stakeholders and focus groups with users, was that the participants did not want to give ratings or feedback to someone they knew. Our general impression was that most of the participants preferred the person collecting their groceries to be a dedicated person, rather than a neighbour or someone the participants knew from before. They felt more comfortable rating the dedicated professional. Although Bhatnagar et al. (2000) claim that financial risk and product risk are most dominant in online grocery shopping, our findings indicate that social risk is also present when buying groceries online. Instead of rating the dedicated person, the majority of the participants from the focus group preferred and suggested to give feedback in the form of comments. Although related services such as GodtLevert use rating, our findings demonstrate that customers prefer to give feedback in the form of comments.

As mentioned in chapter 2, Huang and Oppewal (2006) refer to studies showing that product risk is considered as being prominent for online grocery shopping, especially groceries that belong to the see/touch/smell categories, such as fruits and vegetables. Based on the studies, Huang and Oppewal (2006) claim that customers may risk receiving products that do not meet their expectations because customers have different preferences. We explored different strategies to overcome this risk. Our findings extend the understanding of risks associated with online grocery shopping, and confirm that product risk related to perishable products is a concern when buying groceries online.

One of the main risks that the participants identified with buying groceries online were the fear of receiving perishable products that do not meet their expectations. During the stakeholder workshop, one of the groups tried to solve this problem by lettings users give information about their preferences in advance of an order through the *Housing Cooperative* service. This service also wanted to use a dedicated person for collecting groceries for the same customers. The purpose was that this person could learn about the customers'

preferences over time. However, when *Housing Cooperative* was presented to the users in the focus groups, we found that the majority of the participants did not want the person collecting their groceries to be a dedicated person. This was because they did not want the person collecting their groceries to be someone they had a relationship with. The participants that suggested giving feedback to the dedicated person in the form of comments, instead of ratings, pointed out that the comments could be saved in a log. By having a log on each customer, the participants thought it would not be necessary to have a dedicated person collecting the groceries. We, therefore, decided to use employees for the collection of groceries, as used in AB Food's online grocery store today.

In general, we see that the recurring themes for the discover and define phases are:

- Reducing product risk by giving feedback about products in the form of comments to the employees collecting the groceries
- Increasing trust by making sure the ordered groceries follow personal preferences

The studies conducted in the discover and define phases have given us a foundation for making a decision on using the *Housing Cooperative* service as inspiration for the further development of new concepts in the develop phase. We decided to move away from the dedicated person from a third party company and go back to having the company's employee collecting the groceries, as it is today. However, these changes would make the *Housing Cooperative* service similar to the company's current online grocery store. This made us go back to exploring new ways of increasing trust in the current online grocery store. The data collection also helped us make a decision to move away from the *Cartpooling* service, as it was the service that most of the participants were negative to. The process of data collection helped in visualizing the selected concept through the creation of prototypes.

5. Prototyping and evaluation

In this chapter, we present our development of a new concept. Further, we present how prototypes for the concept were developed and evaluated. We use two different evaluation methods to evaluate the prototypes: group interview with AB Food concerning the first version of the prototypes, and usability testing on the second version of the prototypes with users in the target group. Further, we present how the new prototypes let us explore the initial research question on trust. In the table below a summary of the activities conducted in the develop and deliver phases are presented.

Study	**Double Diamond Stage**	**Prototype**	**Version**	**Nr. of participants**
Group interview	Develop	The *Stream*	1	6
		Tinder for Perishable Products	1	
		Preference Feedback	1	
Usability test	Deliver	The *Stream*	2	5
		Preference Feedback	2	
Interview on trust	Deliver	The *Stream*	2	
		Preference Feedback	2	

Table 8 Activities carried out in the develop and deliver phases

The usability test is followed by interviews on trust. However, we choose to present the usability test and interviews as two separate activities because they have different goals. The aim of the usability test was to investigate the usability of the prototypes. In the interviews on trust, our goal was to find out how the prototypes influence trust.

5.1 Background

Based on the findings during the design process, especially the last focus groups, we found that the initial concepts did not have the necessary support to be developed further. We,

therefore, decided to redirect our efforts and explore other concepts based on the theme of customer feedback and preferences. We acknowledge that it would be ideal to do another iteration of discover and define phases before moving towards the develop phase. However, working in fast iterations is a characteristic of service design. Therefore, we decided to not spend too much time on each iteration, and continue to the develop phase through prototyping and evaluation. During the discover and define phases we noticed the recurring themes of increased trust through customer feedback and reducing product risk through receiving groceries according to personal preference. Therefore, we wanted to continue to work with these themes.

5.2 Prototyping process

We have included different stakeholders in the design process. The design decisions and the prototypes have been created based on feedback and knowledge obtained together with users from the different activities, such as the workshop and focus groups. One of the ideas, that was suggested and elaborated in the first workshop and the focus groups, was that feedback and presence can increase trust when buying perishable products online. Because customers may have different preferences when buying perishable products, their feedback can help the employee to do a better job, obtaining knowledge about the customers' preferences. This is in line with studies referred to by Huang and Oppewal (2006, p. 13) where it was found that customers may have different preferences. Even though the products offered by the e-merchant are claimed to be of high quality, the customers can be dissatisfied if the products do not meet their expectations. Based on previous studies and our study, we propose the selection of groceries to be customized according to customers' preferences to increase the perceived ability of the employees. The employee is provided with information about the preferred products by customer feedback.

From previous research done by Nepomuceno et al. (2014), we know that giving customers more information about products is one way of reducing perceived risk of buying online. In fact, providing more information about the products can make the customers feel more confident about buying them online (Nepomuceno et al., 2014). When we developed the two prototypes this was something we kept in mind. We wanted to explore different forms of giving customers more information by giving the customer a feeling of being present in the grocery store through photos and video. This was done to reduce the perceived risk. To address the fact that customers may have different preferences on perishable groceries we

found it important to explore different ways of enabling users to give feedback when buying groceries.

5.3 First iteration of prototypes

Based on the idea that customers feedback on groceries will improve the employee's knowledge about customers preferences and hence their ability to select groceries, we developed prototypes. The development of prototypes is common both in service design and technology research. Prototyping is a way of addressing our objective of extending the understanding of risks associated with online grocery shopping. It also helps in exploring ways of enabling customers to provide feedback to the person collecting groceries. The prototypes are presented below.

The Stream

The *Stream* is a video-based service, which presents the process of collecting the actual groceries from the store before they are delivered to the customer. The video is recorded from a small camera attached to the employee collecting groceries.

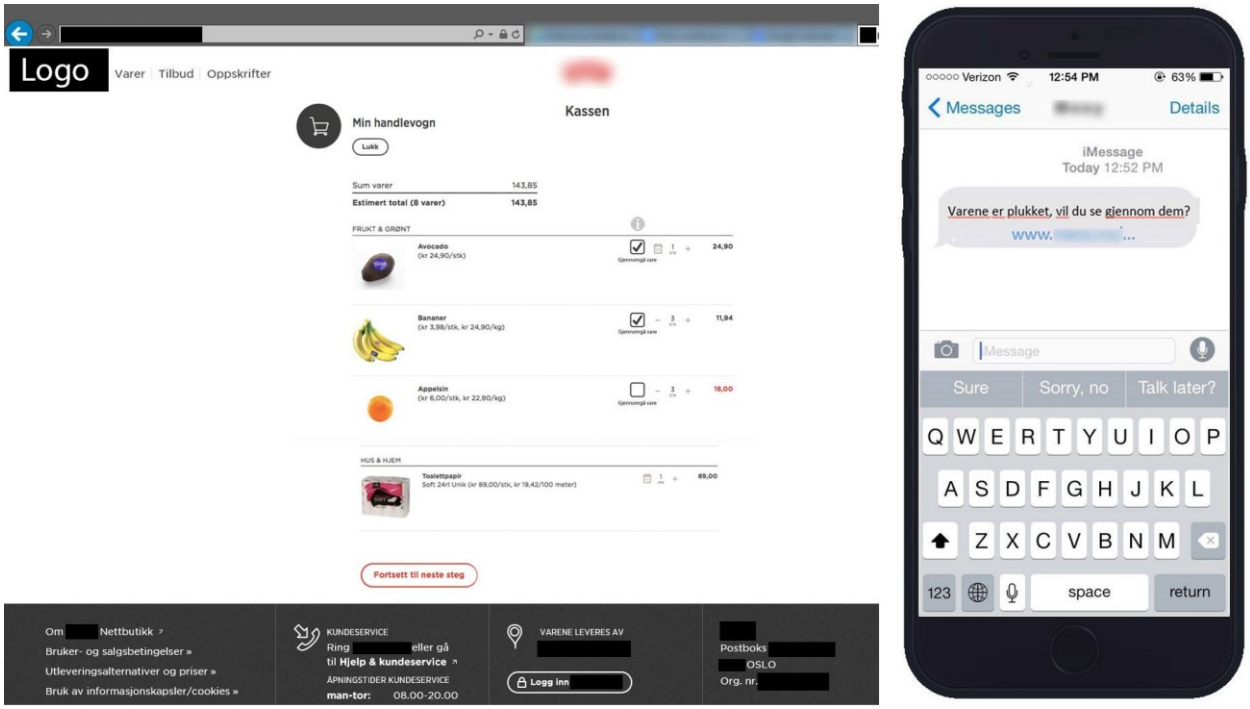

Figure 13 Confirmation screen and SMS/email from the online grocery store

After choosing groceries in the online grocery store, the customers are asked to confirm the order. Further, they have the option of reviewing the groceries before they are delivered at the door. When the groceries are collected in-store, the customer receives an email or SMS with a link to a video of the collection process (figure 13).

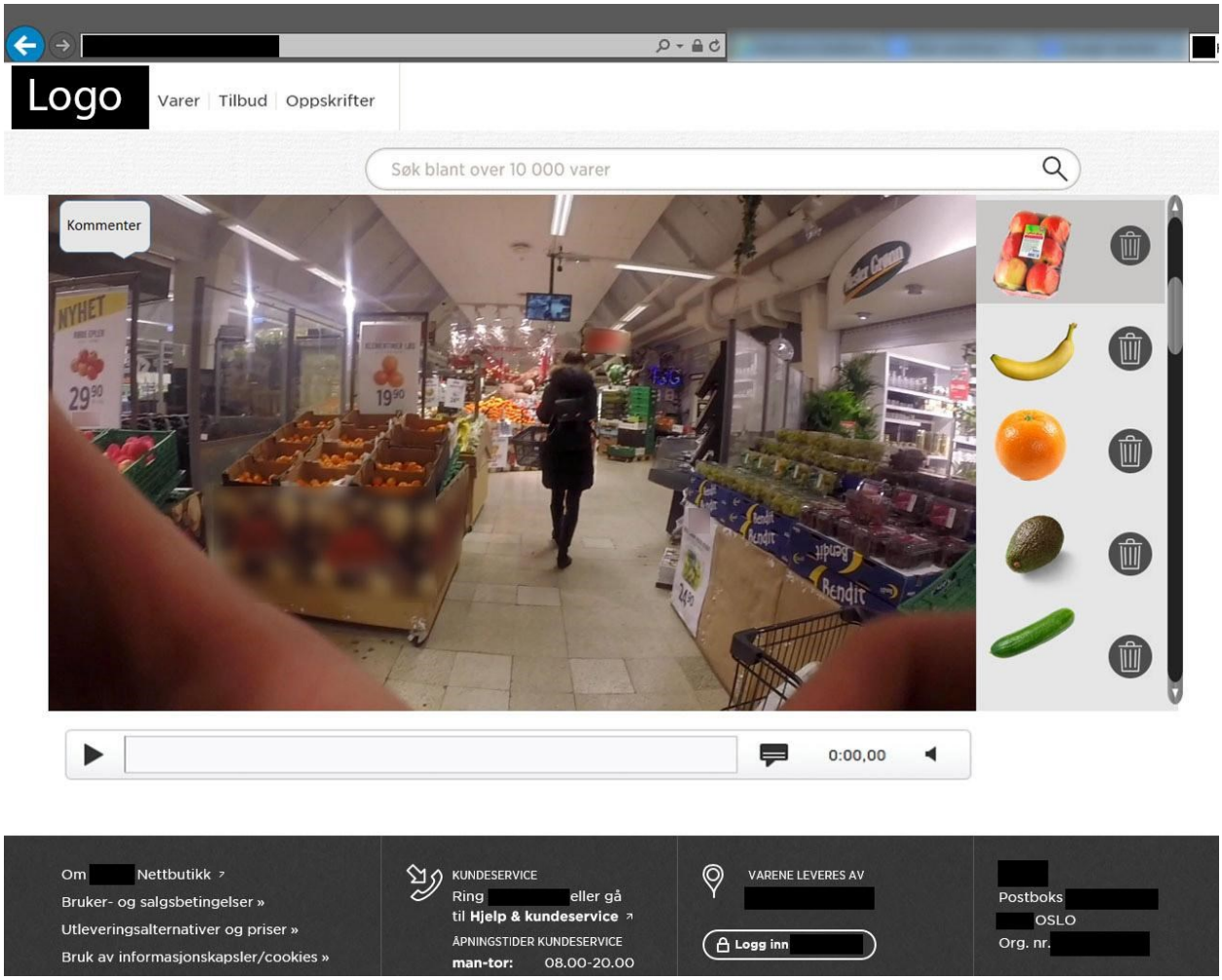

Figure 14 Screenshot of the video on the web page

In the *Stream* prototype (figure 14), customers are able to look at the different groceries, add comments about them, and request other groceries if the chosen groceries are not according to customers' preferences.

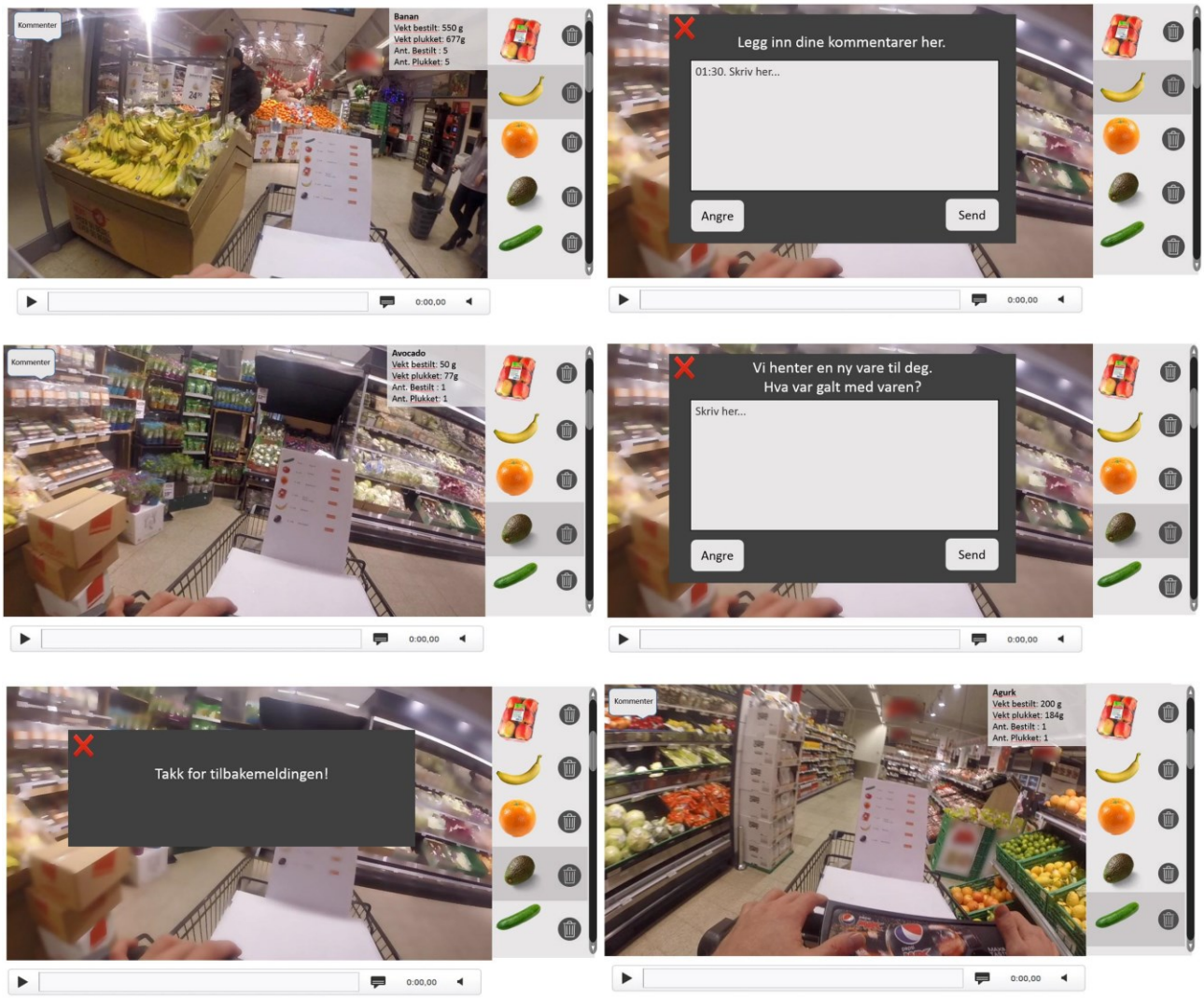

Figure 15 Screenshots of the user interface of the Stream with the video, comments, and requesting other products

The customers are given the possibility to watch certain parts of the shopping route in the grocery store. When the employee is headed towards the department of perishable products, the camera is turned on and the grocery shopping is video recorded. In this way, the customers may feel as if they are present in the grocery store. If the customers do not want the groceries that the employee has chosen or they have other comments, the interface enables the customer to discard products or leave comments within a fixed period before delivery (see figure 15). If so, the employee will receive a notification and respond to the feedback from the customer.

We made the prototype through simulating the creation of the service, by roleplaying. We taped a small camera to our chest, and then gathered a small sample of groceries. The different screens were made by manipulating selected screenshots of the existing online

grocery store. The user interface and video were presented in PowerPoint, with the possibility of interacting with the different elements. The process of video recording gave us a sense of whether the service could be intrusive. The role playing envisioned how the recording could be done in a realistic setting. From our experience, the process did not require much effort. We believe it would be feasible to manage the video recording, as it would not affect the current procedure of collecting groceries to any important degree.

Tinder for Perishable Products

Tinder for Perishable Products is a prototype based on the idea of using photos for approval and disapproval of products. It was inspired by the dating service Tinder, where you "swipe" profiles to the right if you would like to connect with them. The idea was that this was a fast and simple way of giving feedback about the groceries. When buying groceries online, the customers are given the possibility to review the perishable products that the employees select. After choosing groceries in the online grocery store, the customers choose which groceries to review. Then the customers confirm the order and pay. When the groceries are collected in-store, the customers receive an SMS with a link to the interface, which presents the products with the option of keeping or discarding the groceries. If the customers choose to keep the product, the interface (figure 16) will present the next product. If the customers decide to discard a product, they will be asked to explain what was wrong with it to help the employees choose a new one that meets the customers' preferences.

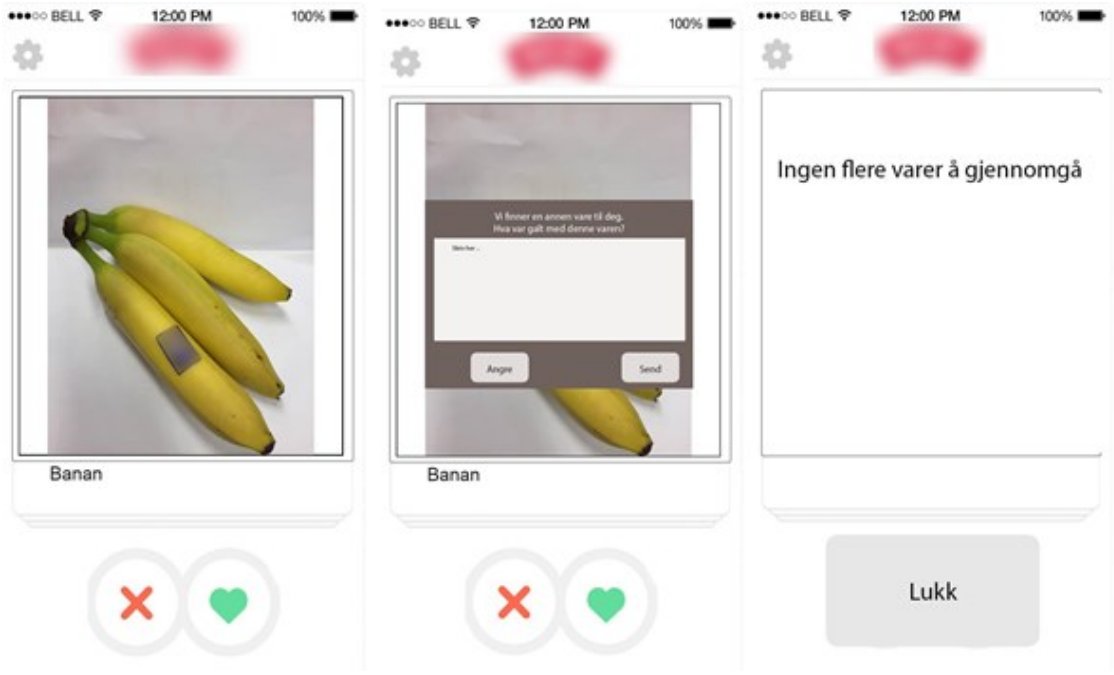

Figure 16 Screenshots from the user interface of Tinder for Perishable Products; product image, comment field, all groceries reviewed

Figure 17 Taking pictures in the grocery store with a camera phone

The prototype was made by making a user interface in Photoshop, inspired by the dating app Tinder. The prototype was presented in a static PowerPoint presentation. To test how feasible the solution was, the pictures were taken in the grocery store, with a camera phone. The products were placed on a simulation of the cash register on top of a trolley. The simulation of the cash register was made by using a shoe box with the lid covered in white paper (see figure 17). In this way, the pictures were taken on a white surface and background to ensure a clear image. The pictures were of good quality, and we experienced the picture taking as manageable, although it was a bit time-consuming.

Preference Feedback

Preference Feedback prototype lets customers give feedback by leaving comments about perishable products, either during order or after delivery. We decided to let the customers write optional comments about individual products when ordering groceries. The decision was based on suggestions from the participants from the focus group of enabling customers to leave comments when making an order, instead of rating the employee when the groceries were delivered. The decision was also based on an idea that was generated in the workshop with AB Food; to have customers document their preferences when registering as new customers. The idea of leaving comments on each product is an extension of the possibility to give comments in the current online grocery store. However, in the current online grocery store, the comment is general for all types of comments and is entered at the end of the order. We wanted to let the customers comment the order on a product level, instead of a general level.

After the groceries have been delivered, the customers receive an SMS with a link. The link leads to a form with a question on the satisfaction with the delivery. If the customers are happy with the groceries, they have the option of giving positive feedback. Otherwise, they will be presented with a list of images of the products received, and the customer has to choose which product(s) it concerns. The next step is to write a comment on what was wrong with the product. The feedback will help the employee when selecting groceries for that specific customer in the future.

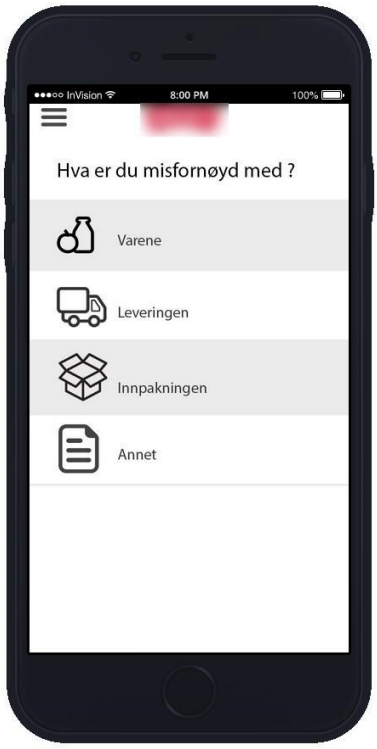

Figure 19 Giving users the option of choosing category for what they are dissatisfied with

The user interface of the *Preference Feedback* prototype was created in Photoshop. We made it interactive in a prototype tool called Invision[15], which made the prototype easily accessible on mobile devices.

Figure 18 shows the interface of the prototype placed in an iPhone frame. This is the way the prototype has been presented to the users because we wanted to give them a more realistic feeling. The question asked is "What are you dissatisfied with?" with the options of choosing "the groceries", "the delivery", "the packaging" or "other".

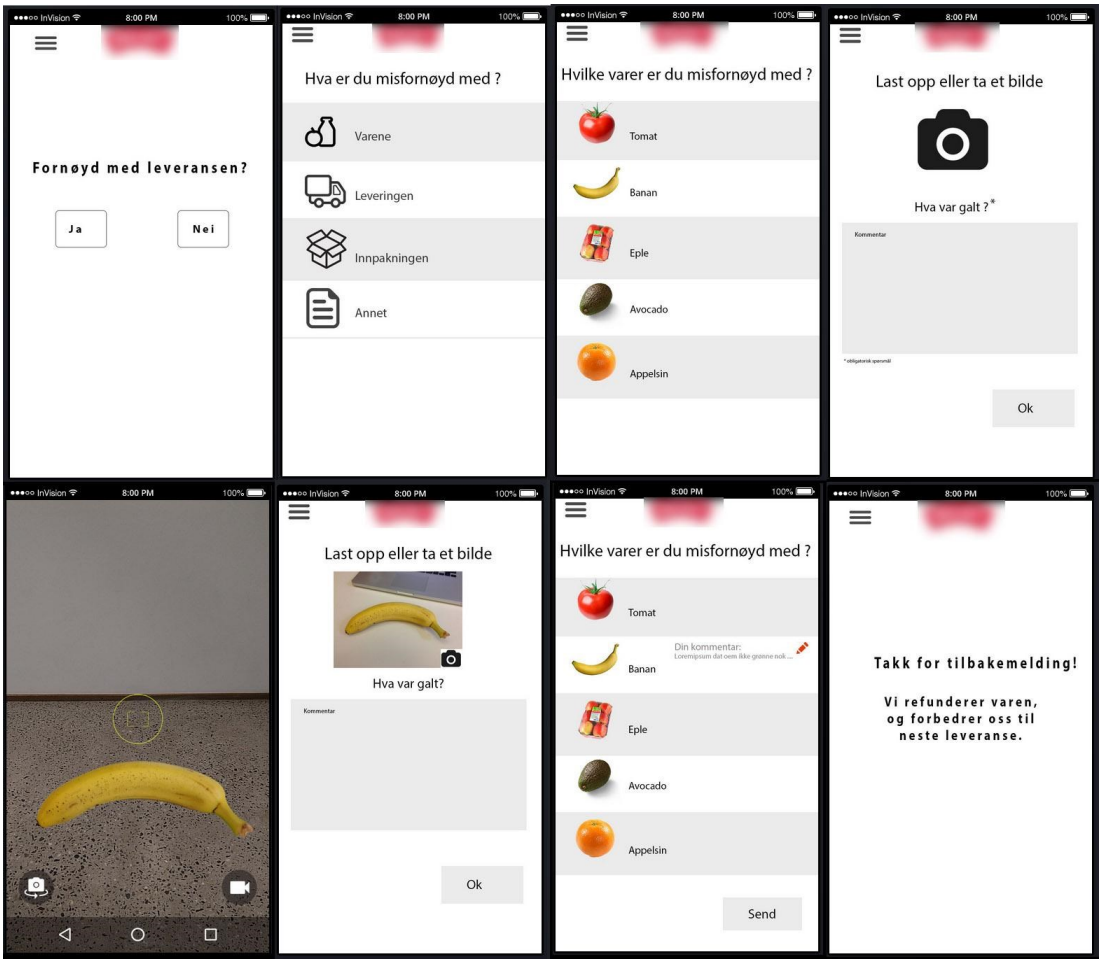

Figure 18 Screenshots of the Preference Feedback prototype

15 Invisionapp.com

Figure 19 starts with the front page of the prototype, which asks the customers if they are satisfied with the delivery. The rest of the figure presents what happens if the customers click "No" on the front page.

5.3.1 Group interview

Background

The first versions of the prototypes were evaluated with the aim of receiving feedback on the concepts and ideas, from the business perspective. Therefore, we chose to evaluate the prototypes by conducting a group interview with a mix of stakeholders. The stakeholders included executive and non-executive employees from AB Food, in addition to a designer from a consultant agency cooperating with the company.

Planning and execution

For the evaluation of the first versions of the prototypes, we conducted a group interview at AB Food's offices. Before the evaluation, we conducted a pilot evaluation with two participants, and the two of us acting as the facilitators. The goal of the pilot evaluation was to get practice in presenting the prototypes and to get feedback on the questions we had formulated. The pilot turned out to be very helpful as the participants told us they felt some of the questions were too similar to each other. We, therefore, ended up changing some of the questions. The group interview plan is described in appendix G.

In total six participants were present at the group interview. Four of the participants were employees at AB Food, one was from a consultant agency and one of us acted as the facilitator. After introduction and practicalities, the evaluation started with a demonstration of the first prototype the *Stream*, followed by a discussion on themes related to trust, advantages, and disadvantages of the prototype, and suggestions for improvement. The same procedure was followed for the other two prototypes *Tinder for Perishable Products* and *Preference Feedback*. The group interview was held in working hours. This means that the participants were paid to take part in the study, and we did not need to think about providing any rewards for participation.

We made questions related to trust, knowledge, skills and competence inspired by Lu, Zhao, and Wang (2010) questions. Their questions were also related to the four trust antecedents (Gefen et al., 2003). The questions about knowledge, skills, and competence were put into the

context of online grocery shopping and translated to Norwegian. However, when translating the questions we noticed that they got quite similar so we had to revise them and skip some of the skill related questions. This decision was based on feedback from the pilot. Some of the questions were related to trust in the current online grocery store and trust in the employees, to get an idea of the baseline. Other questions were asked to identify how the prototypes affected the customers' perceptions on trust. In addition, we used Jacoby and Kaplan's (1972) definition of product risk as inspiration for the formulation of some of the questions.

Analyzing the data

The collected data from the group interview has been analyzed by transcription and review of the audio recording. We compared the questions asked and the answers we got and did a thematic data analysis as described in chapter 3.5.1. This means that we looked for recurring patterns and themes when going through the data. The type of thematic analysis we used was the deductive approach, meaning that the thematic categories were predefined based on the research question (Braun & Clarke, 2006). When going through the data we placed relevant data in the corresponding categories.

During the evaluation, the participants discussed topics related to trust, and gave their opinions on advantages and disadvantages for the different prototypes, mainly from the business perspective. In addition, they gave suggestions on how the prototypes could be improved. The main findings are listed below.

Results

The Stream prototype

The predefined thematic categories for the *Stream* prototype were: *preferences, knowledge, quality, advantages, disadvantages,* and *improvements*. The categories were related to the prepared questions from the interview. The results from each category are presented below. When discussing the question "Does the prototype give the employee knowledge about customers' *preferences*?" the participants thought it depended on the situation. This was explained by one of the participants:

> *"*If the customer has registered a comment they [the employees] will know.*"*

Another participant further elaborated:

> *"*It needs to be stored on the customer. If the comment is stored on the customer the employee will build experience.*"*

On the question of whether the prototype shows if the employee has *knowledge* about the products, the two participants that answered had different opinions. One was not sure, while the other one thought that the purpose of the prototype was to show that the employee has knowledge about the products.

> *"*They [the employees] want to show that they have knowledge about the groceries. I think this is the message. When filming yourself collecting groceries for others, you don't fool around!*"*

One of the participants thought the prototype could improve how the employees collected groceries, and that it could lead to the collection of more *quality* products. The participant suggested the following:

> *"*It could have been wise if the employee did not know which customers wanted a video and which ones did not. That would have been a sharpening in itself. The customer has the possibility to see the groceries that have been collected, but the employee does not know which customer it belongs to.*"*

Another participant followed up on the suggestion and thought it would create trust for the customer:

> "It creates trust for the customer too, that they know the employee does not know. The customer would not be afraid that he would take it easy."

Another participant commented that the video shows that the employee is shopping in a physical store and that the groceries are of quality.

The participants' opinions about the *advantages* of the prototype are listed below:

- The prototype is viewed as the most innovative and exciting of the three presented prototypes.
- One sees more of the product.
- It takes hold of the uncertainty with shopping perishable groceries online
- Everything is more transparent and becomes very visible, which builds trust to the customers because they feel they are present.
- The prototype emphasizes that the service provider is as concerned about the quality as the customer is.

The participants' opinions about the *disadvantages* of the prototype are listed below:

- The filming of the shopping route sets the standard for how it looks like in the store.

- One needs to be careful of anonymizing faces and one should not record more data than needed.
- The service is demanding for the service provider. It is time-consuming because the employee needs to collect groceries all over again and it is inefficient.
- Unsure if there is a need for it. Does the customer want to watch the video?
- The customers shop online in order to save time, but the service is not time-saving if the customers spend 20 minutes watching the video.

The participants' suggestions for *improvements***:**

- Add more information in the prototype such as quantity, weight, and price. This can create trust because the customer sees that he or she receives the same as ordered.
    - Important to not present too much information at the same time
- Add comments from the customers on individual products.
    - The comments should be saved in the customer register so that the customer does not need to write the same comment later
    - Update the customer register with eventual comments provided in this prototype
- Option of adjusting the speed of the video
- Anonymize sensitive parts of the video such as people's faces, by censoring them
- Add a bot-service in real time that enables communication between the customer and the employee.
- Solve the issue of the service being time-consuming by asking customers to provide their preferences in advance. If they still want to control the groceries before they are delivered, they can get access to this service.
- Instead of filming all of the groceries, having the option of choosing if or which groceries should be reviewed, in the same way as with the *Tinder for Perishable Products* and *Preference Feedback* prototypes. This will also increase the efficiency.

Tinder for Perishable Products prototype

The thematic categories identified for the *Tinder for Perishable Products* prototype were: *preferences, advantages, disadvantages,* and *improvements.* These categories were related to the prepared questions. The results from each category are presented below.

When discussing the question "Does the prototype give the employee knowledge about customers' *preferences*?" the participants commented that this would work similarly as with the *Stream* service because it depended on the situation. If the employee has not received any comment from the customers about what they want before collecting the groceries, this prototype will provide the employee with comments from the customer if the groceries did not follow the preferences. In the same way as with the *Stream* prototype, the employee will learn about the customer's preferences if comments are stored. The participants did not think that the prototype gave the customers information so that they could see that their preferences were followed. A participant gave the following comment:

> "No, because I don't see the back. I don't know if the grocery is rotten when I only see it from one angle."

The participants' opinions about the *advantages* of the prototype are listed below:

- Nice function with checkboxes for selecting which groceries one wants to go through before delivery.
- This prototype is more efficient for the customer (than the video).

The participants' opinions about the *disadvantages* of the prototype are listed below:

- Inefficient. One cannot take pictures of one grocery at the time
- Difficult. One needs to swipe and turn the groceries 360 degrees and that is complicated for the employees to implement
- This prototype is not feasible
- The groceries are not so visible, especially when presented in a bag, and we only see them from one angle
- Difficult to present fish or meat that are wrapped up
- It can increase food waste in the stores because one easily rejects food

The participants' suggestions for *improvements:*

- Use this service for special orders such as catering, cakes, delicacies, fish and meat or groceries ordered by weight[16].
- Use this service for replacement groceries instead. In the service, one could inform if groceries are out of stock and suggest other groceries. The suggested groceries could

[16] *Løsvekt* in Norwegian

be presented with an image with the customer responding with yes or no for whether or not customer approve it.

Preference Feedback prototype

The thematic categories identified for the *Preference Feedback* prototype were: *preferences, advantages, disadvantages,* and *improvements.*

The participants thought that the employee would have competence about users' *preferences.* The reason being that he or she gets information about what the customer likes in advance of the delivery. The employee also gets experience from feedback provided by customers after delivery. In general, the customers thought that the prototype would give the employee knowledge about customers' preferences. However, the prototype would give knowledge about the preferences only if the feedback that customer support received from the customers were sent back to the store. They further emphasized that it is important that this feedback is structured. In this way, the employees get relevant and important information concerning the customer's preferences.

The participants' opinions about the *advantages* of the prototype are listed below:

- There is a need for this service. "We need a function like this!" was stated by one of the participants.
- This prototype is feasible. "This is the easiest to implement!"
- Easy to handle for customer support when registering feedback on a product level. Many have asked for a feedback function on a product level.
- The prototype will give a good indication on which groceries per store receive most complaints.
- The prototype makes the customer feel safe/safeguarded because they get the possibility to give feedback.
- Positive to give comments on product level in advance and to give feedback after delivery.
- Smooth experience for the customer. Easy to give feedback if the customer is not satisfied.
- Positive for AB Food that receives plenty of feedback from their customers

The participants' opinions about the *disadvantages* of the prototype are listed below:

- The prototype does not build much trust for the next order.
- It becomes more historical because one cannot improve the order.
- Requires a more streamlined feedback function, because discarded products must be registered as a loss for the local stores.

The participants' suggestions for *improvements:*

- Use this service for complaints related to the specific order, rather than using the comments for improving the next order.
- Enable the possibility to give overall feedback on the whole process, not just on product level.
    - Add more questions, e.g. related to delivery, packaging
- Make sure the feedback from the customers is returned back to the store and the employees.
    - Systematize and process comments from the customers so that the employees do not get too much irrelevant information

Summary of the results

The feedback from the group interview concerning the evaluation of prototype version 1 was helpful for further development and decision-making. Although the participants saw advantages and disadvantages with all three prototypes, they showed most interest for the *Stream* and *Preference Feedback* prototypes. The participants thought the *Tinder for Perishable Products* prototype would be complicated for the business and thought it could be used for special orders. This opinion reflects that the use of this service is more narrow. The participants considered the *Stream* prototype as being the most exciting and innovative, but their concern was that customers could perceive it as time-consuming. The overall feedback on *Preference Feedback* was that there is a need for this kind of service and that it is feasible.

5.4 Second iteration of prototypes

Based on the results from the group interview with AB Food concerning the evaluation of prototype version 1, we found that the participants preferred the *Stream* and *Preference Feedback* prototypes among the three prototypes presented in the previous section. Therefore, we decided to continue with the two prototypes the *Stream* and *Preference Feedback*. During the evaluation, we identified several areas of improvement. Due to limited resources and time

limitations, we decided to focus on a selection of the suggested improvements. These are addressed in the prototype version 2, which was evaluated through usability tests and interviews related to trust. The rest of this section describes the functionality of the prototype version 2 and presents the results of the evaluation.

The Stream version 2

The suggested improvements from the evaluation of prototype version 1 indicated that the participants preferred to give customers the option of choosing which groceries to review, instead of auto video recording all orders. One of the reasons was because of privacy in the sense that one should not record more data than needed. It would be better to record the shopping tour for only those who would be interested in seeing it. Therefore, we decided to change the video recording from being "always on" in the department of perishable products, into filming only on request from the customer. This idea came from the *Tinder for Perishable Products* prototype. Although the participants were critical to the Tinder prototype, they saw the value of letting the customer choose if and which groceries should be evaluated before delivery. As a result, we included checkboxes that gave users the possibility to choose which groceries the user would like to confirm before the delivery.

We decided to add product information such as name, quantity, weight, collected quantity and collected weight, and decided to gather this information in a box placed in the top right corner, on the opposite side of the comment field. This decision was also based on the feedback from the evaluation of prototype version 1 with AB Food. In the same way as Nepomuceno and colleagues (2014) state that more information about the product could reduce the risk of buying online, the participants thought more information in the prototype could reduce the perceived risk and give a confirmation that one gets the same products as ordered. The prototype can be downloaded here: https://goo.gl/MHRo8Y

Preference Feedback version 2

Based on the comments from the evaluation of prototype version 1 (see chapter 5.3.1), we concluded that the *Preference Feedback* prototype had more potential serving as a refund service, not just a general feedback channel. Therefore, we made some minor changes to the wording in the prototype. We also changed the last confirmation screen so it clearly stated that the customers would be reimbursed for their inconvenience. The evaluation also helped us thinking more holistically about the service. The suggestion that the service could ask the customers other types of questions concerning the delivery or packaging, made us extend the

prototype. In addition to giving feedback to products, we enabled the possibility to give feedback on delivery, packaging and the category called “other”. The prototype can be viewed here: https://invis.io/T5AISSDMW

5.4.1 Usability testing

Background

As mentioned in the previous section, we continued with two of the prototypes based on the evaluation with AB Food. The purpose of the usability test was to investigate how the basic functionality was perceived, and if it was easy to use and understand. Usability testing is carried out with the aim of figuring out if users find the interface usable by giving them tasks to perform while interacting with the system. This form of evaluating user interfaces can involve a collection of different data collection methods such as experiments, observation, interviews, and questionnaires. The users can be asked to think aloud (see chapter 3.3.5) in order to reveal their thoughts. The two main measurements for performance are time used and number of errors that participants make (Sharp et al., 2015).

We wanted to find out what the participants thought about the prototypes and whether or not they would use time on them. We also wanted to evaluate the prototypes to figure out if they increased perceived trust in the ability of the employee collecting the groceries. Therefore, we asked the participants to think aloud when solving tasks, and we combined the usability tests with interviews related to trust as described in chapter 5.4.2.

Planning and execution

AB Food helped us with the recruitment of customers. In total five customers participated. Four of them had at some point complained or given other feedback on groceries they had ordered. The usability tests were conducted at their offices in Oslo. The planning was similar to the interviews described in chapter 4.3.1 with regard to practical planning and recruitment. We made an evaluation plan (appendix H), which contained an overview of the agenda, manuscript, tasks and questions for the interview and discussion.

Before conducting usability testing with customers, we held a pilot test with one participant. Here we discovered that it was difficult to measure time used and the number of errors that was made in the *Preference Feedback* prototype. This was a consequence of testing the prototype on a mobile phone as the screen was too little to capture everything. Although the

advantage of using a mobile phone for the test was to give the solution a more realistic feeling, we decided to conduct the usability test of the *Preference Feedback* prototype on a desktop instead, as we would have the advantage of using screen recording of the session, which would make it easier to analyze afterward.

After the first pilot, we did a second pilot of the usability test, inspired by autobiographical design. Neustaedter and Sengers (2012) define this method as "design research drawing on extensive, genuine usage by those creating or building the system." (p. 514). This means that the researchers or designers use and test the solution they have created based on their own experience (Neustaedter and Sengers (2012). When we did the pilot test inspired by autobiographical design, we acted as participants. Due to limited time, we had the benefit of testing the solution on ourselves to see how it would work on the desktop instead of on a mobile phone.

The usability tests started with information about the project and some general questions about the customers' perception of the current online grocery store and employees. The participants were presented with scenarios that put them in the context of buying groceries online, followed by tasks related to the prototypes. While conducting tasks, we used equipment for recording the screen and sound. The customers were informed that we did the recordings. The consent forms that they signed, confirmed that the data collected from the usability tests would be kept anonymous and confidential. The customers were encouraged to reveal their thoughts by thinking out loud. With the use of think aloud (see chapter 3.3.5), we got the advantage of not only seeing what the participants did, but we also got insight into how they thought (Sharp et al., 2015). After the tasks were conducted, we asked questions related to trust. At the end of the session, we discussed advantages and disadvantages of the two prototypes. The participants were given a small reward in the form of a gift card provided by AB Food.

The Stream prototype

For the usability test of the *Stream* prototype, the participants were presented with the following scenario: "You are in the online store and place an order for groceries for the entire week." Then we presented a screenshot of the order page, and continued reading the scenario: *"*Here, you will get the possibility to review groceries, which means that you get to see the groceries before they are delivered to your home. You choose to review some of the

groceries. A little while after you have completed your order and the employee has collected your groceries, you get the following message on e-mail." After the scenario, we presented the e-mail and started the prototype.

When we presented the prototype, we gave the participants three tasks:

1. You are dissatisfied with a fruit (e.g. the banana) that has been collected. What do you do?
2. You are interested in seeing the avocado that has been collected. How do you do that?
3. Could you explain what you think would happen if you clicked on the different elements?

Preference Feedback prototype

For the usability test of the prototype *Preference Feedback*, the participants were given the following scenario: "When ordering groceries you get the possibility to leave a comment for each perishable grocery." Then we presented a screenshot of the order page. "After the groceries have been delivered you receive an SMS with a link." After the scenario, we presented the SMS and started the prototype.

When we presented the prototype, the participants were asked to conduct two tasks:

1. You are dissatisfied with the banana you received. What do you do?
2. Could you explain what you think would happen if you clicked on the different elements?

Analyzing the data

By using software for video recording of the screen, we could easily go back to the recordings and use them for analysis of the results from the usability tests. After the conduction of the usability tests, we documented the results. This was done by watching the video recordings and listening to the audio recordings. When going through the video recordings we measured the participants time used and errors made. We measured time used from the moment we gave the participant the task until the task was fulfilled by clicking on the "Ok" or "Send" button in the last screen. We used the time measurements from the second pilot, inspired by autobiographical design, as a benchmark when analyzing the results from the usability tests with the customers. The time used in the pilot represents an ideal time for solving the tasks. The reason being that as both researchers, designers, and testers we

knew the prototype and the required actions. In addition, we only gave short comments when thinking aloud. The time used in the pilot can give an indication of an ideal time but is not representative as a benchmark. This is because the prototypes do not open up for time-consuming actions such as writing complaints or taking pictures.

For the analysis of the data from the usability tests, we used descriptive statistical analysis. The audio recordings from the think aloud were transcribed, reviewed and analyzed. The participants' thoughts (*what they said*) were compared to how they solved the task (*what they did).* This comparison was also used when identifying errors that the participants made. By using comparison we considered the participant's actions against what the participant thought out loud. For instance, in one of the cases a participant thinks aloud: "Then I type: "please get greener bananas", and send [to complain]", but clicks on the x-button and closes the form. By clicking on the x-icon instead of send, which she commented that she would, she closes the form without sending the message. Therefore, we have defined this as an error. In other cases, such as when the participant says, "Well, could I click here?" followed by clicking on the corresponding icon, the thinking aloud is in accordance with the action. The way the number of errors was counted was based on our definition of the ideal course of sequence for each task. However, as there were several ways to solve and understand the tasks, we considered each task individually. If the action was in accordance or similar to the course of events, we did not consider it as an error. If it was outside of the course of events or did not lead to the desired outcome, it was considered as an error. In some cases, the participant did not continue the task without guidance, leaving comments such as "I have no idea. Where do I click now?" We decided that if a task had not been fulfilled, we would count it as an error.

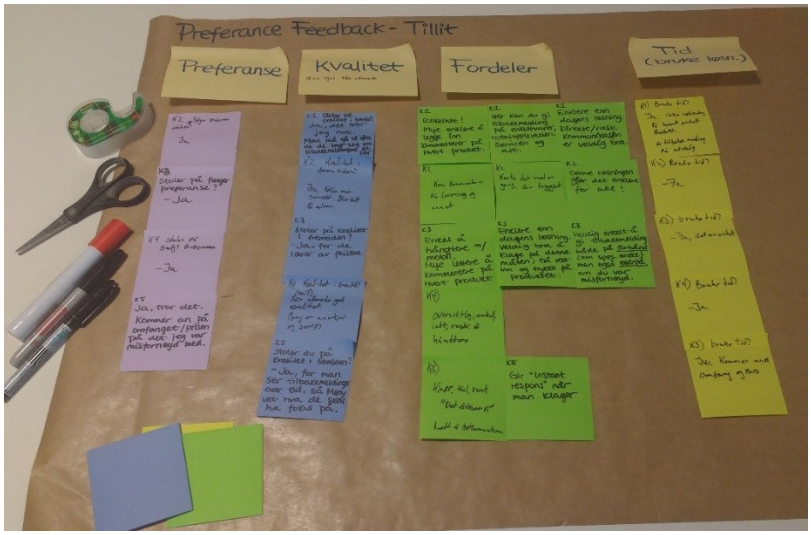

Figure 20 Thematic data analysis

When analyzing the responses from interviews conducted as part of the the usability test, we used thematic analysis as described in chapter 3.5.1. The predefined thematic categories we used were: *advantages, disadvantages,* and *improvements*.

Results

The Stream

When going through the *first task* asking the participants what to do if they were dissatisfied with a grocery that had been collected, some of them experienced confusion in the process of solving it. Here, two of the participants made two mistakes each. One of them tried to click on the preferred banana in the video and drag it over in the shopping cart. This participant needed guidance to find the comment field or discard function. The other participant immediately thought she would have to make a phone call if she was not satisfied with a grocery. This participant also needed some guidance. We, therefore, asked if there was something she could do in the solution. The question helped her finding and clicking on the comment field. While she thinks loud that she would click on send, she instead clicks on the x-button and does not fulfill the task. One of the participants that did not make any errors and solved the task using the trash icon to discard the grocery, thought she had to wait until the vegetable appeared in the video and click on the trash icon just in time before it disappeared. The average time to solve the first task was 38 seconds and the fastest participant solved the task in 25 seconds. In our pilot test, we used 18 seconds to solve this task, which is significantly faster the average time used by the participants.

All of the participants solved the *second task* without making any errors. They understood how they could use the icons in the menu to navigate to the desired product in the video. The task was also solved quickly with an average of 11 seconds, with the fastest participant solving the task in 8 seconds. In our pilot test, we used 10 seconds to solve this task, which is close to the average time used by the participants.

For the *third task*, where the participants explained what they thought the different elements represented, the majority of the participants (4 of 5) solved the task without any difficulties. The one error that was made was by a customer who thought that by clicking on the trash icon, the grocery order would be deleted and she would have to order the grocery again. We have not measured the time used for this task because there were differences in how much time the participants used on explaining the different elements. In addition, they did not

necessarily explain the same elements. If a participant had already commented on a function during the other two tasks, we would not ask for the same function in this task. Therefore, we do not consider this task as comparable or measurable.

The participants' opinions about the *advantages* of the prototype are listed below, with the numbers in parentheses representing the number of participants:

- One get to *see* the products (3)
- Good service for those who are especially interested (4).
    - Both those who are positive to the service and those who are more critical to it share this view. "This is a good solution for those who are especially interested like me!"
- Verification of the thorough work of the employees (2)
- Enables more communication between the employee and the customer
- Gives a feeling of being present on the shopping tour
- Builds credibility
- The service contributes to control (2)

The participants' opinions about the *disadvantages* of the prototype are listed below:

- Time-consuming to use (4)
- The prototype does not give the possibility to look closer at the groceries more carefully, and it is not obvious why the employee chooses the particular groceries (2)
- The prototype is perceived as being messy
- Narrow target group. Only customers that are especially interested will use the service (3). Among both the participants who would spend time on using the service and those who would not use it so often, three were unsure if others would spend time on the service

The participants' suggestions for *improvements:*

- Present the name of the employee. (3) "One could add information to give a feeling of security. One could do it by presenting the particular employee, or one could mention what demands are expected from the employee."
- Add a zoom function to enlarge the groceries

- Improve the placement or appearance of some of the elements in the prototype. Several of the participants did not comment on or use elements in the prototype, such as the information box or the comment field.
    - One of the participants suggested moving parts of the information, such as the quantity of the groceries, closer to the menu on the right side.
    - Another participant suggested placing the comment field closer to the discard function, or to have the information appear together with a signal, e.g. a pling or blink
    - One of the participants thought is was misleading to have both a comment- and a discard function. This participant used the comment function to tell about a grocery she was dissatisfied with. When she found out she could use the discard function she commented: “Maybe it is a bit misleading to have both the trashcan and the comment field.”
- Edit the video in a way that the groceries are presented after each other. Cut all the walking in between. The goal is to make it more efficient to use the service
- Extend the solution into being a virtual shopping space, to make it possible to click directly on products in the video and shop on impulse

Preference Feedback

The first task took the user through the whole sequence of complaining. None of the participants made any errors on the first task. The average time used for solving the task was 1 minute and 50 seconds, and the fastest time for solving it was 60 seconds. In our pilot test, we used 31 seconds to solve this task, which is significantly faster the average time used by the participants. Because all of the participants solved the first task without any errors, we assumed that they understood the service and found it easy to use. Therefore, we did not ask them to solve the second task, which was to explain the different elements. Based on the results from the previous task, we assumed that the functions were understandable.

Many of the participants spent time on giving comments by thinking aloud, so in the context of the task, the average time is a bit long. This may be a consequence of the encouragement of thinking aloud. Even though the think aloud may have extended the time the participants used on the first task, we argue that the time used during the usability test may be comparable to a real setting. If this were a real situation, the participants would probably use more time to write a complaint. The participants who chose to add an image would probably use more time

in a real situation because in the prototype the image was already taken and the user could rapidly upload it.

The participants' opinions about the *advantages* of the prototype are listed below, with the numbers in parentheses representing the number of participants:

- Easy to use (4)
- Easier to use than today's service of giving feedback on the order (2)
- Efficient to use (3)
- Beneficial to comment each grocery in advance of the delivery (2)
- Instant response or communication (2)
- Possibility to comment on more than only the groceries; delivery or service, etc. (2)
- Mobile-friendly
- Enables giving complaints immediately after delivery

Four of five participants did not see any *disadvantages* with the service. However, one of the participants that claimed to not see any disadvantages commented earlier in the session that the service could be perceived as a complicated add-on that could be time-consuming to use. She, therefore, highlighted that the service had to be voluntary. The one participant that did see disadvantages had the following opinions:

- Because the service is offered after the groceries have been delivered, one cannot feel 100% safe that one receives products following own preferences
- The service can be exploited if the system gives automatic response to the feedback from the user

The participants' suggestions for *improvements*:

- Rephrase the question on the front page of the user interface from "Were you satisfied with the delivery?" to "Was there anything you were dissatisfied with?" or "What do you want to give feedback to?" This suggestion was made because the customer did not want to answer that she was dissatisfied with the overall delivery if it was only a small thing she was not satisfied with.
- When the customer has sent the feedback, the last screen could give an apology for the inconvenience.
- Ask if the customer was satisfied with the employee by using his or her name. "Are you satisfied with x [name of the employee] who collected the groceries?"

- Combine this service with the *Stream* service.

Summary of the results

Based on the usability test, we conclude that most of the participants perceive the *Stream* prototype as a demanding and time-consuming service. The service is considered to have a narrow target group interested in taking the time to go through the shopping tour, controlling the groceries. Further, it has the potential of preventing refunds and complaints, by enabling customers with the possibility of giving feedback on groceries collected, before the delivery is shipped out. This gives the customer safety that the employee will select groceries of their preferences. Thereby, reducing the likelihood that there will be something wrong with the groceries (product risk).

In general, the participants perceive the *Preference Feedback* prototype as a less demanding service. It is considered to have a broader target group among those who want online shopping to be fast and efficient at every stage of the delivery process, including feedback and complaints. The service provides greater ability to get delivery tailored to customer preference, but will not prevent refunds and complaints. However, it will make it faster and easier to provide feedback and obtain a refund.

The suggestions on improvements for the two prototypes are listed in the table below.

#	**The Stream**	**Preference Feedback**
1	Present the name of the employee	Rephrase the question on the front page
2	Add a zoom function to enlarge the groceries	The last screen could give an apology for the inconvenience
3	Improve the placement or appearance of some of the elements in the prototype	Ask if the customer was satisfied with the employee who collected the groceries
4	Edit the video in a way that the groceries are presented after each other	Combine this service with the *Stream* service

5	Extend the service into being a virtual shopping space	

Table 9 Suggestions on improvements from usability test of prototype version 2

5.4.2 Evaluation of trust

In this section, we will present the interviews related evaluation of trust, which was part of the usability test. Most of the practical considerations have already been described in chapter 5.4.1.

Background

We wanted to explore customers' perceptions of trust in the two prototypes the *Stream* and *Preference Feedback*, as a way of getting closer to answer our research question. We also wanted to investigate customers' current trust in the employee's ability to collect groceries.

Planning and Execution

As in the evaluation with AB Food, we based the questions for the evaluation of trust on Lu et al. (2010) and Gefen et al.'s (2003) trust antecedents. The questions were a mix of open-ended and closed questions with the possibility to add follow-up questions if necessary. The interviews were conducted before and after the usability sessions took place, so that the participants still had the solution fresh in mind. The responses were recorded and noted for further analysis.

Analyzing the data

We have analyzed the data from the interviews related to trust by using simple thematic analysis with a deductive approach, on a semantic level, as described in chapter 3.5.1.

When analyzing responses related to evaluation on the trust of the *Stream* prototype the predefined themes were: *knowledge, competence, preference, quality,* and *time.* We used fewer categories when analyzing the *Preference Feedback* prototype. This was due to some questions about knowledge and competence were asked only once. The themes for analyzing *Preference Feedback* were *preference, quality*, and *time*.

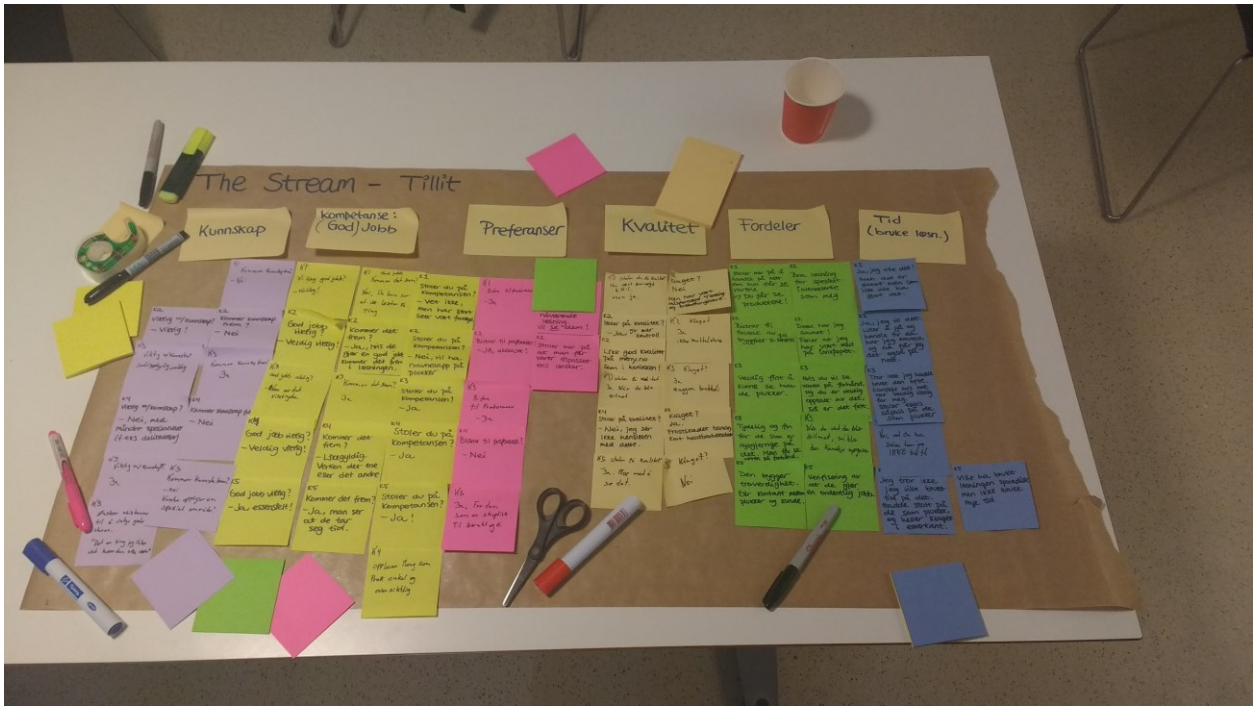

Figure 21 Sorting the answers in different themes

Results

Current trust

When evaluating customers' current trust in AB Food's online grocery store, the results showed that all five participants believed it was important that the employees did a *good job* while collecting groceries. This was clear from the participants' answers. Three of them believed it is very important, one stated that it is essential the employees do a good job because they do not get many chances and the last answered: "It's among the most important."

Three trusted that the employees currently have the *competence* to do a good job. One did not know but was satisfied with the job done. The last participant did not trust the competence of the employees with the reasoning that the employees do not need to have any special competence doing the job unless they collect special groceries like delicacies. One participant said:

> *"*No.[...]. There is a difference between selecting from the shelves and choosing at the meat and cheese counter when you're looking for a particular delicacy. That requires certain competencies. Otherwise, all they do is choose among guidelines that are provided for them. That doesn't require a lot of competencies.*"*

The majority of the participants (four of five) thought it was important, very important or essential that the employees had *good knowledge* about the groceries, while the last one did not answer this question.

The Stream prototype and trust

One of the participants thought that the prototype showed that the employee had *good knowledge* about the products, while the remaining four did not think so. Three of the four participants that answered no to the question suggested that one could add the name of the employee in the prototype, while the last participant believed it was not easy to see why the employee chose the one avocado over the other.

On the question, if the participants thought the prototype shows that the employee does a *good job (competence)*, three participants answered yes, one answered no while one answered indifferently. One of the participants who answered yes commented that one sees that the employee takes the time. The participant who answered no did not think it was easy to see from the prototype that the employee did a good job. "Because you only see that they go and pick something up. You see that they look at it and that it looks good and they put it in the cart, so that's okay. But anything more is not so easy to read out of this I think."

Four participants believed the prototype would help them get groceries of their *preferences*. One of them stated "Yes! Absolutely! I tend to forget things, so maybe I'll remember it on this shopping tour." Another participant did also think so: "Yes, I do think so. For those who are very skeptical to fruits and vegetables. It depends on how one handles it afterward." The fifth participant did not think the prototype would contribute to receiving groceries of her preference. This participant was skeptical to the prototype in general and did not give related reasoning to her answers on the questions.

On the question, if participants thought the prototype would make them trust that they would receive groceries of better *quality*, most of the participants (four of five) answered yes and one answered no. The participants who answered yes gave different reasons; one get to see the groceries in advance, the employee knows he is being filmed and the prototype gives more control. One participant said: "Yes. Because I am present. I have more or less full control." The participant that answered no did not see the purpose of the service and looked at it as a pastime.

Four of the participants would *spend time* on giving feedback with this service. Looking at the numbers isolated one could think that there was a common opinion that the service would be used, but when carefully going through the comments from the participants one notices that two of the participants were skeptical to how much they would use it. One of the participants that answered she would not use it very often said that she would probably use it for special occasions: "I do not think I would use it that often. Maybe if it was something that was very important for me. Otherwise, I trust the employee." The other one answered that he would rather have complained afterward. The latter would not have spent much time on it but would have used it occasionally. Among both those who would have spent time on the service and those who would not have used it very often, four were unsure whether others would spend time on the service.

Preference Feedback prototype and trust

On the question, if the participants thought the prototype would make them trust that they would receive groceries of better *quality* in the future, the majority (four of five) answered yes. Two of the participants that thought the solution would contribute to groceries of better quality in the future, believed AB Food would learn from the feedback the participants gave in the service. One participant said "One must assume that they care about the feedback they receive when they ask for it in this way. And to the extent one gives feedback that things are not so good, I trust that they want to fix it". Another participant that also answered yes gave this reasoning and said "Yes, it feels more professional. The customer is taken seriously." The one who answered no already thought she received high-quality products: "Better quality? I feel I already get good quality from AB Food. And here everything is arranged so that one gets money back if one is not satisfied with the groceries. So it is a professional and recognized store."

All five participants were willing to *spend time* using the service, but two of them answered that the use depended on the extent, price or importance of the complaint. One participant said "Yes, I think so. It depends on the extent or the price of the item I was dissatisfied with. I believe I would have done it because it is so easy to document." The other participants were sure they would spend time on it: "Yes, absolutely. If I am dissatisfied with something, this is a very easy way of complaining. [...]." One of the participants thought it was important to spend time using the solution: "Yes. It's important, because [the service makes] you feel safe when you are not satisfied. Otherwise, you think damn, I'll go to the store myself".

When asked if the service would help to get products according to the participant's *preferences* three answered yes. One participant gave an answer that indicated he did not think the service would help to receive products of own preference: "It rather makes me feel I am confident that I will receive the reimbursement of the delivery." Another participant did not answer the question.

5.5 Summary

In this chapter, we have presented the activities and studies we have conducted in the develop phase; creation of prototype version 1, group interview with stakeholders, creation of prototype version 2 and usability test with users.

Below is an overview of all empirical studies and main findings presented in this chapter.

Study	**Prototype**	**Number and background of participants**	**Main Findings**
Group interview with AB Food	The *Stream*	5 stakeholders consisting of executive and non-executive employees and designer	Innovative! Narrow target group. Time-consuming to use.
	Tinder for Perishable Products		Requires 360 views to give a pleasing result. Not feasible.
	Preference Feedback		There is a need for this solution.
Usability test with users	The *Stream*	5 customers	Narrow target group and time-consuming to use. Some errors made and somewhat confusing to use.
	Preference Feedback		Easy to use. Few disadvantages.

Interview on trust with users	The *Stream*		The solution can help in getting groceries of customers' preferences. Seeing the products can build trust.
	Preference Feedback		The solution can help in getting groceries of good quality and in accordance to customer's' preference.
Total		**10**	

Table 10 Summary of main findings from the studies conducted in the develop phase

We created the first prototypes based on the recurring themes from the studies we conducted in the discover and define phases. To address product risk caused by the issue of customers' receiving products that do not meet their expectations, we made three prototypes: The *Stream*, *Tinder for Perishable Products* and *Preference Feedback.* The goal was to find out if the prototypes could increase customers' perception of employees' ability to select groceries.

The first prototypes were evaluated through the conduction of a group interview with stakeholders because we wanted opinions from the business perspective. The stakeholders found the *Stream* prototype as being the most innovative and exciting. The solution made the products and the process of collecting more visible., due to the video recording. The service could put pressure on the employee to maintain a good job, while also building trust with the customer who sees the groceries and collection process. However, the *Stream* was considered as being time-consuming and having a narrow target group. In general, the stakeholders did not find *Tinder for Perishable Products* feasible. The main reason was that one could only view the products from one angle, and taking 360 pictures of the products would require much effort. The stakeholders thought *Preference Feedback* would be useful for the company when handling complaints. They pointed out that it would be important that the feedback was

handed from customer support to the employees working in the respective stores. In this way, the employees could learn about customers' preferences.

In the second iteration of the prototypes, we continued with the *Stream* and *Preference Feedback.* The prototypes were evaluated through usability tests with customers, followed by interviews related to trust. The usability test showed that the *Stream* was believed to have a narrow target group and that it was time-consuming to use. For *Preference Feedback* the usability test showed that the customers found it efficient and easier to use than AB Food's existing solution. In general, they saw few disadvantages.

In the interviews related to trust, the majority of the customers believed the *Stream* prototype would help in receiving products of better quality, in accordance with their preferences. The majority would spend time on the prototype to different degrees, although some of them were unsure if others would use time on it. The participants believed the *Preference Feedback* prototype would help in receiving products of better quality, following their own preferences. All participants would spend time on the prototype, and had mainly positive feedback to it. Positive sides of the prototype were that it offered efficient communication and safety in situations where customers were not satisfied with the groceries.

6. Discussion

The main objective of this master thesis was to increase understanding of customers' trust in buying perishable products online. Through concepts and prototypes, we explored different ways of using feedback such as ratings, comments, and various forms of presence. We explored ways to increase customers' perceptions of the ability of the person collecting groceries for their orders as a way to build trust.

In this chapter, we discuss and reflect on our findings related to trust in the context of online grocery shopping. We also reflect on lessons learned concerning the approaches and methods we have used. In section 6.1, we discuss the main findings related to the topics of trust and perceived ability of the employees selecting groceries for online orders. The findings are summarized and explained through the presentation of our model, inspired by Mayer et al.'s (1995) model. At the end of section 6.1, we present the validity of our data collection, selection of participants, and data analysis. Section 6.2 presents the design implications we have made based on our findings. In section 6.3, we reflect on the approaches and methods we have used. The reflection is concerned with our experiences with technology research and service design, and our combination of these two approaches. In addition, we discuss the benefits of using the future workshop method. Throughout the section, we share our lessons learned. In the last section of this chapter, we present some ethical precautions taken in this research project.

6.1 Trust

In chapter 4, we discussed the development of the concepts *Cartpooling*, *Elderly Service* and *Housing Cooperative*. In the development of the concepts, we found elements of social risk and product risk, which lead to the development of the *Stream*, *Tinder for Perishable Products*, and *Preference Feedback* prototypes. Prototype development and feedback utilization were covered in chapter 5. In this section, we reflect on the main findings from the design and evaluation activities.

Social risk

During the interviews evaluating *Cartpooling*, we found elements of social risk. The participants did not like rating their neighbours, and they felt like they were intruding on or

bothering others when asking for shopping favours. In addition, they felt that their privacy was exposed. These issues were confirmed in the future workshop and proposed solved in the *Housing Cooperative* by using a dedicated person to collect groceries. The results from both the focus groups and the questionnaire showed that the perceived social risk was lowered when using a dedicated person. Results also showed that there was a higher social risk associated with the neighbour. It was suggested that there was no need for the person collecting groceries to be dedicated as long as customers' preferences and needs were properly documented. Without a dedicated person, the service would be similar to AB Food's existing online grocery store. The *Housing Cooperative* solution was therefore modified and extended. The need for documentation of customers' preferences was used as inspiration for the *Stream*, *Tinder for Perishable Products,* and *Preference Feedback* prototypes.

Product risk

In addition to elements of social risk, we found during interviews that there was product risk associated with both *Cartpooling* and AB Food's current online grocery store. This finding was confirmed in the future workshop. Participants considered buying groceries online risky because of the differences in their preferences. Our findings confirm the studies of Huang and Oppewal (2006). They found that customers may risk receiving products that do not meet their expectations because they have different preferences than the person selecting their groceries. The results from the focus groups and the questionnaire showed that the choice of actor for the collection of groceries had little effect on the perceived product risk. We tried to increase the willingness to take the risk (trust), by increasing the perceived ability of the grocery collector, inspired by Mayer et al.'s (1995) model and definition. We attempted to increase perceived ability by providing the employee with feedback related to customers' preferences. The perceived ability displayed the employee's knowledge, competence, and skill. When evaluating trust in the *Stream* and *Preference Feedback* prototypes, we found that product risk was reduced and that the willingness to take product risk was increased. We believe this is due to change in the customers' perceptions of the employee's ability.

Feedback

The use of feedback has been present in all of the different ideas and prototypes we have worked with. Throughout the project, we have tested different forms of giving feedback. The form of feedback we started with was rating. The goal of using rating was to increase the perceived ability of the person collecting the groceries, which in the *Cartpooling* service was

a neighbour. The idea was that mutual ratings could increase trust between neighbours using *Cartpooling*. However, ratings are typically either extremely high or extremely low (Abulaish, Jahiruddin, & Doja, 2009, in Kang & Park, 2014, p. 1041). The reason for this might be that consumers typically want to reward excellent service or call out exceptionally bad service (Blumenthal, 2015). This bimodal distribution does not provide helpful information regarding customer satisfaction (Abulaish, Jahiruddin, & Doja, 2009, in Kang & Park, 2014, p. 1041). Reviews, unlike ratings, have been recognized as a valuable information source for monitoring and enhancing customer satisfaction (Kang & Park, 2014) because reviews reveal both positive and negative aspects of a service (Zhang, Narayanan, & Choudhary, 2010 in Kang & Park, 2014, p. 1041).

Customers' unwillingness to rate their neighbours or others they have a relationship with might also be found in other situations where rating is used to measure customer satisfaction, for example, when customers are asked to evaluate staff they had contact with, delivery they received, or a meal they ate. Because of the discomfort and social risk associated with ratings, and the fact that ratings provide little useful information, we moved away from this form of feedback. Instead, we decided to let users provide feedback in the form of comments. We believe other service providers can learn from this, by considering what type of feedback they request and how frequently they request it. Feedback provided by customers, in the form of comments, may increase employees' abilities to select groceries. We believe that this kind of feedback helps provide knowledge about customer preferences. However, we have not measured the increase of ability, because ability is built over a longer period, and we have only tested the solution once.

We suggest that feedback can work as a safeguard or structural assurance related to Institution-based trust (see Chapter 2.1). The feeling of being present in the grocery store, combined with the opportunity to give feedback about selected groceries in the *Stream* can give customers safety and assurance. In *Preference Feedback,* customers felt safe because they could provide feedback and receive a refund if they were not satisfied with the delivered groceries. If refund does not make the customer feel safe, we argue that we still have managed to fill a need. The reason is that participants would use the solutions, as they believed *Preference Feedback* would increase the quality of the groceries, in accordance with the customers' preferences.

Perceived ability

Feedback in the form of comments was suggested to increase the perceived ability of the employee collecting the groceries. Participants argued that comments, containing customers' preferences, could be used when an employee selected groceries so that the selection of groceries would be customized according to customers' preferences. Each customer would have a history or log with stored comments. Employees would use the history or logs to select groceries following customers' preferences. It was further believed that the feedback in the log could lead customers to increase their perception of the employee's ability.

In hindsight, we see that we tried to solve some of the ability issues presented by D. Kim and Benbasat (2003), such as low-quality products, insufficient after-sales support (cancel/refund), and lack of information. To solve the issues, D. Kim and Benbasat (2003), proposed product warranties and information about the quality control processes. We believe that the *Stream* improves the quality of the products and provides information about the quality control processes, by enabling customers to watch recordings of employees selecting groceries in the store. *Preference Feedback* improves the quality of products and offers after-sales support in the form of an easy way to get refunds.

6.1.1 Reflections about the prototypes

The Stream

The results from the usability test showed that customers trusted that employees had the required competence to collect groceries. One reason was that customers could see that employees took the time to study the groceries before selecting them. Another reason was that employees would make an effort to do a good job if they knew they were being filmed. This shows that the service is transparent, and can help increase customers' perception of the employees' abilities to select groceries. However, it is unclear to what extent the service affected the perception of employees' ability to do a good job when selecting groceries.

Because the participants already trusted the ability of the employee selecting their groceries, we cannot know with certainty whether they trusted the employee's ability because they already trusted the employee, or whether it was the *Stream* that contributed to the trust. It may also be that both of the factors had an impact. Further, the results indicated that we did not manage to make the knowledge of the employee visible in the *Stream* prototype.

Therefore, we cannot claim that the perceived ability was increased, and it is unclear whether these factors had an influence on trust.

We claim that the service may have reduced product risk, based on the customers' trust in the service giving them groceries of better quality. We suggest that this is due to the increased possibility of giving feedback. By enabling customers to give feedback before groceries are delivered, employees have the chance to select groceries of customers' preferences. We believe this will reduce the risk of receiving products that do not meet customers' expectations. It is, therefore, cause to suggest that feedback increases employees' knowledge about customers' preferences. This, in turn, can increase customers' perception of employees' abilities, even if this relation was not visible in the presented prototype.

Preference Feedback

The idea behind the *Preference Feedback* prototype was that feedback received from customers after the delivery of groceries could be used for learning. The belief that the service would result in customers receiving groceries of better quality was related to their provided feedback. Some of the participants thought AB Food would learn from the feedback, and this would result in groceries of better quality in the future, in accordance with participants' preferences. This indicates that customers had the perception that employees' abilities to select groceries would increase with the use of *Preference Feedback.* Because learning and increased ability happen over time, results can only indicate if the service can increase trust.

6.1.2 Summary

To summarize our findings we have created a model. The model is an extension of Mayer et al.'s integrative model of organizational trust (1995). The gray rectangles are from Mayer et al.'s model, the white rectangles are the themes specifically related to our research and the white ellipses are our findings. The model is intended as a supplementary explanation of our findings. We have discussed the specific findings in detail below.

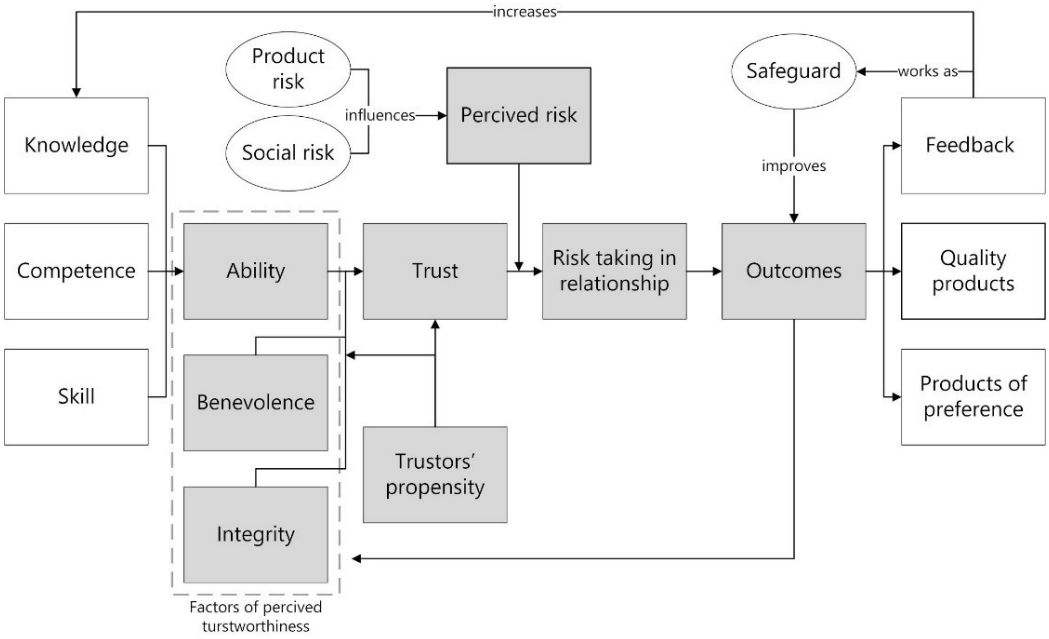

Figure 22 Our model explains the main findings

The model (figure 22), explains that knowledge, competence, and skill contribute to increase perceived ability (Gefen et al., 2003; Lu et al., 2010). Ability is one of three factors of trustworthiness that contributes to trust (Mayer et al., 1995). When entering the trust and risk-taking relationship (i.e. using our proposed services), we found that the trustor (i.e. the customer) perceived product risk and, with some services, social risk. The findings of product risk are in line with previous research (e.g. Bhatnagar et al., 2000; Nepomuceno et al., 2014). Product risk and social risk are among the seven types of risks identified by Jacoby and Kaplan (1972). After the trust relationship and risk-taking is over (i.e. the groceries are delivered) the trustor evaluates the outcome (Mayer et al., 1995). In our case, the outcome is the delivered groceries, and the evaluation is based on customers' preferences and expectations regarding quality. We consider the feedback given by customers to be part of the outcome. If the outcome is evaluated as successful, the trustors' perception of trustees' trustworthiness is increased (Mayer et al., 1995). In our context, this means that if customers receive products according to their preferences and of expected quality, the customers' perception of the employee's ability will be increased.

The model also presents our finding that feedback provided by the trustor can be used as a safeguard improving or guaranteeing the outcome of the risk-taking relationship. The safeguard is a structural assurance, which builds institution-based trust, increasing the trustee's trustworthiness (Gefen et al., 2003; Lu et al., 2010). In our case, the feedback

provided by customers can ensure they receive a refund or provide valuable information about their preferences. In line with our findings, the model suggests a relationship between feedback and increased knowledge over time. The knowledge increases the ability of the trustee (Lu et al., 2010). The ability increases the trustworthiness that contributes to trust (Mayer et al., 1995).

6.1.3 Validity

As discussed in chapter 3.6, there are different approaches to demonstrate the validity and reliability of a study. For quantitative, positivist researchers, validity is presented through statistical data and includes demonstrating reliability, conclusion validity, internal validity, construct validity, and external validity. Qualitative, interpretative researchers acknowledge that their studies are not truly replicable, and focus on less formal ways of demonstrating reliability and validity (Angrosino & Flick, 2007). As we have chosen a pragmatic approach to this study, we can choose from both approaches. We will demonstrate validity in accordance with the positivist approach, although many of our arguments are based on the interpretative approach.

Reliability

To demonstrate reliability, researchers show that their methods (such as survey questions) and processes (such as statistical tests) can be used by others to obtain the same, or similar results. Because we have mainly used qualitative data, we are aware of the fact that other researchers trying to conduct the same studies as us, may end up with other findings. However, we have used conventional means for achieving reliability when collecting data, selecting participants, and analyzing data.

We have used a wide variety of data collection methods. In total, we have conducted seven different studies with 36 participants. The multiple sources of evidence have helped us look at the data from different perspectives, and they have been used for decision making and judging whether our findings are reliable. This is similar to the use of data source triangulation. Mason (2002) emphasizes that one should not expect that the different methods will produce the same sort of data. This means that when we got the same or similar results (i.e., feedback from participants) in the different studies, we can be more confident that our findings are reliable. According to Mason, it is important to be aware of how one's methods can underpin each other. She elaborates, "this will involve asking whether the two sets of

data tell you about the same phenomena, or whether the two methods yield comparable data. Often they do not, and you cannot therefore expect straightforward corroboration" (p. 33). Many of the methods and tools used in this study (e.g., semi-structured interviews and observation) require practice and experience. We have some practice with data collection methods from previous projects, but we are not experienced researchers. As inexperienced researchers, we might have had expectations regarding the results, called researcher expectancies, which consciously or unconsciously biased the results of our study. The more experienced the researchers are the more reliable and valid the results will be (Lazar et al., 2010; Shadish et al., 2002; Trochim, 2006). We acknowledge that more experienced researchers would likely get results that are more reliable than ours.

We realize it is important to be careful with formulations and wordings in oral settings, such as in interviews or usability testing. On the one hand, it is important to give the same explanations to all participants. By having an agenda and manuscript for all activities (e.g., interviews, focus groups) we tried to make the explanations to the different participants as similar as possible. On the other hand, we acknowledge that it is not possible to recreate the exact same wording when conducting activities such as interviews. We sometimes needed to make adjustments to the explanations. For instance, after conducting the first interview with one of the customers, we decided to change the order of some of the questions and rephrase one of the explanations. One could argue that this would result in incomparable data, but we claim that these changes were necessary to make the presented questions and concepts clearer for the customers in the following interviews. We also found the flexibility of the semi-structured interviews more valuable than gaining comparable data.

Conclusion validity

When analyzing data we need to ensure that the conclusions we reach about the association between treatment and outcome are reasonable (see chapter 3.6). Even if we try to be objective when recording data, we are continually making decisions on what to include in our notes, based on what we have observed, heard or experienced, and what we think the meaning of the data is. It is, therefore, important that researchers' records are detailed so that they give grounds for the decisions made (Mason, 2002). For this reason, Angrosino and Flick (2007) claim that data analysis is an integral part of the data collection process. While observing one tries to see things in new ways, but one filters and interprets what one sees and hears based on one's experiences. The goal of the observation should be to see things in a

new way. Therefore, it is advisable to make a clear distinction between observing and interpreting. Recording observations without interpreting them give a smaller chance of misinterpreting the data. We, therefore, tried to take notes of what was happening without attributing meaning to them. Despite our efforts to record our observations objectively, we acknowledge that our experiences and filtering of what we found interesting, may have affected the results. Mason questions whether researchers' memories are accurate or perceptions are valid. This is something we kept in mind. We tried to make systematic notes, and the notes were taken during or as soon as possible after conducting the studies.

We tried to compensate for the issue that we did not have much experience as researchers by being two people conducting the different studies (e.g. interviews, workshop, focus groups, etc.). Having multiple researchers conducting observation reduces the impact of individual biases, and if the same conclusions are drawn the confidence in the results is increased (Lazar et al., 2010). We tried to increase the validity of the analysis by implementing verification strategies and becoming familiarized with the data. The verification strategies we used were a *relationship between data and analysis* and *sampling sufficiency,* as described in chapter 4.3.

Internal validity

To demonstrate internal validity it is important to avoid external factors that may influence the researcher's results. When we studied and evaluated the prototypes in the group interview with stakeholders and in the usability tests with customers, we wanted participants' honest feedback. We told them we were testing the solutions, not them as participants, and encouraged them to reveal their thoughts by thinking aloud. Like Jakob Nielsen (1992), we support the use of think aloud, because it reveals participants' thoughts. However, Jakob Nielsen believes the main disadvantage of think aloud is that the time used is not representative of the actual use. We also experienced that participants sometimes used more time because of having to verbalize their thoughts. This could have affected the results. However, we found the participants' thoughts more valuable than accurate time measurements.

Presenting the prototypes as our own could have made the participants less willing to give their honest opinions, especially if critical. We did not feel this affected the results as we did receive some critical feedback. However, the participants may have communicated their feedback in a milder way than they would have done if they did not know who had made the prototypes.

During the usability tests, we wanted the participants to solve tasks by themselves, without too much involvement from us, because we did not want to affect the results. If the participants were unable to move forward or had questions, we would help. In this way, the participants got different degrees of assistance, which varied based on participants' backgrounds and needs. We experienced that it could be challenging to find a balance between not helping at all and helping too much, and we saw that in some cases we could have given less help. For instance, we did not know whether participants that did not comment on some of the elements, such as the comment field, did not notice them or just did not think aloud. In those cases, we guided the participants to use the comment function, but ideally, we could have waited longer.

We realize that the order in which the prototypes were presented could have had an impact on the results. It is natural that participants use previously shown prototypes for comparison. However, with the first prototype, the participants are not yet presented with other solutions. If we had randomized the order, it could have given us results that are more valid. However, we wanted the data to be structured in the same way for the purpose of analysis. Another factor that might have influenced the results is that the trustor's propensity varies depending on the participant's experience, background, and other factors (Mayer et al., 1995).

Construct validity

When taking measures, researchers should ask whether what they measured is in fact what they wanted to measure. In our research, we have only measured the first impressions of trust. Because trust and ability develop over time, we have presented our findings as suggestions and indications. To confirm our findings there is a need for a longitudinal study. We acknowledge that it would not be possible to study trust without also studying risk. "One does not need to risk anything in order to trust; however, one must take a risk in order to engage in trusting action" (Mayer et. al, 1995, p 724). To enter a risk-taking relationship, the level of trust must be higher than the threshold of perceived risk (Mayer et. al, 1995). We, therefore, believe it is important to consider the validity of the measurements, and explore whether we have measured risk or whether we have measured trust.

The trustor enters a relationship with an assessment of a positive outcome. There are two factors influencing this assessment: the relationship with the trustee (i.e., trust) and uncertainty factors outside the relationship (i.e. perceived risk). Perceived risk involves the trustor's beliefs about the likelihood of gain or loss, which does not involve the trustee. "In

sum, to understand how trust actually affects a person's taking a risk, one must separate trust from other situational factors that *necessitate* trust (i.e., perceived risk […])" (Mayer et. al, 1995, p. 726).

Many of the questions we asked during the interviews were related to the outcome of risk-taking relationships. One example is the interviewees' assessment of the likelihood of a positive or negative outcome, based on their imagined use of a service or prototype. We also asked whether interviewees would use the services and what issues and risks they perceive. Based on feedback from our pilot studies we reduced the precision of some of the questions in order to make them easier to understand for the participants. Changing the questions could have caused that we have not defined the measures of trust and risk precisely. It is, therefore, difficult to know whether the expected positive outcome is due to reduced perceived risk (assessment of risk) or increased trustworthiness. The imprecise measurement is what Shadish et al. (2002) refer to as inadequate preoperational explication of constructs. We argue that the outcome of the risk-taking relationship is strongly connected to the trustees' abilities to select the best groceries. In this way, ability can be considered to influence perceived risk. We believe the strong ties between ability and a positive outcome is related to the relationship with the trustee and should be considered a part of the trust. We, therefore, argue that we have measured trust. This assumption makes it easier to connect our findings to Mayer et al.'s (1995) integrative model of organizational trust.

We have developed and tested multiple prototypes which have given us similar results. The development of multiple prototypes has increased the chances that we have captured the way in which feedback influences trust, and not only the way in which the prototypes influences trust (Trochim, 2006). Hence, we have avoided the error of only capturing the impact of the treatment, which is what Shadish et al. (2002) call mono-operation bias. We have also used multiple data collection methods and pilot studies. Using multiple sources of evidence helps to measure key concepts and not only measuring parts of them (Trochim, 2006). In this way, we have avoided mono-method bias, referring to the use of one single method resulting in only parts of the concept being measured (Shadish et al., 2002).

During some of the studies we conducted, there was the possibility that hypothesis guessing occurred. Our inquiries might have led to participants guessing the purpose of our study. It is possible that the participants answered based on what they thought we wanted to hear.

Otherwise, our focus on trust when testing the solutions might have influenced the degree of trust that the participants had to the presented solutions. The increased receptiveness due to testing is referred to as interaction of testing and treatment (Shadish et al., 2002; Trochim, 2006).

Some of our studies, such as the observations or usability testing, might have been influenced by how participants reacted to observation and testing. The potential for increased or reduced performance due to testing or observation is referred to as the Hawthorne effect or evaluation apprehension (Lazar et al., 2010; Shadish et al., 2002; Trochim, 2006). To avoid this, we tried to create relaxed atmospheres and focus on the fact that it was the concept or prototype that was evaluated, not the participants.

External validity

As described in chapter 3.6, external validity is related to generalization and if conclusions would hold for other persons in other places and at other times. All of the participants we used for the different studies were from the Oslo region. We acknowledge that the results may be different if using customers located in different cities or parts of the country. The cultural differences may even be bigger if comparing with other countries. In our case, we can only generalize our findings to similar customers in Oslo. When selecting participants for our studies we were faced with the challenge of which participants to include. Stake (2005), points out that even in larger case studies the sample size is often too small. In line with this, we acknowledge that it would be hard to generalize our findings based on our small selection of participants.

However, we have used the verification strategy of sampling sufficiency (see chapter 3.6), to ensure we have a sample of representable participants that have knowledge about online grocery shopping. Sampling sufficiency is similar to purposive sampling, as presented by Stake (2005). Throughout the project, we have done a careful selection of participants, a purposive sampling. This gives a greater potential for learning when having few participants (Trochim, 2006). The participants we have used include stakeholders such as leaders, employees, developers, designers and customers with experience from online grocery shopping because we wanted to build variety. The selection of these stakeholders was made because we thought they could give us valuable information in regards to our research topic. According to Stake (2005), one should do a purposive sample: "[...] building in variety and acknowledging opportunities for intensive study." (p. 451). He recommends that rather than

trying to obtain a formal sampling, researchers should try to select cases where there is a greater opportunity to learn. At the same time, he argues that this could mean to choose cases which are most accessible. Therefore, we used participants that were easily accessible when we did not have access to the purposively selected participants. In most of the activities, we had access to the stakeholders. For two of the studies we did not have access and we, therefore, chose to use other participants that we had access to, such as friends, family or co-students.

6.2 Design implications

Derived from our user studies, this master thesis presents three design implications. The design implications can be used by researchers, designers or service-providers for the development of trust in online grocery services. The three design implications are:

1. Provide more detailed information about perishable products
2. Allow open-ended questions for user feedback
3. Design for efficiency

1. Provide more detailed information about perishable products

Online grocery services should provide relevant information about their products because users desire knowledge when buying groceries online. This is even more important for products in the touch/see/smell category, such as perishable products. The product information should be displayed in the solution, such as weight and price, or other information of relevance. Providing information can help increasing trust in buying these products online. This design implication is based on the feedback we got from our users and the employees and executives in AB food. Proposed improvements on *Tinder for Perishable Products* and the *Stream* prototypes showed the need for product information, high-quality product pictures, information about the collection process and information about the employees that collected the groceries. The implication is in line with the related empirical study of Nepomuceno et al. (2014). They found that product knowledge reduces product risk, and can make users feel more confident, because expertise may compensate for not being able to touch the product.

2. Allow open-ended questions for user feedback

For the evaluation of online grocery services and the delivery, users should be provided with the possibility of giving feedback in the form of open-ended questions. One should avoid the use of close-ended questions for evaluation, such as rating. This applies particularly to C2C and B2C services where the users have a relation to the person conducting the work, because of the social risk associated with giving negative feedback. Instead of using rating for the evaluation, we recommend using feedback in the form of comments or a review. With the use of comments, one will avoid or reduce the social risk. In addition, comments and reviews give more valuable information that can be used for improvements in the future.

3. Design for efficiency

Most users consider online shopping as being a time saver. Therefore, additional services in the context of online grocery shopping should not increase the time spent on using the services. To achieve this it is important to design online grocery services that are efficient in use. This design implication is based on the feedback we got from our participants consisting of customers, employees of AB Food, and developers and designers collaborating with them. Most of the feedback and proposed improvements on *Tinder for Perishable Products* and the *Stream* prototypes were related to the lack of efficiency and time-saving. The participants were positive to the *Preference Feedback* prototype mainly because of its efficiency of use. This is not a new design implication as efficiency is a part of the ISO 9241-11 definition of usability (ISO, 1998). However, we highlight this design principle as important in the setting of design for online grocery shopping.

There will always be a need for balancing different design implications. As we saw from the *Stream* prototype, it presents detailed product information and allows open-ended questions for user feedback. However, it is not considered efficient by the users. The *Preference Feedback* prototype allows feedback and is efficient but does not provide sufficient information.

6.3 Lessons learned

This section reflects on the lessons learned throughout the project. We reflect on the scientific approach and design approach we have used. Further, we share our experiences with practicing some of the methods.

6.3.1 Approaches

We chose technology research as our scientific approach. As described in chapter 3.1, the approach starts with a need that the researcher seeks to satisfy. We found the need for increased understanding of customers' trust in online grocery shopping. Technology research seeks to solve the problem through the creation of an artifact. As we created prototypes to extend the understanding of risk, we found the approach to be a fit for our research. However, as we will present in the next section, we have done some adjustments to technology research.

We chose service design thinking as our design approach. One of the reasons for choosing this design approach was our concern with the design of services. According to Polaine et al. (2013), service designers are engaged in innovation and the development of existing services. Because we worked in the overlap between the creation of new, innovative services and the development of the existing online grocery store, we found service design suitable for our work. We found the holistic way of looking at all of the touchpoints between the user and the service to be useful for the development of services. In line with service design thinking, we wanted to include stakeholders. We found it important to work in multidisciplinary teams throughout the design process. By including people of interest, we have generated ideas from different perspectives. All of the different ideas have contributed to the two prototypes the *Stream* and *Preference Feedback*, which we presented in chapter 5.

In retrospect, we see that there are other approaches that also could have been used for this project. We believe the combination of technology research with service design share similarities to research through design (RtD). Instead of adjusting technology research to fit with the design of services, we could have used RtD. It does not only deal with the creation of products but is also concerned with the making of services and systems. In addition, RtD is a holistic, multidisciplinary and iterative approach (Zimmerman, Stolterman, & Forlizzi, 2010), in line with our adaption of technology research. The conduction of research in RtD is similar to technology research. However, if we had chosen another scientific approach, we would have done some changes to the study. As every scientific approach has its own characteristics, we would probably have had another focus of study, and our research question would have been different.

6.3.2 Adapting technology research

We have used technology research as our scientific approach, and service design as our design approach. The novelty of our approach is in combining these two approaches. The combination has given us new knowledge and valuable experience. We saw the need for adapting technology research because it is concerned with the creation and evaluation of new artifacts. While maintaining the goal of technology research, which is to create a new artifact that contributes with new knowledge, we have done some adjustments in the methods used.

Instead of creating artifacts, we have worked with the development of services. This means that we have adapted technology research to fit with the design of services. We have done this by combining technology research with service design thinking. We have not used hypothesis testing for the evaluation, typically used by technology researchers. Instead of using hypothesis testing for the evaluation of the new services, we have conducted group interview and usability testing. In the process of comparing the new services with the relevant need, we have included stakeholders throughout the design process.

While combining service design and technology research, we saw similarities in their concern with the creation of something that satisfies a need. In service design, prototypes are used with the intention of improving suggested ideas and solutions (Blomkvist & Segelström, 2014). In technology research, the creation of artifacts is used to contribute knowledge of general interest (Solheim & Stølen, 2007). In service design, customer journey maps and prototypes are used as tools for understanding and interpretation of the service (Blomkvist & Segelström, 2014). This was something we also experienced. In line with Blomkvist and Segelström (2014), we experienced that the customer journey maps provided insight about whether the proposed service would satisfy the needs or not. In this way, the customer journey map could work as an artifact or prototype, allowing us to iteratively create knowledge, through evaluation and improvement of the service. This is similar to Solheim and Stølen's (2007) description of technology research.

We compare technology research's iterative process with the phases of service design and the double diamond. We argue that the problem analysis, innovation, and evaluation is similar to the phases of exploration, creation, and reflection in service design, or discover, define and develop in the double diamond. While the focus of this master thesis has been to place our

activities in the double diamond, we argue that we still have conducted research following the iterative phases of technology research.

We argue that our way of using technology research, in combination with service design, has contributed to new and valuable knowledge. We hope this contribution can be of inspiration for other researchers who want to use technology research but are not concerned with the development of products. The process of technology research and service design is similar because both approaches start with a need and end up with creation. However, the activities and focus of the two approaches are different. As service design is process oriented and often leans towards consultancy, and our focus was on research, technology research was a good choice. By adapting technology research, we have demonstrated that it is possible to move outside of the established procedures.

6.3.3 Comparing research through design and action research

We identified similarities between research through design and action research. We were interested in research through design, and we could not find literature comparing it to the three scientific approaches presented in Solheim and Stølen (2007), therefore we did a small comparison ourselves. When comparing research through design with classical research, technology research and action research, we found that it shared similarities with all of them. However, action research was most closely related. The comparison showed that both of the approaches are concerned with the process leading to the solution. We argue that research through design follows the same iterative stages of problem analysis, innovation, and evaluation, as the three scientific approaches.

6.3.4 Using future workshop method in service design

We used future workshop together with stakeholders as a method to evaluate and improve the proposed *Cartpooling* service. Future workshop is originally from the field of participatory design. The reason we choose this method was that we believed future workshop would give a holistic approach to the traditional client workshop.

After the workshop was conducted, we evaluated it. Some of the participants liked the future workshop method because of the way the idea-generation started with the identification of all possible problems, instead of starting with possible solutions. The feedback from the

stakeholders indicated that they enjoyed using the future workshop. None of the stakeholders had used the method before, not even the designer or developer. We experienced that the future workshop helped to identify and explore issues and possible ideas for new services. This allowed the workshop to start with a divergent approach, in line with service design thinking. During the workshop, the ideas were narrowed down by selecting and elaborating one concrete solution. We experienced the method as being co-creative because it engaged the participants in all of the phases. Future workshop worked as a holistic method for structuring the workshop. Some adjustments were done to the method, as we adjusted the implementation phase by combining the future workshop with customer journey mapping. Our reasoning that future workshop is a useful method in service design, is supported by Polaine et al. (2013). As described in chapter 3.3, they point out that any method that helps in understanding people's motivations or behaviours, are considered as being contributors to a service design project.

We also found future workshop suitable in combination with customer journey maps. Our experience was that the customer journey map complemented the implementation phase. It visualized the ideas in a holistic way by giving an overview of all the touchpoints needed when interacting with the service. In retrospect, we see that the way the customer journey maps were made was similar to how Stickdorn and Schneider (2011) suggested making service blueprints. Service blueprints are detailed visual schematics that present individual aspects of a service, from the stakeholders' viewpoint. Making service blueprints collaboratively with people from different departments creates shared awareness. This is an effective way for co-creation (Stickdorn and Schneider, 2011).

Although service design uses methods from other disciplines, we have not found a service design project that uses the future workshop. As mentioned earlier in this section, future workshop is typically used in participatory design. Holmlid (2009b) claims that there seems to be an overlap between service design and participatory design. With the similarities between service design and participatory design, we believe future workshop is a good fit for the development of services.

6.3.5 Working with service design

As both researchers and designers, we believe it is important to emphasize that this is a research project primarily following the technology research approach. The service design

approach is therefore used to lead the design process. Throughout the project, we have tried to work in a multidisciplinary team. This means that we have included stakeholders representing other disciplines, such as executive and non-executive employees, developers, designers, costumers and other users. The cooperation with AB Food has both enabled contact with the user group but also put restrictions on how often it has been possible to involve the users. We acknowledge that we have not fulfilled all conditions for doing service design by the book. In the project, we have tried to select methods that work well in both technology research and in a service design perspective. In addition, our background may have influenced our understanding of how certain methods should be used.

It is relevant to ask if service design is fit to design trust-based services or technologies, as we used service design in the design process. We can only partly answer this question. Our experience with service design is limited. So is our experience with other approaches, giving us a limited foundation for comparison. We did not experience any noteworthy limitations with the design approach. We experienced that service design allowed for change to be made not only using technology but also through the organization, implementation, and execution, which we believe is a benefit of service design. This allows for removing non-technical trust issues.

The overlap between focusing on innovation and existing services is relevant for our study, and we argue that it is possible to work with both innovation and existing services. Our project started with the aim of creating an innovative service named *Cartpooling*. As presented in chapter 3, the different studies we have conducted has made us move away from *Cartpooling* because we discovered that there was a need for another kind of service. The services we have ended up with (the *Stream* and *Preference Feedback)* are new, but at the same time, they are an extension to the already existing online grocery store. This means that the services we have created can be applied to existing touchpoints but in a new way.

Our iterative design process has followed the service design phases of exploration, creation, and reflection. These phases have been translated to the similar four phases of the double diamond. The studies we have conducted have been placed in the double diamond to give a visualization of the design process (chapter 4.2, figure 6). We hope the visualization has given a clear presentation of the process and how we have worked in the different phases.

6.3.6 Working with prototypes

We experienced that customer journey maps could work as prototypes because both allowed for discussion and evaluation. Prototypes and visualizations (as customer journey maps) are helpful when discussing and evaluating ideas and concepts with stakeholders (Segelström & Holmlid, 2009; Sharp et al., 2015). We find the customer journey map similar to storyboarding and scenarios. These are common prototyping techniques because they show how a user might progress through a task or service (Sharp et al., 2015; Stickdorn & Schneider, 2011). This is supported by Kalbach and Kahn (2011) who claims that maps and diagrams are important in service design and that maps of interactions becomes a kind of paper prototype which " [...] allow stakeholders to cognitively run through the phases and steps involved in the service provision, permitting both issues and opportunities to be identified." (p. 4). The prototypes proved themselves as being useful items in discussions between (us) researchers but also in encounters with customers and other stakeholders.

We made the prototype through simulating the creation of the service by roleplaying. We used similar tools as would be used for the final solution. For instance, we video recorded with the use of a small camera placed on the chest in a store, instead of using large cameras in a studio setting. We took photos of the fruits and vegetables with a camera phone. In this way, we learned about the feasibility of the prototypes before they were implemented. We learned how much time it would take, understood if there was enough lighting, if it required much attention, among other things. We regarded the simulation as being helpful.

6.4 Ethics

To ensure that the participants had received enough information about the studies and the purpose of their participation, we worked closely with AB Food, who helped with recruitment. For every study, we gave the participants a consent form (appendix I) as described in chapter 3.7.1. The consent form contained information about the purpose of the study, who had access to the data, how and for how long the data was going to be stored. We also evaluated if the participants were competent to consent to the participation, e.g. that the participants did not have reduced cognitive abilities and the like. Vulnerable groups such as elderly, children and people with chronic illnesses have been omitted to not pressure them.

While conducting the studies, we tried not to intimidate the participants by creating a welcoming atmosphere. When involving employees we encountered an issue with representation, as we had executive and non-executive employees participating in the same workshop. The non-executive employees might have felt pressured to give positive feedback on an idea they did not like, due to the executive employer's enthusiasm for the solution. Another question was the motive for participation, as they got a salary to participate in the workshop. We, therefore, considered the ethical issues on offering monetary or non-monetary rewards for participation.

As discussed in chapter 3.7.2, systems that are poorly made may have a negative impact on the everyday life of people. It is, therefore, important to avoid the bad influence by having users participate in the development (Robertson & Wagner, 2012). We hope that our work, including a wide variety of users, have had the same positive contribution to the services we have made. By including customers, employees, designers and developers throughout the design process, we hope that we have succeeded in making a service that has a positive, instead of negative, influence on their everyday lives.

We have considered if our research could provide an ethical problematic result, which could be used for unethical purposes. We know that there will always be a risk of misuse of research on trust. However, as our research builds on known trust and design principles, we believe the probability of misuse of our research is small.

In a further development of the prototypes, we see that it is important to improve the privacy protection of the customers. This is important for the ethical aspects of the service, but also for legal reasons, for AB Food, and their customers. To handle the customers' protection of privacy in the *Stream*, sensitive parts in the video, such as peoples' faces, can be blurred. The data should only be stored for as long as the service is in use. It is also important to implement security features to protect the data, as we showed that some customers found certain groceries to be private or sensitive.

7. Conclusions and future work

In this chapter, we present the concluding statements of our research. Further, we give a summary of the contributions of this study. In the end, we present our proposal for future work.

Throughout the research project, we have posed the following research question:

How to increase the trustor's perception of the trustee's ability to collect groceries for online orders?[17]

The research question has been addressed through the creation and evaluation of concepts and prototypes. The prototypes have extended our understanding of how to increase customers' trust in online grocery shopping. The prototypes have contributed to knowledge on using different forms of feedback as a way of increasing customers' perception of the ability of the person collecting groceries.

To answer the question, we have used technology research and created concepts and prototypes by doing service design. The development of new and improved services was based on results from the studies conducted throughout the project. We have also worked closely with stakeholders and sought inspiration from empirical studies and related work. The prototypes have been evaluated through group interview and usability testing, followed by interviews related to trust.

Whether the prototypes answer the research question, has been discussed in chapter 6. We do not have extensive evidence that they increase the *trustor's perception of the trustee's ability*. However, we find that the prototypes have the potential to increase customer trust in online grocery shopping by offering possibilities for feedback about products that can be used for learning about customers' preferences. In addition, our research indicates that feedback can act as a safeguard because it gives customers the chance to influence the employee's selection of groceries in accordance with their own preferences.

[17] In our context, the trustor will be the customer who orders the groceries online. The trustee will be the person collecting the groceries delivered to the customer. The ability to select groceries means collecting groceries of high quality, in accordance to the customer's preference.

7.1 Contributions

This section presents the contributions of our research project.

1. Increase understanding of risks experienced by customers of online grocery services

One of the contributions of this research has been the increased understanding of risks related to online grocery services. Previous research (i.e. Bhatnagar, 2000) has identified that the most prominent perceived risks in online grocery shopping are financial risk and product risk. Our research has confirmed the presence of product risk as a major risk in online grocery services. In addition, our research has extended the knowledge of risks, through the finding of social risk in online grocery B2C and C2C services. Customers asked to give feedback on online services found it uncomfortable to give feedback in the form of rating to the person collecting their groceries.

2. Develop and evaluate prototypes to increase trust in online grocery shopping

Another contribution has been the development and evaluation of prototypes. The prototypes have increased the knowledge on how to increase customers' perceptions of the employees' ability to collect groceries. The prototypes allow customers to give feedback in order to increase the employees' knowledge and ability.

The prototypes have increased the understanding of the use of feedback between the actors in online grocery services. Although related online grocery services (e.g. Vigo, GodtLevert) have enabled customers to give feedback on the service in the form of rating, our evaluations have found that rating in online grocery shopping is associated with social risk. In the evaluations, we discovered that rating in online grocery shopping is associated with social risk. We found that feedback in the form of comments was more useful to increase the trustor's perception of the trustee's ability to select perishable groceries. Through feedback, the employee can learn about the customers' preferences. The prototypes explored different ways of enabling customers to give feedback about products at different phases of the purchase process (before, during, and after). Our findings indicate that the use of feedback in online grocery services could create institution-based trust. The feedback could be used as a safeguard or safety net, because the customers may feel they can prevent the selection of groceries that do not meet their expectations. By giving feedback to the person collecting the

groceries, before and after the groceries have been delivered to the customer, we found that the solution could act as a safeguard for the specific order.

We believe this contribution is useful for services in other contexts as well. When designing services, researchers, designers and service providers should consider what kind of feedback they request.

3. Propose design implications for increasing trust

Based on our findings, we proposed design implications for increasing trust and reducing product risk and social risk in the context of online grocery shopping. The design implications we presented includes *provide more detailed information about perishable products, allow open-ended questions for user feedback* and *design for efficiency*. The design implications are useful for researchers, developers and designers developing online grocery services.

4. Adapt technology research to fit the creation and evaluation of services

The novelty of our approach was the adaption of the research approach named technology research to fit the creation and evaluation of services. Technology research is concerned with the development and evaluation of artifacts. In this research project, we have developed a service. Therefore, we saw the need for adapting the scientific approach. The contribution was made by combining technology research with the interdisciplinary design approach of service design thinking.

This means that in the development of services, we have followed a service design thinking process. The involvement of stakeholders, co-creation, innovation and a holistic approach has been central. Some modifications on the methods have also been made. Instead of evaluating the prototypes with hypothesis testing, typically used in technology research, we have conducted usability testing. We believe that the combination of technology research and service design is valuable for the research fields of service research, service science, service engineering and service innovation. This means that our combination can be used as a framework for research within fields that are concerned with research on services.

7.2 Future work

Prototype development

Based on the feedback from the usability testing, we recommend doing some improvements to the prototypes.

In the *Stream,* we suggest making a short presentation of the employee collecting groceries, in order to increase the information in the solution. Further, we recommend finding a way to address the problem of the prototype being perceived as time-consuming. As discussed in section 6.4, we also see the need to work on privacy issues by blurring faces and securing stored data. In *Preference Feedback* we suggest to remove the first screen "Were you satisfied with the delivery?" and adjust the text on the second screen to "What do you want to give feedback on?". The last screen, which confirms that the customer gets a refund, should be rephrased so it also contains an apology for the inconvenience.

After these improvements, it would be necessary to run another round of usability testing to ensure the issues were solved. After testing the prototypes with customers, we recommend conducting tests with the employees before the service is developed and implemented. In the future, the *Stream* could be extended into being a virtual shopping space, to make it possible to click directly on products in the video and shop on impulse. It is also possible that the two services could be combined or merged

In a further development of the prototypes, it would have been necessary to include universal design. The goal of universal design is to design for all target groups simultaneously through the development of one main solution (Sandnes, 2011). This solution should remove the need for designing additional solutions for specific user groups. Including principles of universal design will make the solution easier to use for all users. This is particularly important in Norway as universal design of ICT solutions are legally required (Difi - Direktoratet for forvaltning og IKT, n.d.).

Future research

We acknowledge that trust is built over time. Our studies have investigated the services' initial potential to build trust. To confirm our findings, we propose to conduct a longitudinal, quantitative study with a mix of new and existing users of the online grocery store. In the start of the study, we propose to survey the users' propensity to trust (personality-based trust).

If we were to continue doing research on this topic, we could have investigated how trust develops over time. We recommend future researchers interested in this research topic to investigate the development of current trust in the current online grocery service, the perceived ability of the employees and customers' perception of product risk. This has not been possible for us to do, as we have not had the time to do a longitudinal study, nor have we had access to enough users to survey to trust the validity of such a study.

During the study questions of interest has been raised such as: Can the future workshop method offer a holistic approach for conducting client workshops in service design? Does service design favour work with trust, as trust is important in all parts of a service? Are there other important risk factors in an online C2C grocery store, e.g. time or opportunity cost (Jacoby & Kaplan, 1972)? Which business model, C2C or B2C, contributes to increased trust in online grocery shopping? How can crowdsourcing and service design thinking improve trust in online grocery shopping? These questions address interesting research topics, which could also lead to future studies.

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Appendix A. Interview Guide

Intervjuguide Netthandelskunder

Introduksjon (3 min, 3)

Hei! Velkommen til dette intervjuet.
Mitt navn er xxxxx, master-student ved Institutt for Informatikk, og dette er xxx som er forsker ved SINTEF.

Denne studien gjennomføres som en del av Master-prosjektet på Institutt for Informatikk, og er i samarbeid med SINTEF og [redacted]. Hensikten med dette intervjuet er å undersøke hvordan teknologi kan brukes til å fremme tillit og til å skape bedre samhold i nabolaget. Spesielt ser vi på ulike temaer knyttet til matvarehandel på nett og tilleggstjenester knyttet til dette.

<BE INFORMANTEN LESE SAMTYKKESKJEMA OG SIGNERE>
Samtykkeskjema, konfidensialitet

Intervju tar ca 30 minutter. Vi tar lydopptak i løpet av intervjuet. Jeg minner om at ikke noe av det du sier i intervjuet kan spores tilbake til deg som enkeltperson, og du bestemmer selv hva du har lyst til å svare på. Deltakelse er frivillig og du kan når som helst trekke din deltakelse tilbake.

Jeg setter på lydopptakeren, så kan vi begynne:

Spørsmål
Alle:
Bakgrunnsinformasjon (3 min, 6)

- Hvor gammel er du?
- Hva jobber du med?
- Kan du fortelle litt hva gjør du på en typisk hverdag (f.eks. i går?)
  (start opptak her)
- Hva slags type bolig bor du i
- Hvor mange er dere i din husholdning?
- Kan du si noe om nabolaget, hva slags type folk som bor der? (eldre, yngre, småbarnsfamiler)
- Kan du fortelle litt om ditt forhold til naboene dine?
  - I hvilke settinger møter du naboene dine?

*

Matvarehandel (7 min, 13)

- Hvor ofte og når pleier du å handle matvarer?

- Evt. er det langt unna/bruker du mye tid på å komme deg dit?

· Kan du si litt om hvorfor du begynte å handle mat på nett?

· Hvordan opplever du å handle matvarer i nettbutikk?
  - Vil du anbefale andre til å bruke den?
  - Vil du fortsette å handle matvarer i nettbutikk?
  - Opplevde du det som trygt?

· Har du erfaring med flere netthandelstjenester for matvarer?
  - Hvis ja, hvordan synes du den var sammenlignet med [redacted] sin nettbutikk? Er det noen funksjoner som de har som du savner hos [redacted]? Hvorfor?

· Har du brukt noen "delingstjenester" på nett? F.eks über eller AirBnB.

· Hva tenker du om *en nettbasert tjeneste som knytter naboer sammen med hensikt å handle for hverandre. Du velger varer og betaler på forhånd, og naboen frakter dagligvarene hjem til deg. Eller omvendt; du mottar handleliste, og når du handler mat, plukker/skaffer du også varene til naboen og leverer de hjem til vedkommende?*

· Ville du ha brukt en slik tjeneste?

· Ser du noen fordeler ved denne tjenesten?

· Ser du noen umiddelbare utfordringer ved en slik tjeneste?

· Ville du ha latt naboene dine handle for deg?

· Ville du ha handlet for naboen?
  - Hvis nei, hvorfor ikke?
  - Hvis ja, hvorfor?

Tillit og motivasjon (10 min, 23)

· Ser du for deg at andre enn naboene dine kunne ha handlet for deg? Evt. kunne du ha handlet for andre enn kun naboen?
  - F.eks folk som befinner seg i nærheten, eller handle inn for f.eks eldre

· Deltar du på frivillig arbeid? Eller gjør du noe frivillig for andre? F.eks dugnader eller samkjøring av barn, bilkollektiver e.l.
  - Hvis nei, hvorfor ikke? Hva skal til for at du deltar?
  - Hvis ja, hvorfor?
  - Kan du fortelle litt om hva som motiverer deg til å hjelpe andre?
  - *Hvordan kan man motivere folk til å handle for andre?*
    - *Hva med deg? (Hva ville motivere deg for å handle for naboen din?)*

· Hva ville du synes om å gi en rating/karakter på de som leverer varene? <her kan vi vise uber skjerm med rating>

· Hva ville du ha tenkt om å få en rating/karakter når du leverte varer?

· Hva synes du om at det samles data om deg og dine matvarevaner? (bigdata)
- Stoler du på at bedriftene bruker data om deg til din fordel?
- Hva synes du om at naboen får vite hva du handler når du bruker tjeneste?

· Hvordan skulle man ha organisert tidspunkt for levering av varene?
- Ville du ha stolt på at personen kommer til rett tid?

· Hvor viktig er det at du får nøyaktig de samme matvarene som du ba om?
- Ville du ha stolt på at den som handler for deg plukker de riktige varene?

Avslutning 3 min, ca. 26 min totalt

Tusen takk for at du kunne stille opp til intervju.

(*husk å gi dem gavekort)

Har du noen spørsmål eller kommentarer til oss?

Appendix B. Workshop Plan

Agenda workshop

1. Introduksjon - 10 min

- Ønske velkommen + fortelle om prosjektet*
- Ta en runde med Navn og hva de jobber med
- Gå gjennom agenda for workshop
- Samtykkeskjema
    i. Gå gjennom
    ii. Informere om bilder og feltnotater

2. Gruppearbeid - 40 min

- Dele inn i 2-3 grupper (tenke på fordeling)
- Dele ut utstyr/verktøy
- Jobbe i grupper:
    i. Future Workshop;
    ii. Kritikk-, fantasi- og implementasjonsfase

3. Pause 10 min

Kaffe og frukt/kake

4. Gruppearbeid - 20 min

- Customer Journey Map

5. Presentasjon av gruppearbeid - 15 min

6. Evaluering av Workshopen - 5 min

7. Avslutning

Manus:

1. *Forklaring av prosjektet:*
Vi er to studenter ved Universitetet i Oslo, Institutt for Informatikk. Vi går siste året av masterprogrammet Interaksjonsdesign. Denne studien gjennomføres som en del av masteroppgave ved Institutt for informatikk (IFI), og er et samarbeid mellom Center for Service Innovation (CSI), SINTEF og [redacted]. Masteroppgaven vår handler om å designe en forbedret opplevelse av matvarehandel på nett.

Hensikten med workshopen er å utforske og idémyldre rundt temaer knyttet til tillit og motivasjon ved bruk av matvarehandel på nett. Gjennom service design thinking skal vi tilrettelegge for et kreativt miljø, hvor vi gjennom ulike teknikker kommer frem til ideer sammen. Ideene skal brukes til å videreutvikle [redacted]s nettjenester.

Dagens agenda er som følger; vi skal først ta en introduksjonsrunde, hvor alle sier hva de heter og hva de driver med. Deretter skal vi dele opp i grupper, hvor vi skal jobbe med en metode som heter Future Workshop. Vi kommer tilbake med forklaring på hva det er. Deretter blir det en kaffepause på 10 minutter. Så skal gruppene utvikle customer journey maps/kundereise (vi går gjennom det også etterpå). Deretter blir det

**2. Forklaring av Future Workshop*

I dag skal vi jobbe med flere kreative aktiviteter sammen i grupper. Det første vi skal gå gjennom er future workshop. Her skal vi gjennom 3 faser.

Den første er **"kritikk-fasen"** som går ut på å idémyldre kritisk rundt temaer knyttet til tjenesten. Tenk på alle mulige problemer som kan dukke opp ved tjenesten tjenesten og skriv ned. Mer spesifikt tenker vi på hvilke problemer som kan oppstå ved matvarehandel på nett i dag, alt fra plukking i butikk, ferskvarer, levering av varer, opplevelsen av å handle på nett vs. opplevelsen av å handle i butikk, automatisering, miljøperspektiv osv.

Den andre er **"fantasi-fasen"** hvor man idemyldrer løsninger på problemene man har funnet. Her er det lov å være kreativ og finne på teknologi som ikke finnes, utopiske og urealistiske løsninger, alt er lov!

Den siste fasen er **"implementerings-fasen"**. Her velger dere de mest realistiske og gjennomførbare løsningene fra "fantasi-fasen". Dere videreutvikler dem i større grad og presenterer dem ved hjelp av et Customer Journey map. Her skal dere visualisere hele kundereisen, det vil si…. At man ser for seg bruk av tjenesten som en reise som starter første gang man blir oppmerksom på tjenesten og er i kontakt med noe/noen fra tjenesten til problemet er løst. Dette gjør dere ved å lage ulike touchpoints/kontaktpunkter, som er de gangene kunden interagerer med andre og med systemet/tjenesten. Dokumenter også positive og negative følelser som brukerne kan ha på de ulike kontaktpunktene, ved hjelp av fargede klistremerker.

Appendix C. Observation Plan

Observasjon & Intervju - Plukkere i butikk

Observasjon

Tid, sted
Hendelsesflyt
Hvem plukker
Hvor mange plukker
Hvordan pakkes varene
Hvor lang tid bruker man på hver bestilling?
Er det mye ventetid?
Hva skjer ved frukt/ferskvaredisken? Hvilke refleksjoner gjør plukkern seg her?
Plukkes det for flere kunder samtidig? Evt. hvor mange?
Følges det en fast rute gjennom butikken?
Hvilke varer pukkes først/sist?
Avvik?

Intervju

1. Hvor lenge har du jobbet i [redacted]?
2. Hvilke arbeidsoppgaver hadde du før du ble "plukker"?
3. Kan du fortelle om en typisk dag på jobb?
4. Hvordan plukker du varer?
5. Hvor ofte plukker du varer?
6. Når på døgnet plukker du varer?
7. Hva gjør du om en vare ikke finnes i lagerbeholdning i butikken?
8. Hvor lenge i forkant av levering plukker dere varene?
9. Hvor oppbevares varene som plukkes?
10. Tar dere hensyn til spesielle behov/ønsker fra kunden? Hvis ja, hvordan?
11. Hender det at du tar direkte kontakt med kunden?
12. Hvordan får dere tilbakemelding fra kunder om plukkingen?
13. Hvordan behandler dere eventuelle klager?
14. Hva fungerer godt med prosessen?
15. Hvilke utfordringer har du/ser du?
16. Har du forslag til eventuelle forbedringer i plukkeprosessen?

Appendix D. Interview guide with board leader

Intervju med styreleder i borettslag

Hei vi er to master studenter fra UiO, Vi jobber med en oppgave om matvarehandel på nett, i samarbeid med [redacted] og ser på muligheten for en ny tjeneste. Vi tenker at intervjuet kommer til å vare i ca 20 minutter, det er frivillig å delta og du kan trekke deg.
samtykkeskjema

Bakgrunn:

1. Hvor gammel er du?
2. Hvor lenge har du vært styreleder?
3. Kan du fortelle om noen oppgaver du har som styreleder i borettslaget?
4. Hvor mange boliger er det i borettslaget?
5. Hva slags type mennesker bor det her?
6. Hvor ofte blir du kontaktet av beboerne?
7. Hvor ofte har dere styremøter ca?
8. Hva slags felles aktiviteter er det for beboerne i dag
    a. Type dugnad etc.
    b. Hvor ofte

8. Har borettslaget noen verdier?

- Miljøvennlig, familievennlig etc.?

Handling:

9. Hvordan handler du inn matvarer?
10. Har du erfaring med å handle matvarer på nett?
11.. <forklare tjenesten>. Hva tenker du om en slik tjeneste?

· Ser du noen fordeler ved denne tjenesten?
· Ser du noen umiddelbare utfordringer ved en slik tjeneste?

1. Hvem tar besluttinginen? (om å opprette en slik avtale)
2. Hvor lang tid ville det tatt å fatte en slik besluttning?
3. Ville det vært naturlig at borettslaget tok noen kostnader?
4. Hvor stor del av borettslaget måtte deltatt for at bet skulle vært borettslgaet “sin greie” og ikke en privat “greie”

Tusen takk for at du kunne stille opp til intervju.
Har du noen spørsmål eller kommentarer til oss?

Appendix E. Focus group plan

Plan for gjennomføring av fokusgruppe

Introduksjon

- Ønske velkommen
- Forklare hensikt med fokusgruppen (Hjelpe oss med å ta designvalg når vi skal lage prototyper)
- Navnerunde
- Gå gjennom agenda for fokusgruppen (I dag skal alle først svare på en kort spørreundersøkelse om tillit i forbindelse med matvarehandel på nett, spesifikt knyttet til to ideer vi har. Deretter kommer vi vil å ta en felles sesjon hvor vi stiller noen spørsmål relatert til spørreundersøkelsen).
- Samtykkeskjema

Customer Journey maps

- Høre om deltakerne har erfaring med å kjøpe matvarer på nett. Om deltakerne ikke har det, forklare kort hvordan det fungerer i dag.
- Fortelle at vi ønsker å teste to ulike løsninger;
    - Forklare om løsning 1 (Cartpooling, kjent aktør)
        - Cartpooling er [forklaring]
    - Forklare om løsning 2 (Borettslag, ukjent aktør)
        - Borettslagsløsningen er [forklaring]

Spørreundersøkelse

- Fortelle om spørreundersøkelsen:
    - “Spørreundersøkelsen presenterer to ulike scenarier. Scenarioene blir presentert én om gangen, og er knyttet til en av løsningene. Her skal dere svare på noen spørsmål. Hvis dere lurer på noe, er det bare å si ifra.”

Spørreundersøkelse

Scenario 1 (Kjent aktør)
Du benytter matvarehandel på nett og bestiller dagligvarer. Butikken tilbyr at en av naboene dine som skal i butikken samler inn varene og leverer dem til deg.

Scenaro 1.1 (Ukjent aktør)
Du benytter matvarehandel på nett og bestiller dagligvarer. Butikken tilbyr at en ekstern, personlig “plukker”, tilknyttet borettslaget ditt samler inn varene i butikken og leverer dem til deg.

Svar på følgende spørsmål;

Spørsmål om social risk
På en skala fra 1-7, hvor 1 er veldig ukomfortabel og 7 er veldig komfortabel;
Hvor komfortabel er du med å gi X rating (vurdering) etter leveransen?
(Veldig ukomfortabel - Ukomfortabel - Litt ukomfortabel - Nøytral - Litt komfortabel - Komfortabel - Veldig komfortabel)

Om du mottar en dårlig ferskvare fra X, hvilken rating (vurdering) vil du gi?
Dårlig rating - Nøytral rating - God rating - Ingen rating - Vet ikke

Om X gir ekstra god service, hvilken rating (vurdering) vil du gi?
Dårlig rating - Nøytral rating - God rating - Ingen rating - Vet ikke

På en skala fra 1-7, hvor 1 er "i ingen grad" og 7 er "i veldig stor grad";
I hvilken grad tenker du at ratingen (vurderingen) din av X vil påvirke ditt (personlige) forhold til X?

På en skala fra 1-7, hvor 1 er "i ingen grad" og 7 er "i veldig stor grad";
Om du mottar en dårlig ferskvare, i hvilken grad ville dette påvirke ditt (personlige) forhold til X?

Spørsmål om product risk (ability)

På en skala fra 1-7, hvor 1 er "i ingen grad" og 7 er "i veldig stor grad";
I hvilken grad stoler du på at x plukker de *forventede* varene?

På en skala fra 1-7, hvor 1 er "i ingen grad" og 7 er "i veldig stor grad";
I hvilken grad stoler du på at x plukker varer etter din preferanse?

På en skala fra 1-7, hvor 1 er "i ingen grad" og 7 er "i veldig stor grad";
Om varen du bestilte er utsolgt, i hvilken grad tror du x ville ha valgt gode erstatningsvarer?

På en skala fra 1-7, hvor 1 er "i ingen" og 7 er "i veldig stor";
Hvor stor risiko opplever du ved tjenesten?

Spørsmål om løsningene (for å kunne ta bedre designvalg)

Nabofellesskap

Hvilke utfordringer ser du ved Nabofellesskapsløsningen?

Hvilke fordeler ser dere ved Nabofellesskapsløsningen?

Borettslag

Hvilke utfordringer ser dere ved Borettslagsløsningen?

Hvilke fordeler ser dere ved Borettslagsløsningen?

Begge løsningene

Hvilken av de to tjenestene ville dere ha brukt?

- Hvorfor?

Ville dere ha foretrukket at en dere kjenner fra før av, f.eks naboen, hadde handlet for dere, eller en person dere ikke kjenner fra før av, men som du etablerer et forhold til over tid, handler for dere?

- Hvorfor denne personen?

Har dere forslag til hvordan løsningene kan forbedres?

Har dere noen kommentar til oss, noe dere ønsker å legge til?

Appendix F. Questionaire

Nabofellesskap

Bruk illustrasjonen og scenariet som du har fått utdelt for å svare på spørsmålene nedenfor.

Hvor komfortabel er du med å gi naboen rating (vurdering) etter leveransen?

	1	2	3	4	5	6	7	
veldig ukomfortabel	○	○	○	○	○	○	○	veldig komfortabel

Om du mottar en dårlig ferskvare fra naboen, hvilken rating (vurdering) vil du gi?

- ○ Vet ikke
- ○ Ingen rating
- ○ God rating
- ○ Nøytral rating
- ○ Dårlig rating

Om naboen gir ekstra god service, hvilken rating (vurdering) vil du gi?

- ○ Vet ikke
- ○ Ingen rating
- ○ God rating
- ○ Nøytral rating
- ○ Dårlig rating

I hvilken grad tenker du at ratingen (vurderingen) din av naboen vil påvirke ditt (personlige) forhold til vedkommende?

	1	2	3	4	5	6	7	
ingen grad	○	○	○	○	○	○	○	veldig stor grad

Om du mottar en dårlig ferskvare, i hvilken grad ville dette påvirke ditt (personlige) forhold til naboen?

	1	2	3	4	5	6	7	
ingen grad	○	○	○	○	○	○	○	veldig stor grad

I hvilken grad stoler du på at naboen plukker de forventede varene?

	1	2	3	4	5	6	7	
ingen grad	○	○	○	○	○	○	○	veldig stor grad

I hvilken grad stoler du på at naboen plukker varer etter din preferanse?

	1	2	3	4	5	6	7	
ingen grad	○	○	○	○	○	○	○	veldig stor grad

Om varen du bestilte er utsolgt, i hvilken grad tror du naboen ville ha valgt gode erstatningsvarer?

	1	2	3	4	5	6	7	
ingen grad	○	○	○	○	○	○	○	veldig stor grad

Hvor stor risiko opplever du ved tjenesten?

	1	2	3	4	5	6	7	
ingen	○	○	○	○	○	○	○	veldig stor

Appendix G. Group Interview

Agenda Group Interview

- Introduksjon - 10 min
    - Velkommen - 5min
    - Oppsummering frem til nå - 5min

- Prototype The Stream - 15 min tot:25
    - Demonstrasjon
    - Spørsmål

- Prototype Tinder Ferskvare - 15 min tot:40
    - Demonstrasjon
    - Spørsmål

- Prototype Preference Feedback - 15 min tot: 55
    - Demonstrasjon
    - Spørsmål

- Pause - 10min tot: 01:05
- Diskusjonsspørsmål - 15 min tot: 1:20
- Evaluering av WS og veien videre: 15 min tot: 1:35

Manus

Introduksjon - 10 min

- Velkommen - 5min
- Gå gjennom agenda (I dag skal vi presentere tre ulike prototyper som vi har laget med påfølgende spørsmål til hver av dem. Til slutt ønsker vi å diskutere alle prototypene og få tilbakemelding fra dere).
- Bakgrunn- 5min

Etter forrige workshop har vi jobbet videre med "borettslagsløsningen" som gikk ut på å opprette en kollektiv handleavtale med et borettslag og tildele beboerne en fast plukker. Den faste plukkeren skulle på sikt få kjennskap til kundens preferanser, slik at vedkommende kunne gjøre en bedre jobb. Dette konseptet testet vi gjennom to fokusgrupper som vi holdt med til sammen xx deltakere. Tilbakemeldingene vi fikk var at det opplevdes som litt ubehagelig å gi negativ tilbakemelding til en plukker som du skulle møte jevnlig. Og at ideen med å ha en logg på hver kunde, gjør det unødvendig med en fast/personlig plukker.
På bakgrunn av dette har vi gått bort i fra ideen om en fast plukker. Vi har undersøkt hvordan man kan forbedre plukkeprosessen for å øke kundens tillit til at det blir levert varer etter vedkommende sine preferanser.

Om prototypene
Vi har jobbet videre med et av problemene som vi har fått tilbakemelding om; utfordringer knyttet til om plukkeren velger riktige varer etter kundens preferanser. Vi har tre ulike forslag

til hvordan det kan løses, hvor to av dem går ut på at kunden får være med på å vurdere ferskvarene før de leveres til kunden.

Prototype The Stream - 15 min tot:25

Scenario: Du er inne i nettbutikken og legger inn en bestilling av matvarer for hele uken. Etter at du har fullført bestillingen får du opp følgende sms. (vise frem sms: Se gjennom varer)

- Demonstrasjon
- Spørsmål:
- Føler dere at prototypen gir nok informasjon slik at du som kunde ser at dine preferanser blir fulgt?
- Føler dere at prototypen gir den ansatte i [redacted] kunnskap om kundens preferanser?
    - Hvorfor/hvorfor ikke?
- Hvilken kunnskap får han/Hvilken kunnskap kunne de trenge?
- Viser prototypen at den ansatte har kunnskap om varene?
    - I hvilken grad?
- Gir prototypen den ansatte mer kompetanse til å plukke varer etter kundens preferanse?
- Er det noe annet vi kunne ha lagt til i prototypen som kunne hjulpet den ansatte til å gjøre en bedre jobb (når han/hun plukker frukt/grønt)?

Prototype Tinder Ferskvare - 15 min tot:40

Scenario:

Du har nettopp lagt inn en bestilling av matvarer for hele uken i nettbutikken. Ved bestilling kan du velge om du vil gjennomgå varene. Etter at du har fullført bestillingen, mottar du en sms. (vise sms).

Vise frem prototype.

- Demonstrasjon
- Spørsmål:
- Føler dere at prototypen gir nok informasjon slik at du som kunde ser at dine preferanser blir fulgt?
- Føler du at prototypen gir den [redacted] ansatte kunnskap om kundens preferanser?
    - Hvorfor/hvorfor ikke?
- Hvilken kunnskap får han/Hvilken kunnskap kunne de trenge?
- Viser prototypen at den ansatte har kunnskap om varene?
    - I hvilken grad?
- Gir prototypen den ansatte mer kompetanse til å plukke varer etter kundens preferanse?
- Har du noen tanker om hva som kan hjelpe dem til å gjøre en bedre jobb (når de plukker frukt/grønt)?
- Er det noe annet vi kunne ha lagt til i prototypen som kunne hjulpet den ansatte til å gjøre en bedre jobb (når han/hun plukker frukt/grønt)?

Prototype Preference Feedback - 15 min tot: 55

Scenario:

Som kunde av nettbutikken lagres informasjon om deg og din kjøpshistorikk på din profil. Ved bestilling av varer får du mulighet til å legge til kommentarer ved hvert produkt i kategorien "ferskvare". *(Vise frem prototype del 1 bestilling).*

Etter at varene har blitt levert, mottar du en sms (vise sms).

- Demonstrasjon (vise frem prototype del 2)
- Spørsmål:
- Føler dere at prototypen gir nok informasjon slik at du som kunde ser at dine preferanser blir fulgt?
- Føler dere at prototypen gir den ansatte i [redacted] kunnskap om kundens preferanser?
    - Hvorfor/hvorfor ikke?
    - Hvilken kunnskap får han/Hvilken kunnskap kunne de trenge?
- Viser prototypen at den ansatte har kunnskap om varene?
    - I hvilken grad?
- Gir prototypen den ansatte mer kompetanse til å plukke varer etter kundens preferanse?
- Er det noe annet vi kunne ha lagt til i prototypen som kunne hjulpet den ansatte til å gjøre en bedre jobb (når han/hun plukker frukt/grønt)?

Pause - 10min tot: 01:05

Diskusjonsspørsmål - 15 min tot: 1:20

- I hvilken grad stoler du på at plukkeren (ansatte) har kompetanse til å gjøre en god jobb (når de plukker frukt/grønt)?
- Hvilke positive sider ser dere ved prototypene?
- Hvilke svakheter ser dere ved prototypene?
- sammenligne dem?
- Hva synes dere om de forskjellige prototypene?
- Hvilken prototype foretrekker dere?
    - Hvorfor?
- Presenteres prototypene på en forståelig måte?
    - Forstår dere hvordan prototypene brukes?
- Forbedringspotensiale?
- Noe dere savner?
- Er de distraherende?/Irriterende?
- Ville dere ha brukt løsningene?
    - Hvis ja; Hvilke produkter ville dere ha brukt den på?

Evaluering av WS og veien videre: 15 min tot: 1:35
Oppsummere funn
Si noe om at vi ønsker å gjøre forbedringer å teste med brukere for så å levere i mai

Hvordan opplevde dere WS?
Noe vi kunne gjort bedre? Trengte dere noe mer tid?

Appendix H. Usability testing

Agenda Usability testing

- Introduksjon
    - Velkommen
    - Hensikt med brukertest - hva vil vi oppnå
    - Samtykkeskjema
- Prototype The Stream
    - Brukertest
    - Spørsmål om tillit
- Prototype Preference Feedback
    - Brukertest
    - Spørsmål om tillit
- Diskusjonsspørsmål
- Avslutning

Manus

Introduksjon 10 min tot:10

- Velkommen + hensikt (hva vi vil oppnå):
    - Vi er to masterstudenter ved Institutt for Informatikk, som samarbeider med [redacted] og [redacted]. Vi jobber med å utvide dagens nettbutikkløsning og undersøker hvordan mulighet for tilbakemelding og reklamasjon kan forbedres.

      Hensikten er å undersøke hvor enkle de nye funksjonene er å bruke og forstå. Og om de bidrar til å gjøre deg som kunde trygg på at du får varer av høy kvalitet og etter din preferanse
    - Agenda i dag er at vi først skal gå gjennom og teste to nye ideer, etterfulgt av spørsmål til hver av dem. Etter at vi har gått gjennom disse, kommer vi til å ha en diskusjon rundt begge løsningene.
    - Samtykkeskjema

  Før vi går over til prototypene har vi noen få spørsmål relatert til dine holdninger til dagens netthandel

- Hvor viktig er det for deg at de ansatte gjør en god jobb når de plukker dine varer?
- Stoler du på at plukkeren har kompetanse til å gjøre en god jobb?
- Har du opplevd å ha mottatt varer du ikke var fornøyd med?
    - Hva gjorde du med det (Hvordan opplevde du prosessen med å gi tilbakemelding?)?

Prototype The Stream 15min tot:25

Scenario: Du er inne i nettbutikken og legger inn bestilling av matvarer for hele uken.
(Vise frem skjermbilde av bestillingssiden)

Her får du mulighet til å gjennomgå varer, det vil si at du kan se varene før de blir levert hjem til deg, så du velger å gjennomgå noen av dem.
En liten stund etter at du har fullført bestillingen og den ansatte har plukket varene dine, får du følgende beskjed på e-post. *(Vise frem e-post og starte prototype)*

Så kommer man til dette "bildet". Dette er bare en test så det er noen ting som ikke virker helt f.eks. Så kan man ikke skrive noe i tekstboksene men vi vil at du skal late som om du skriver noe. Det går heller ikke an å bruke videokontrollen som er plassert under videoen, men det dukker opp en oppå videoen som kan brukes til å spille av/pause.
Brukertest

- Du er misfornøyd med en frukt som har blitt plukket. Hva gjør du?
- Du er interessert i å se avokadoene som har blitt plukket. Hvordan gjør du det?
- Kan du forklare hva du tror skjer når du trykker på de ulike elementene?

Spørsmål om tillit og funksjon:

- Hva synes du om denne løsningen?
- Er det noe annet vi kunne ha lagt til i prototypen som kunne bidratt til at du ble mer fornøyd med varene?
- Ser du for deg at du ville brukt tid på å gi tilbakemeldinger med denne prototypen?

- Hvor viktig er det at den ansatte har god kunnskap om varene?
- Kommer det frem at den ansatte har kunnskap om varene?
    - På hvilken måte?
- Kommer det frem at den ansatte gjør en god jobb?
- Tror du at denne løsningen bidrar til at du får varer etter dine preferanser?
- Gjør løsningen at du stoler mer på at du får varer av god kvalitet?
    - Hvordan/hvorfor?

<u>Prototype Preference Feedback</u> 15min tot 40
Scenario: Ved bestilling av varer får du mulighet til å legge til kommentarer ved hvert produkt i kategorien "ferskvare". (*Vise frem skjermbilde av bestillingssiden)*
Etter at varene har blitt levert, mottar du en sms (vise sms).

Brukertest
Du er misfornøyd med bananen som du har mottatt. Hva gjør du?
Kan du forklare hva du tror skjer når du trykker på de ulike elementene?

Spørsmål om tillit:

- Hva synes du om denne løsningen?
- Er det noe annet vi kunne ha lagt til i løsningen som kunne bidratt til at du ble mer fornøyd med varene?
- Vil denne løsningen være nyttig for deg når du klager?
- Ser du for deg at du ville brukt tid på å gi tilbakemeldinger med denne prototypen?

- Gjør løsningen at du stoler mer på at du får varer som følger din preferanse?
- Gjør løsningen at du stoler mer på at du får varer av god kvalitet i fremtiden?
    - Hvordan/hvorfor?

Diskusjonsspørsmål

Nå som vi har gått gjennom begge løsningene,

- Hva er fordelene med video-løsningen?
- Og ulempene?
- Hva er fordelene med den siste løsningen?
- Hva er ulempene?
- Hvordan tenker du at den optimale løsningen kan være?

Evaluering 5min tot 45

- Er det noe du vil legge til som vi ikke spurte om?
- Har du noen spørsmål til oss?

"Takk for at du stilte opp" *gi gavekort*

Appendix I. Informed Consent Form

Informasjon og avtale om video/lyd-opptak

Om prosjektet

Vi er to masterstudenter, Kristoffer Holm og Aria Nejad, ved Institutt for Informatikk, Universitetet i Oslo. Prosjektet er i samarbeid med [redacted] og SINTEF, og har som tema tillit ved matvarehandel på nett. Du kan kontakte oss på e-post: ariash@ifi.uio.no dersom du har spørsmål.

Frivillig deltakelse

All deltagelse er frivillig, og du kan når som helst avslutte deltagelsen eller trekke tilbake informasjon som er gitt under intervjuet.

Retningslinjer for bruk av videoopptak, inkludert opptak av skjermbilde i [redacted] lokaler:

- Redigerte klipp / sitater inntil maksimalt 5 minutter kan lagres i sammenheng med prosjektdokumentasjon.
- Opptak som ikke er redigert vil slettes senest 3 mnd. etter prosjektets avslutning 14.06.2017.
- Opptak vil aldri bli vist eller lagt ut på offentlig tilgjengelige nettverk / nettsteder.
- Eventuell informasjon som måtte framkomme av en personlig art vil bli behandlet strengt konfidensielt, og anonymisert i prosjektdokumentasjonen. Dette gjelder informasjon om testdeltagers økonomi, personnummer og lignende.

Ved signatur gir deltager samtykke til at videoopptak vil bli gjort og [redacted] forplikter seg til å følge retningslinjene i denne avtalen.

Testleders underskrift:	Deltakers underskrift:
_____	_____
Sted/dato & underskrift	*Navn (blokkbokstaver)*

_____

Sted/dato & underskrift