

Motivating Generosity

Investigating Persuasive Strategies for Increasing
Clothing Donations to Charitable Causes

Arvid Andersson and Hannes Bjurström

DIVISION OF INNOVATION | DEPARTMENT OF DESIGN SCIENCES
FACULTY OF ENGINEERING LTH | LUND UNIVERSITY
2023

MASTER THESIS



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LUND
UNIVERSITY

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Published by

Department of Design Sciences
Faculty of Engineering LTH, Lund University
P.O. Box 118, SE-221 00 Lund, Sweden

Subject: Technical Design (MMKM10)

Supervisor: Johanna Persson

Co-supervisor: Daniel Hellström

Examiner: Per Kristav

Abstract

Today, the textile industry in Sweden is responsible for up to 1800 tons of textile waste per year, a poor use of resources that results in a negative environmental impact. Additionally, with the rise of fast fashion, which is characterized by rapid trend circulation and a clothing production that matches, clothes are discarded at a higher rate than ever before. However, the popularity of secondhand clothes shopping is steadily increasing among the Swedish population, especially younger individuals. This creates an opportunity for a service that connects key actors in the clothing industry: e-retailers, consumers and charitable organizations. Providing consumers with a service that facilitates and simplifies the donation process can increase their motivation to make charitable donations of clothes. Furthermore, connecting this service to established e-retailers and helping organizations can aid in moving Sweden towards a circular textile industry.

This report guides the reader through the development process of such a service, from data collection and analysis to discussion of the final prototype and research findings. Solutions to the donation service as well as methods of motivating users to donate clothes to charity are explored. A user centered approach was adopted, and a high-fidelity prototype of the service was developed, utilizing the Double Diamond and Fogg's Eight Step Design Process for Creating Persuasive Technologies as a framework for development work. The process builds on behavioral design principles and motivational aspects. Prototypes and research results are verified by a series of user tests.

With the development of this service, we hope to contribute to the circularity of Swedish fashion e-commerce by increasing the overall donations of clothes to charity, thus reducing textile waste, and connecting the key actors of the clothing industry.

Keywords: Persuasive Technology, Behavior Model, User Centered Design, Motivation, Encouraging Donation

Sammanfattning

Idag står textilindustrin i Sverige för upp till 1800-ton textilavfall per år, ett slöseri av resurser som resulterar i negativ miljöpåverkan. Med ökningen av företag som anammar fast fashion, som kännetecknas av snabb cirkulation av trender och en klädproduktion som matchar, slängs kläder i en högre takt än någonsin tidigare. Däremot ökar populariteten för att handla second hand-kläder stadigt bland den svenska befolkningen, särskilt yngre människor. Detta skapar möjlighet till en tjänst som knyter samman nyckelaktörer inom klädbranschen: e-handlare, konsumenter och välgörenhetsorganisationer. Att ge konsumenterna en tjänst som underlättar donationsprocessen kan öka deras motivation att donera kläder till välgörande ändamål. Att koppla denna tjänst till etablerade e-handlare och välgörenhetsorganisationer kan dessutom bidra till att vägleda Sverige till en cirkulär textilindustri.

Denna rapport guidar läsaren genom utvecklingsprocessen av en sådan tjänst, från datainsamling och analys till diskussion av den slutgiltiga prototypen och forskningsresultaten. Olika lösningar på donationstjänsten, samt metoder för att motivera användare att donera kläder till välgörenhet utforskas. Ett användarcentrerat arbetssätt användes och en high fidelity-prototyp av tjänsten utvecklades, med användning av Double Diamond-metoden och Foggs Eight Step Process som ett ramverk för utvecklingsarbetet. Processen bygger på beteendedesignprinciper och motiverande aspekter. Prototyper och forskningsresultat verifieras genom flera användartester.

Med utvecklingen av denna tjänst hoppas vi kunna bidra till cirkularitet inom den svenska modehandeln, genom att öka de totala donationerna av kläder till välgörande ändamål. På så sätt kan textilavfallet minska, och en koppling skapas mellan några av klädbranschens nyckelaktörer.

Nyckelord: Uppmanade teknologi, beteendemodell, användarcentrerad design, motivation, främja donation.

Acknowledgments

First and foremost, we would like to thank all the people who participated in our user tests: your engagement in our project led to invaluable insights, and we always left our test sessions with a plethora of new ideas and fixes stemming from your feedback. This project would have been impossible without you, something we hope the report makes clear.

We would also like to extend our deepest gratitude towards Johanna Persson, who supervised this project. Your expertise provided the help we needed to see the project through, and your genuine care shone through in all our meetings and conversations. We could not have asked for a better supervisor.

Thank you to Daniel Hellström, who provided the idea and sparked our interest in the project. Your infectious enthusiasm for the idea and great well of knowledge made us eager to take the project on, leading to the report you see before you today.

Lund, August 2023

Arvid Andersson and Hannes Bjurström

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1 Introduction

In this section, the work done in this master thesis project is put into context by introducing relevant work done previously. The aim and objective of the project is also introduced, along with the conditions and assumptions that frame the project.

1.1 Background

Clothing is currently not treated as a recyclable resource. Globally only 1% of discarded textiles are recycled into new ones, with the rest being either landfilled or incinerated, releasing toxins and greenhouse gasses into the atmosphere. Every year in the EU roughly 11 kg of textiles are discarded per citizen. All the while new trends are coming and going faster than ever, resulting in the current fast fashion clothing industry, focusing on producing cheap and low-quality clothing with short lifespans (European Union, 2022).

Fortunately, there are forces working to change the perception of clothing as a consumable product. The European Union (2022) has recently proposed changes that will force companies to be more transparent about the amount of clothing they discard, as well as introducing requirements that will increase the lifespan of clothes. Buying products second hand has seen a drastic increase in Sweden the last few years, giving clothes a second chance when their previous owner no longer wants them (Enström, 2023).

In light of these changes in the perception of clothing, a master thesis was conducted at Lund University in 2022. *Towards Circularity in Fashion E-commerce (2022)*, written by Maria Hallgren and Alfhild Hedelin, introduced a new business model that would connect charities working with recycling and reusing clothing, e-retailers that sell clothes online, as well as the customers who buy from them. The results of the master thesis showed that all three groups found the business model to be enticing, and that more work should be conducted to implement the business model into a working service called *PassOnLine*.

The service described by Hallgren & Hedelin (2022) is meant to encourage consumers to donate clothing in conjunction with the purchase of new clothes from an e-retailer. The service consists of the following steps for the user:

1. The user purchases clothing from an e-retailer.
2. The user receives their package containing their new clothing.
3. The user chooses what clothing to donate and reuses their package, packing the clothes they wish to donate into it.
4. Using an interactive interface, the user chooses what charity to donate their clothing to.
5. The user goes to a post office and sends their clothing to the chosen charity.
6. Using an interactive interface, the user receives feedback on their donation.

1.2 Objective

The aim of this master thesis project was to build on the work done by Hallgren and Hedelin, by exploring interactive solutions that implement the PassOnLine service.

The objective was to develop a high-fidelity prototype of an interactive interface, that allows the user to donate items of clothing to a charity of their choice in conjunction with a purchase from an e-retailer. Additionally, research on suitable behavioral and persuasive methods for motivating users to donate clothing to charity was to be conducted.

Hallgren & Hedelin (2022) established three stakeholders for PassOnLine: the customers, the charities, and the e-retailers. For a viable business model, the authors advocated that value should be created for each stakeholder. Thus, our objective also included implementing functions that cater to all the stakeholders' needs in the product.

1.3 Conditions

The limited time available for the master thesis project put certain limitations on the project's scope. Therefore, it was decided that the thesis project would primarily cover the interaction between customer and interface, since creating multiple interfaces to cater to each stakeholder would be very time consuming and

probably detrimental to the quality of each interface. However, care was still taken to ensure that value was created for all stakeholders of the project.

As the project concerned the consumption habits of the Swedish population, all the surveys and user tests conducted, as well as the prototypes, were written in Swedish. This choice was made to make data collection and user testing easier with native Swedish speakers.

Finally, questions regarding financing, marketing, confidentiality, and logistics were decided to be beyond the scope of this project. These subjects are however discussed in [section 7](#).

2 Methods

In this section, the methods and frameworks used in this project are presented. The Double Diamond method and Fogg's Eight Step Process for Designing a Persuasive Technology are described, being the general framework for the entire project. More specific methods used for development, prototyping, and evaluating are also presented.

2.1 Fogg's Eight Step Process for Designing a Persuasive Technology

BJ Fogg's eight step process for designing a persuasive technology (from here on referred to as FESP) was used as the main method for the development process. Fogg (2009b) describes a framework for the early stages of designing a persuasive technology. As the title suggests, FESP consists of eight steps:

1. *Choose a simple behavior to target.* The goal should be rather easily achieved by anybody with measurable success. Fogg means that achieving a small goal can have bigger effects than expected, and smaller goals can oftentimes be an approximation of a large objective.
2. *Choose a receptive audience.* To maximize success rate, designers should choose a target audience with a high probability of adopting the desired behavior change. For example, if the design team is developing a persuasive technology with the goal of encouraging users to adopt better eating habits, they should select an audience that has shown a desire to improve their diets.
3. *Find what prevents the target behavior.* Fogg means that the reason the behavior is not performed falls into one or more of three categories: lack of motivation, lack of ability, and lack of a well-timed trigger to perform the behavior.
4. *Choose a familiar technology channel.* Choosing a suitable technology channel is largely based on the previous three steps of the process. An unfamiliar technology channel places unnecessary cognitive load on the user and can be distracting from the main purpose of changing the target behavior. Additionally, the technology channel should be chosen in regard to what prevents the target behavior. Some technology channels are

efficient in motivating the user and some are better at facilitating ability. etc.

5. *Find relevant examples of persuasive technology.* Designers should look for examples of successful technologies relevant to their work. However, it is rare to find an example that is a precise match to the target audience, behavior and technology channel. Therefore, Fogg encourages designers to examine different successful persuasive technologies that either reaches a similar audience, targets a similar behavior or uses the same technology channel as the product in development.
6. *Imitate successful examples.* At this stage, the team should not refrain from copying certain functions that have been proven to work. Fogg means that there is a benefit to laying a solid foundation in order to facilitate innovation in later stages.
7. *Test and iterate quickly.* Frequently test the prototypes on users. These small tests are not intended to be scientific experiments, but rather to quickly learn about persuasion in the chosen field.
8. *Expand on success.* The final step of FESP is expanding on success. Scaling up the project can be done in several ways. For example, changing the target behavior to something more ambitious or attempting to reach a broader target audience. The expansion should be systematic and only vary one of the successful aspects at a time.

2.2 The Double Diamond

The design process followed the Double Diamond method, as a complement to FESP. This method has four phases which are intended to be worked with iteratively. The framework is illustrated as two diamonds, where the first half of each diamond represents exploratory work and broadening the designers' mindset, while the second half corresponds with narrowing the focus (Sharp et al., 2019, 38). The Double Diamond can be seen in Figure 2.1 below.

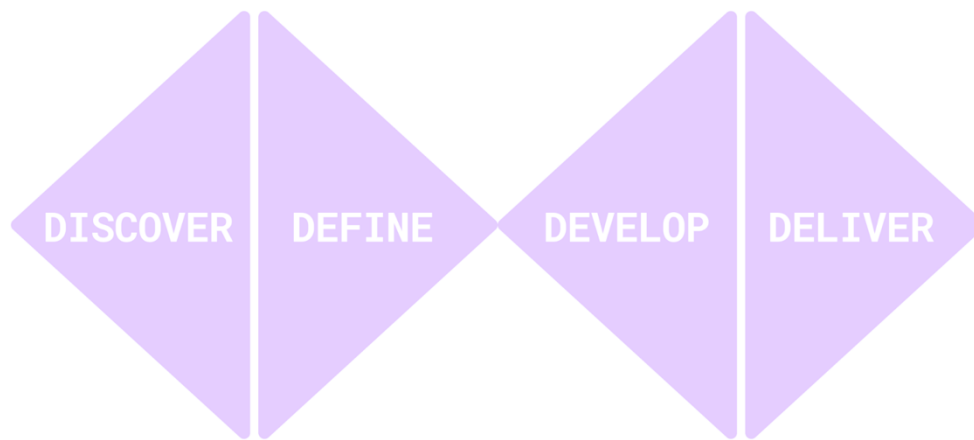


Figure 2.1. The Double Diamond of design.

Discover includes gathering insights about the design problem. During the *Define* phase, the designers establish a clear brief that frames the design challenge. *Develop* refers to the creation of potential solutions or concepts. It also includes testing, evaluating, and iterating. The final phase is *Deliver*, which is constituted by finalizing the product (Sharp et al., 2019, 38).

The Double Diamond is also used to structure this report, and each step will be explained further under its corresponding heading.

2.3 User-Centered Approach

A user-centered approach was used during the Develop and Deliver phases of the Double Diamond. Conducting a design process according to a user-centered approach, coined by Gould & Lewis (1985), means following three core tenets.

1. Designers should involve users early in the design process, meaning that the users get to test and evaluate prototypes and shape the direction of the process.
2. Designers should perform empirical measurements on the tests performed, resulting in quantitative data that can be analyzed and inform future design decisions.
3. The design process should be iterative, meaning that problems discovered during user testing should be acted upon in the next iteration of the design, which will be tested and evaluated in the same manner.

As shown in Figure 2.2, using the user-centered approach creates an iterative loop of prototyping, testing, and evaluating. Each lap around the loop leads to the creation of a new iteration, where all the insights from the previous iteration are considered when making design decisions.

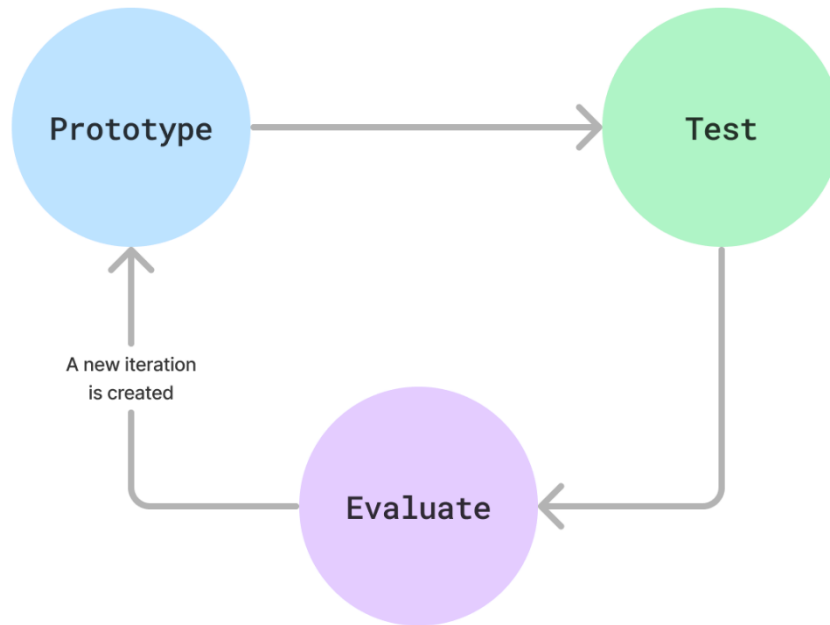


Figure 2.2. The iterative design loop.

2.3.1 Prototyping

According to Sharp et al. (2019, 422), the definition of a prototype is:

“A manifestation of a design that allows stakeholders to interact with it.”

The definition means that a prototype can simulate the experience of using a proposed product without having a finished design. Prototyping is therefore used to both express ideas between team members, and to test ideas on stakeholders (Sharp et al., 2019, 424). Stakeholders in this context means every person or corporation who is affected by the creation of the service, including users (Sharp et al., 2019, 56).

Prototypes are generally divided into two categories: low-fidelity (lo-fi) and high-fidelity (hi-fi). A lo-fi prototype is generally quick and easy to produce, often done on paper or other physical media. It does not have the same look and feel as the finished product is meant to have, instead focusing on testing a small part of the design (Sharp et al., 2019, 426).

In this project the lo-fi prototypes took the form of paper prototypes.

A hi-fi prototype resembles the final product more than a lo-fi prototype and generally contains more functions. High-fidelity prototypes often have practically complete functionality, with the look and feel of the intended product. As high-fidelity prototypes are more time consuming and require more resources to modify, it is beneficial to use low fidelity prototypes for initial development work and proof of concepts (Sharp et al., 2019, pp. 428-431).

In this project the hi-fi prototypes took the form of Figma-projects, an SDK (standing for Software Development Kit) which allowed us to create digital prototypes of user interfaces.

2.3.2 User Testing

Multiple techniques were used to perform user testing, described below.

2.3.2.1 Questionnaires

Online questionnaires were used to gather data because of their simplicity: once a questionnaire has been constructed and sent out it requires no more work to collect data (Sharp et al., 2019, 278). We used Google Forms to construct our questionnaires, which compiled answers into spreadsheets that could then be analyzed.

2.3.2.2 Observations

During the design process, prototypes were regularly tested on test participants to ensure that they were functional and easy to use. These tests consisted of the user performing a given task while we observed. Each participant was asked to externalize their thoughts during the test, explaining what they thought and what they wanted to do every step they took. The *think-aloud technique* is effective as it

removes guesswork from the testing: the participants simply say what parts make them confused or when they misunderstand something (Nielsen, 2012).

2.3.2.3 Interviews

After participants had performed their given test we held interviews with them, to find any information that could not be inferred from the observation. These took the form of semi-structured interviews, which Sharp et al. (2019, 269) describe as having the same script of questions for each participant while allowing the interviewer to probe for more information with further questions.

2.3.3 Evaluation

The data collected from the user testing had to be evaluated, to gain insight into what design changes should be made to improve the prototypes. Evaluation consists of deciding upon dependent and independent variables. A dependent variable is something that can be observed while a participant performs a test, e.g. the time it takes them to complete it, or the number of errors they make while completing the given task. Independent variables are things we as researchers manipulate, e.g. what user interface the user is presented with, or what the task is (Sharp et al., 2019, 533).

The same dependent variables were used over multiple prototypes to gauge the progress of the project. For example, the later prototypes in the projects had more complex tasks but fewer errors, which we interpreted as the prototypes being easier for the user to understand.

2.4 Scrum and Sprints

For the iterative process of prototyping, testing and evaluating the interface, the Scrum-method was adopted. This method uses a framework of so-called sprints, short periods of time where a set amount of work is achieved. At the beginning of each sprint a goal is set, e.g. a function that should be implemented. At the end of the sprint the goal is revisited to see if it was achieved, and then the next sprint is started immediately (Schwaber, n.d.).

Scrum was chosen as a method since it complements FESP and the User-Centered Approach well, making it easier to do quick iterations and frequent user testing in the sprints-framework.

2.5 Overview of Methods

Figure 2.3 shows the methods used during the project, and where in the Double Diamond framework they are used. The methods not yet described are explained in the sections where they are introduced.

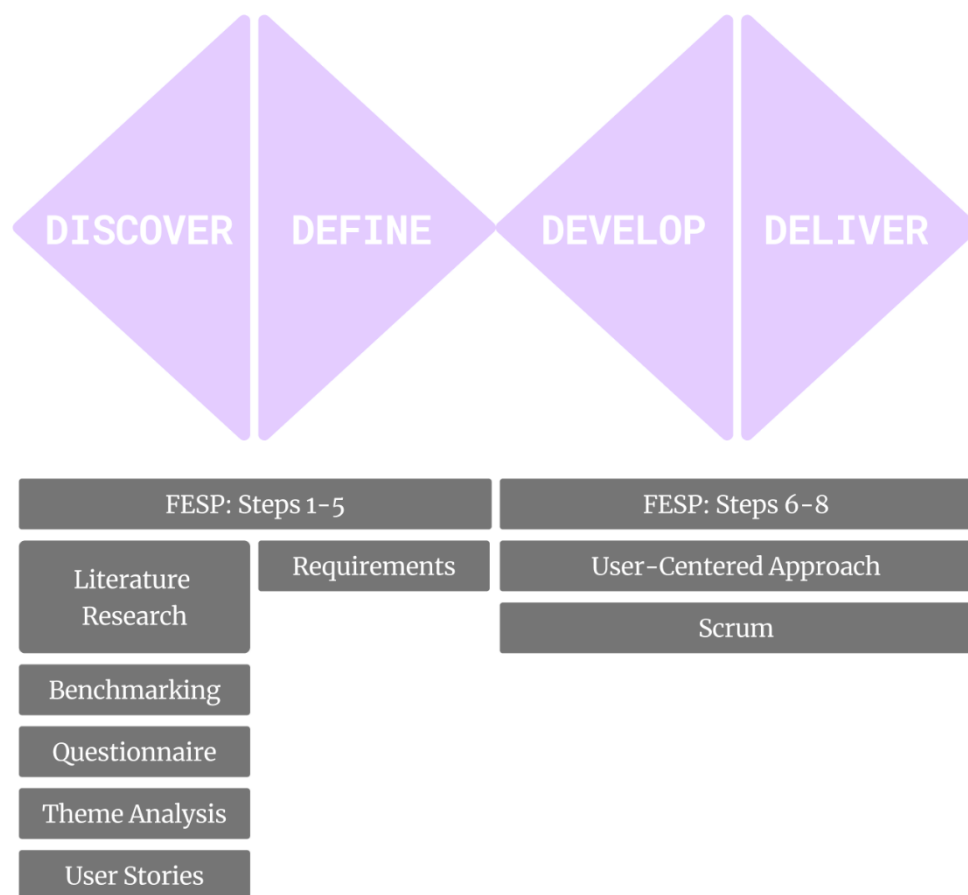


Figure 2.3. Overview of methods used.

3 Discover

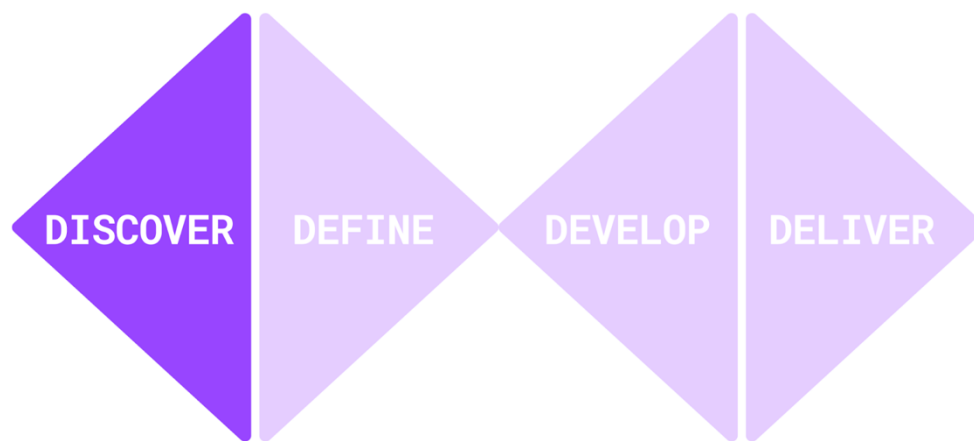


Figure 3.1. The Discover phase of the Double Diamond.

Discover is the first step in the Double Diamond framework. It includes exploring the design problem and broadening one's mindset on possible solutions. This phase began with a thorough literature research on relevant fields as well as benchmarking existing similar products, which corresponds to step five in FESP. In this section we also established general design guidelines for designing an interactive interface. The discover-phase was concluded with data collection and data analysis on potential user themes and establishing the behavior to target and what prevents, in accordance with the first and third step of FESP.

3.1 Literature Research

An extensive literature research was conducted to prepare for the development of the first prototype. Scientific fields of behavioral models, motivation, nudging, and persuasive technologies were examined. Key takeaways from the literature research were what elements designers can manipulate to change the behaviour of the target demographic, a set of nudges and motivational aspects that have proven to be effective in motivating users, as well as what type of motivation was most suited for a donation service.

3.1.1 Behaviour Models

A renowned expert in the field of persuasive technology is BJ Fogg at Stanford University. Fogg (2009a) proposes a behavior model called the Fogg Behavior Model (FBM) that can be used when designing an interface for influencing user behavior. According to Fogg, one can induce behavioral change in a user by manipulating one of three key elements: motivation, ability, and triggers. This also refers to the third step in FESP, i.e. find what prevents the target behavior, which includes identifying which of these key elements are lacking to perform the desired behavior.

Motivation refers to the user's willingness to perform a certain behavior. Fogg (2009a) identifies three types:

1. *Sensation* – Motivation stemming from pleasure or pain, e.g. eating a delicious meal, or going to the doctor for a stomach ache.
2. *Anticipation* – Motivation stemming from the promise of a future reward, e.g. working for a future paycheck.
3. *Belonging* – Motivation stemming from a desire to belong to a group or community, e.g. learning a language to connect with new people.

Fogg (2009a) describes three abilities people must have to perform the desired behavior:

1. *Physical* – Physical abilities may include being able to speak if the behavior requires it.
2. *Cognitive* – Cognitive abilities may include skill with computers if the behavior requires interacting with an application.
3. *Emotional* – Emotional abilities may include a positive disposition to the desired behavior.

Finally, Fogg (2009a) describes triggers as prompts that promote a behavior. He formulates three types:

1. *Spark* – A trigger that introduces the behavior, e.g. an advertisement for a new movie increasing the chances for someone to go see it.
2. *Facilitator* – A trigger that simplifies the act of performing the behavior, e.g. having an app making it easier to buy a movie ticket.
3. *Signal* – A trigger that reminding someone to perform the behavior, e.g. getting advertisements for future movies in the application.

Fogg (2009a) argues that for a behavioral change to occur, at least one of the elements motivation, ability, and trigger must be present. He divides the likelihood of a user's behavior to be influenced into three zones: the green zone, the yellow zone, and the red zone. In the green zone, all the key elements are present, making behavioral change likely. The yellow zone is characterized by one or two elements being inadequate, making behavioral change more difficult. The red zone, where motivation, ability and trigger are all low, behavior change is very unlikely. Fogg (2009a) advocates that this model can be utilized by designers through focusing on increasing the presence of the three elements of users. Increasing motivation, enhancing ability, and implementing effective triggers can incrementally lead to the user adopting the desired behavior.

3.1.2 Motivation

Motivation is commonly divided into two types: *intrinsic* and *extrinsic* motivation. Intrinsic motivation refers to engagement in behavior that is inherently satisfying or enjoyable. It is not dependent on any outcome or reward. On the other hand, extrinsic motivation refers to a behavior that is fundamentally contingent on an outcome that is separable from the action itself. It is a behavior that is entirely dependent on attaining something (Legault 2016).

Studies have shown that extrinsic motivation can have an undermining effect on intrinsic motivation. If an individual engages in an activity out of interest and is subsequently offered an external reward (in other words, extrinsic motivation), the intrinsic motivation towards the activity declines (Legault 2016). Furthermore, using external rewards to motivate people decreases the probability of a long-lasting intrinsic motivation of genuine interest and enjoyment.

However, if the behavior is not inherently intrinsically motivating, i.e fun, interesting or challenging, there is little incentive to engage unless incentives are presented. That is, unless extrinsic motivation is available. Not all extrinsic motivation is the same, and some forms are more self-determined. Legault et al. (2007) presents four different types of extrinsic motivation, ranging from most to least external. *External regulation* refers to a behavior that is mostly controlled via external factors such as deadlines, rewards etc. *Introjected regulation* is when the external motivation has been partially directed inwards. *Identified regulation* is described by Legault as a more autonomous form of extrinsic motivation, where the behavior becomes self-endorsed. Finally, *integrated regulation* refers to behavior where the behavior is integrated with the person's own beliefs. Even though the behavior is at this point highly internalized, Legault argues that it is extrinsic motivation as the drive to engage is not due to enjoyment or interest.

Intrinsic motivation has shown to be related to gaining and retaining donors. A study by Gorczyca & Hartman (2017) has shown a positive correlation between millennials' intrinsic motivation and their intent to donate as well as attitudes towards charitable organizations. With that, it is best to strive to motivate people intrinsically to engage people to donate and form longer lasting donation behaviors. Considering Legault's definition of extrinsic motivation types, more internalized extrinsic regulations can also be implemented, should intrinsic motivation prove too challenging.

3.1.3 Nudging

Nudging is a term that refers to encouraging or persuading someone into doing something in a gentle manner, rather than being forceful and direct (Cambridge, 2023). These nudges can be applied to an interactive interface to induce behavioral change in a subject.

Thaler & Sunsteins' book "*Nudge: Improving Decisions About Health, Wealth, and Happiness*" (2009) describes multiple heuristics, focusing on psychological aspects of the human mind, that can be used when implementing nudges. These include *conforming*, referring to a person's need for affirmation and fear of isolation, as well as *temptation*, referring to a person's attraction to short-term rewards. These heuristics were used in the development of persuasive versions in Sprint 4 (see [section 5.5](#))

A study made by Goswami & Urminsky (2016) of a pre-selected choice architecture, i.e. default options being selected without user input, shows that the donation amount as well as the number of choices presented influences the donated sum. The "lower bar" effect invites people to donate larger amounts due to the positive reactions to the low default amount, thus motivating them to donate. However, study also indicates that low default amounts can lead to reduced donation amounts due to the so-called "scale-back" effect, which is counteracting to the "lower-bar" effect. This indicates that the effect of default amount is situational and should be tested if applied to an interface. Additionally, the study indicates a "default-distraction" effect, which made participants of the study less susceptible to other cues like positive views of the charity when a default choice architecture was present.

More experiments have been conducted with the goal of examining the effects of the choices presented when making charitable donations. A study made by Schulz et al. (2018) tested the effect of two different choice architectures: the subjects

could either specify the charity of their choice or select one from a list of well-known charities. They found that providing a list of default charities doubled the number of donors as well as the overall revenue generated for the charities.

Moral nudges, i.e. nudges that play on emotions, can improve a person's willingness to partake in pro-social behavior and promote cooperation. A study by Capraro et al. (2019), which consists of five separate experiments, has shown that implementing moral nudges has an impact on users' altruistic as well as cooperative behavior. The third experiment conducted by Capraro et al. (2019) investigates the lasting effects of moral nudges, i.e if it only affects the choice immediately after the nudge or persists to a subsequent interaction. They found that the positive impact of moral nudges persists to at least one additional choice. The fourth study showed that these moral nudges also spill over into other contexts. A moral nudge to increase altruism in one interaction promotes cooperation in another. Finally, the fifth study verified that moral nudges can be successful in increasing charitable donations.

3.1.4 Persuasive Technologies

A persuasive technology is designed to change attitudes and behaviors of users, with enticing or nudging techniques (Sharp et al., 2019, 182). By researching current persuasive technology design principles and methods we found certain aspects that are applicable to a charity donation application.

In the article "*A Study of Donation-Based Crowd Funding Platforms*", the author Mane (2022) presents a study of different factors of web-based crowdfunding platforms that influence the visitors' donation intention and behavior. They found that mainly different strategies of persuasion and a social networking presence had the largest impact on donation intention. Additionally, the overall quality of the website as well as trust and privacy aspects have a positive correlation with the visitor's willingness to donate.

3.2 Benchmarking

Prior to developing the first iteration of the prototype, market research was conducted. Three types of interfaces were examined; charity donation applications where the user is allowed and encouraged to donate, secondhand clothing marketplaces where users can buy and sell their clothes, as well as social media

applications. These types of interfaces were explored for inspiration and benchmarking purposes.

3.2.1 Charity Applications

ShareTheMeal is a smartphone application created by the United Nations World Food Programme that allows the user to donate to their overarching cause; to end world hunger (ShareTheMeal, n.d.). The user can choose a fundraising goal or cause that matters to them and donate either with a one-time transaction or a monthly subscription. See Figure 3.2 for examples of the user interface.

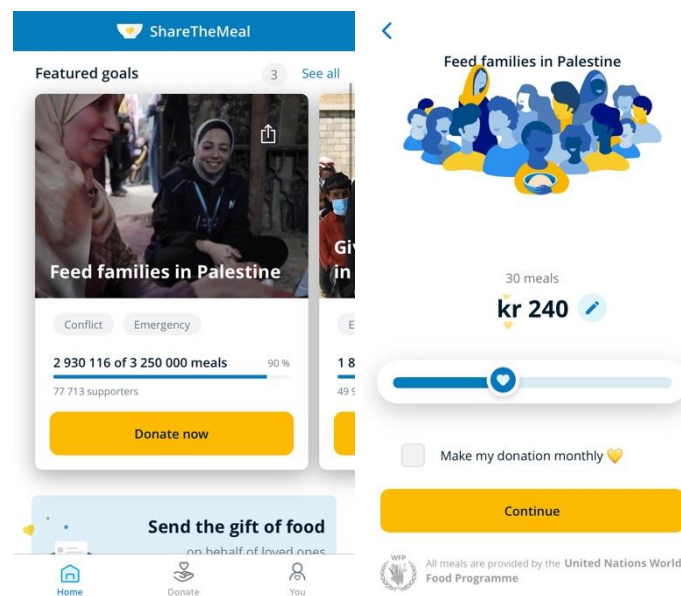


Figure 3.2. The user interface of ShareTheMeal.

ShareTheMeal's user interface was used as inspiration because it invites the user to donate with simplicity, requiring only a few taps. It also effectively presents information about the people the World Food Programme is helping.

Another charity application that was used as inspiration is Milkywire, a tech platform enabling charities and grassroots organizations to reach out to a bigger audience (Milkywire, n.d.). It is a service that is offered as a mobile application or in a web browser and allows the user to choose an environmental cause or

organization of their liking to support. Milkywire was used as general inspiration on how to display information about charitable work to the user (see Figure 3.3).

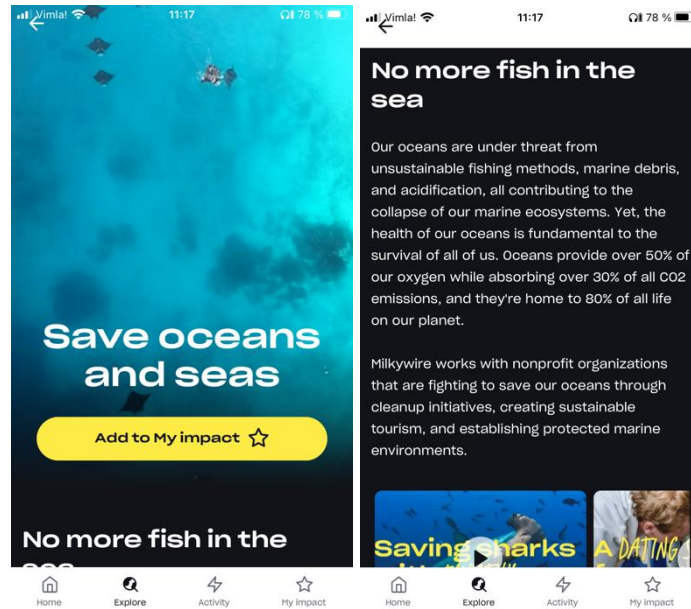


Figure 3.3. The user interface of Milywire.

3.2.2 Secondhand Marketplace Applications

Grailed, DePop and Vinted are all digital marketplace platforms where the user can buy and sell items of clothing. The applications are merely mediators between buyer and seller and the users themselves create listings and handle negotiations. These marketplace applications were mainly examined for the process of listing an item of clothing for sale, with the purpose of inspiring the donation procedure or our interface (see Figure 3.4).

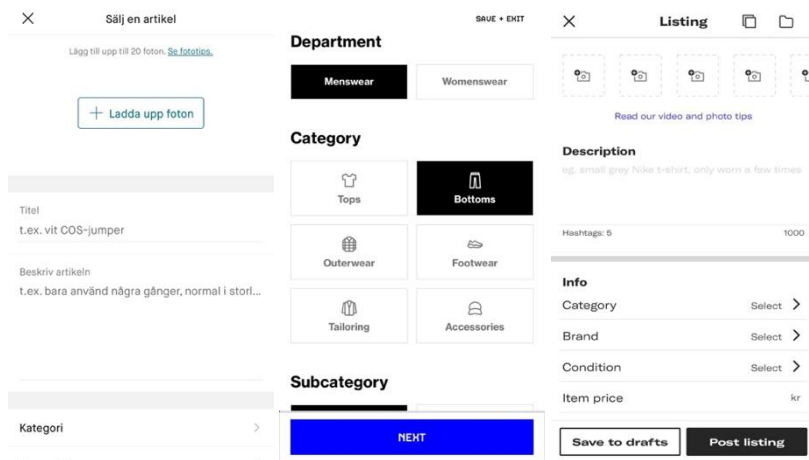


Figure 3.4. The user interface for creating a listing on Vinted, Grailed, and Depop respectively.

3.2.3 Social Media Platforms

In addition to these types of applications, other common social media platforms such as Instagram and Facebook were examined for general design inspiration (see Figure 3.5).

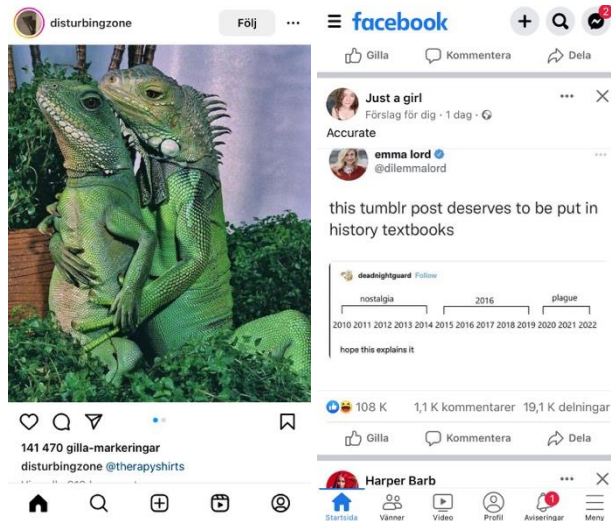


Figure 3.5. The user interface of Instagram and Facebook.

3.3 Design Guidelines

Two different types of design guidelines were used as inspiration for this project: Nielsen's 10 heuristics provide guidance on *what to implement* for a good user experience, while dark patterns provide examples of *what to avoid*.

3.3.1 Nielsen's 10 Heuristics

Jakob Nielsen's (2020) ten usability heuristics serve as general design principles for interactive interfaces. These principles were considered throughout the whole design process. The usability heuristics are as follows:

1. *Visibility of system status* - The system should be designed in such a way that the user always knows what is going on and the outcome of their prior actions.
2. *Match between system and real world* - The design should include words, phrases and concepts that are familiar to the user. Following real world conventions makes for a logical and natural interface.
3. *User control and freedom* - The user should always be allowed to leave an unwanted action, thus remaining in control of the system and not the other way around.
4. *Consistency and standards* - To ensure that the user understands what words and situations mean the same thing, the designers should follow platform and industry conventions.
5. *Error prevention* - The design should prevent errors from occurring, not only provide good error messages. Confirmation options and removing error-prone conditions are necessary.
6. *Recognition rather than recall* - Making elements, actions and options reduces the load on the user's memory and thus reduces the amount of cognitive effort needed.
7. *Flexibility and efficiency of use* - The system should be tailored to both inexperienced and experienced users, by allowing them to tailor frequent actions.
8. *Aesthetic and minimalist design* - Interfaces should not contain information that is irrelevant or rarely needed. Keeping the design focused on the essentials is key.
9. *Help users recognize, diagnose, and recover from errors* - Include error messages that are precise and offer a solution to the problem.
10. *Help and documentation* - If necessary, provide the user with the option to document and help them understand how to complete their tasks.

3.3.2 Dark Patterns

Nudging is a tool that can be used to induce behavioral change in a user through in a discrete and gentle manner. However, if used excessively it can become a dark pattern, making the user do something they did not intend (Deceptive Patterns, n.d.a). It is important to ensure the user feels the service is trustworthy, so they can feel confident and comfortable while using it. Below is a number of dark patterns we wanted to avoid while designing a persuasive interface, gathered from the online resource Deceptive Patterns (n.d.b):

1. *Nagging* - The user is interrupted when trying to perform an action by requests to do something else that may not be in their best interest.
2. *Fake urgency* - The user is presented with a fake time limit to pressure them into completing a task.
3. *Confirmshaming* - The user is manipulated into doing something that they would not otherwise have done.
4. *Trick wording* - The user is misled to perform an action through confusing or misleading language.

3.4 User Research

User research was needed to complete step two, three, and four in FESP: choosing a receptive audience, choosing a familiar technology channel, and finding out what prevents the intended target behavior.

3.4.1 Questionnaire

An online questionnaire was constructed to analyze potential users' online shopping habits. The purpose of this survey was to find suitable technology channels for the service as well as determining the target audience and their shopping and return habits. Since online shopping is a prerequisite to use the service, it was beneficial to know what the demographic of online shoppers are and by what technological means they access online stores.

After receiving 118 responses, the results of the survey showed that around half of the participants who shop online were in the ages 18 to 29 years old, and that more than two thirds of the participants were women. It was also found that a majority of the participants used their smartphone or a tablet to conduct their online shopping. This information allowed us to formalize a target audience and a fitting technology channel: people between the ages of 18 to 29 who do their shopping on their phone. See Figure 3.6, Figure 3.7, and Figure 3.8 for more information.

Age of participants

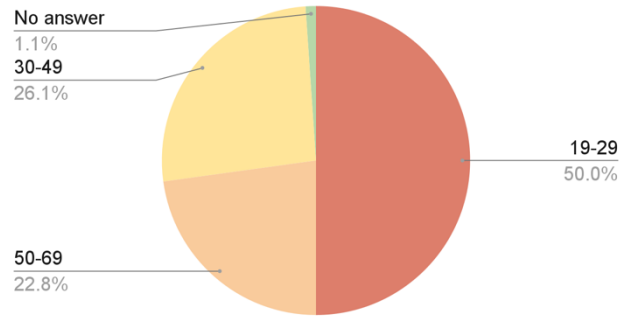


Figure 3.6. Pie chart of participants' age.

Gender of participants

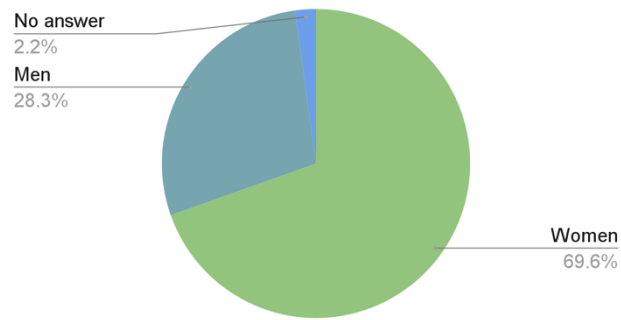


Figure 3.7. Pie chart of the participants' gender.

Preferred technology used when shopping

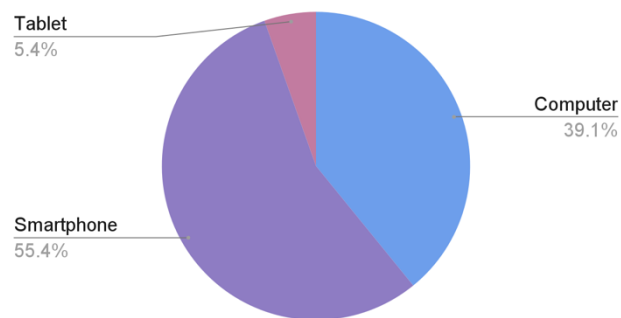


Figure 3.8. Pie chart of preferred technology channel when shopping online.

3.4.2 Data Analysis of the Previous Master Thesis

The authors of “*Towards Circularity in Fashion E-commerce*”, Hallgren & Hedelin, conducted an extensive qualitative data research of e-retailers, potential users of the service, and charities. The data collection resulted in 328 pages of transcribed recordings from interviews with charities, e-retailers, and user focus groups. Although the objective of the previous master thesis differed from that of this project, being focused on gauging the interest and validity of the service instead of developing an application, the data was deemed relevant and was analyzed with an interaction design approach. The collected data was used to derive requirements that the application was to fulfill, as well as identifying what prevents the target audience from performing desired behavior of donating clothes to charity.

3.4.3 Identifying Themes

The qualitative data analysis began with identifying themes. Themes are patterns in the data that are important or relevant in relation to the study goal. A theme can be a reoccurring statement from a respondent, for example feeling shame when shopping online (Sharp et al., 2019, 322).

To identify and categorize themes from the data, inductive analysis was used. It is a form of analysis where themes are not formulated before looking at the data but emerge from the data itself, without preconceptions from the designers (Sharp et al., 2019, 324). It was chosen as the form of analysis to make sure that every design decision taken was bound to the data of potential users, instead of being based on preconceptions we as designers may have about the product. However, it is important to note that theme analysis is subjective: quotes can be interpreted in a variety of ways and are always dependent on the person who is doing the analysis. It is however a useful tool for identifying patterns in data and was therefore chosen as the technique for analysis.

Statements and opinions of interest were arranged into potential themes until all the data was processed. The themes were arranged into seven categories: *ease of use*, *feedback*, *trustworthy information*, *motivation*, *positive feelings*, *better brand image*, and *improved logistics*. The number of themes and how often they were mentioned determined the importance of each category. For example, as seen in Figure 3.9, three quotes were grouped together and implied the theme “*Feedback that the clothes go to a good cause*”.

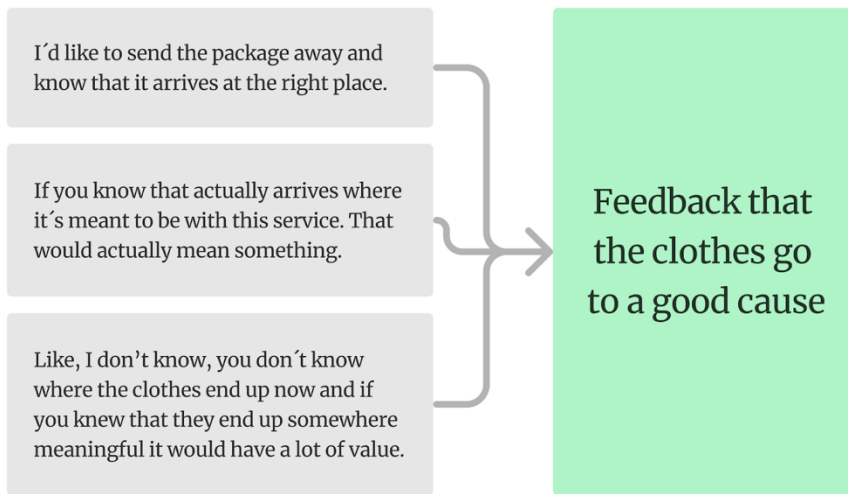


Figure 3.9. Quotes from users, and the theme that was derived from them.

The theme was then grouped together with similar themes into a larger category, as can be seen in Figure 3.10. For instance, the theme “*Feedback that the clothes go to a good cause*” was grouped together with other themes under the encompassing category “*Feedback*”.

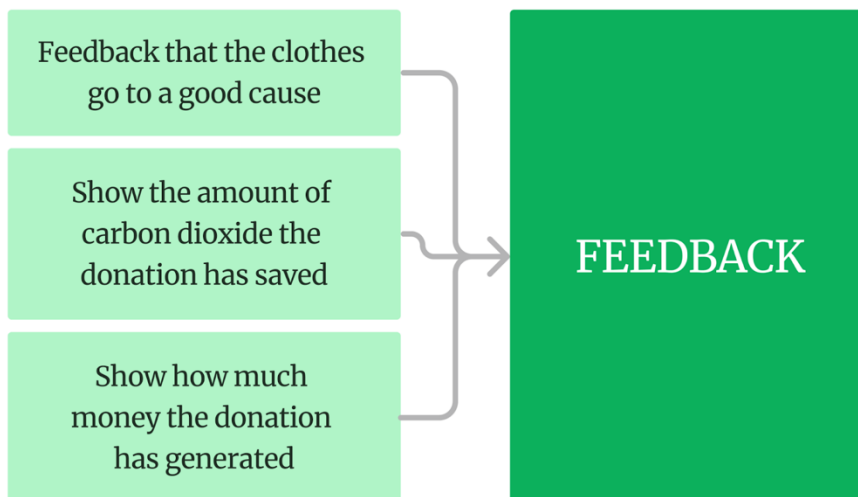


Figure 3.10. Themes grouped together into the overall category “Feedback”. The category contained more themes than shown here.

Theme analysis was conducted on all the data collected by the authors of the previous master thesis. The data consisted of five interviews with focus groups of potential users, five interviews with representatives from four different e-retailers, and three interviews with representatives from three different charity organizations. The results from the data analysis are shown in the following sections.

3.4.3.1 User Themes and Categories

It was apparent from the data that potential users want a service that is *easy to use*, as it was the category with the most statements. The other categories seemed to be of approximate equal importance, with *positive feelings* and *motivation* being mentioned slightly more often (see Figure 3.10).

Examples of interesting themes that emerged were the sentiment that the service should not encourage over consumption, with nine statements, and that there should not be a need to print a shipping label to use the service, with six statements. Another prevalent theme was that the service should be integrated at the check out of an e-retailer, with seven statements.

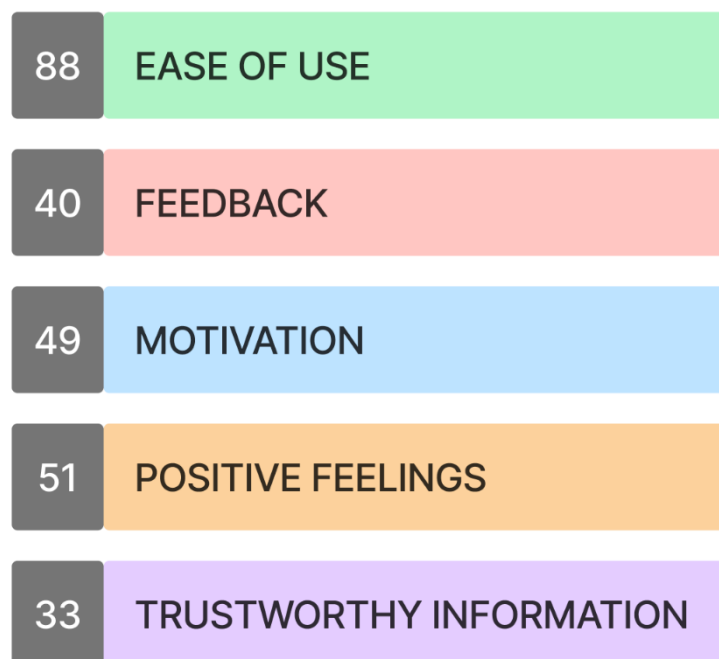


Figure 3.11. The results of theme analysis on the data from the focus groups. The number of statements is on the left and its corresponding category is on the right.

3.4.3.2 E-Retailer Themes and Categories

The most relevant categories for e-retailers were *ease of use*, *trustworthy information*, and *brand image*, which was the most important category. Examples of interesting themes were that the service should not encourage over consumption, mentioned eleven times, and that the service should promote trust in its user base, mentioned five times (see Figure 3.12).

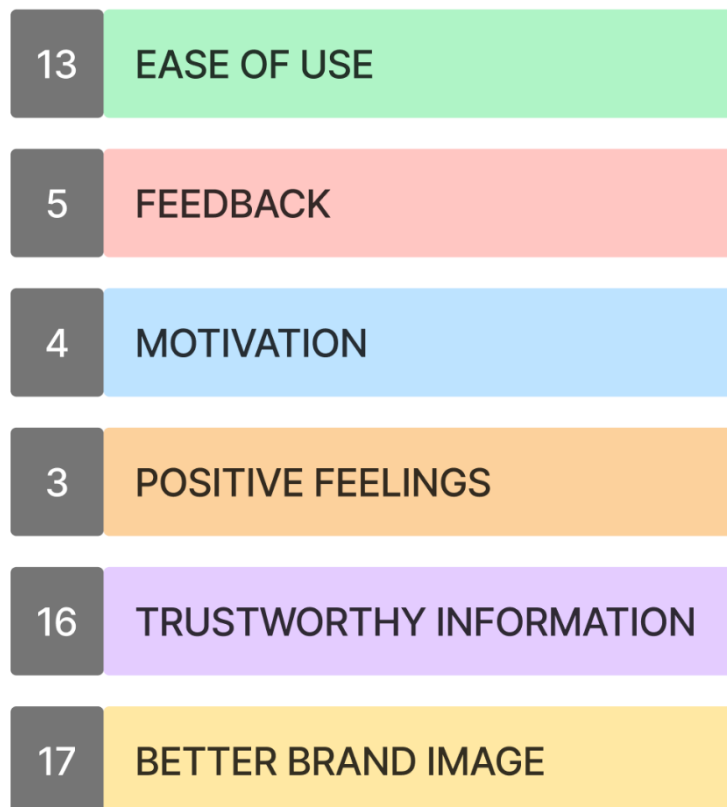


Figure 3.12. The result of theme analysis on the data from e-retailers. The number of statements is on the left and its corresponding category is on the right.

3.4.3.3 Help-Organization Themes and Categories

The most prevalent categories for the charities interviewed were *improved logistics*, *ease of use*, and *trustworthy information*. The charities were mostly interested in making the sorting of clothes easier, mentioned eight times, and to control the inflow of clothes, mentioned six times. They also wanted a way to communicate to the user what garments are needed and valuable as donations, mentioned five times (see Figure 3.13).

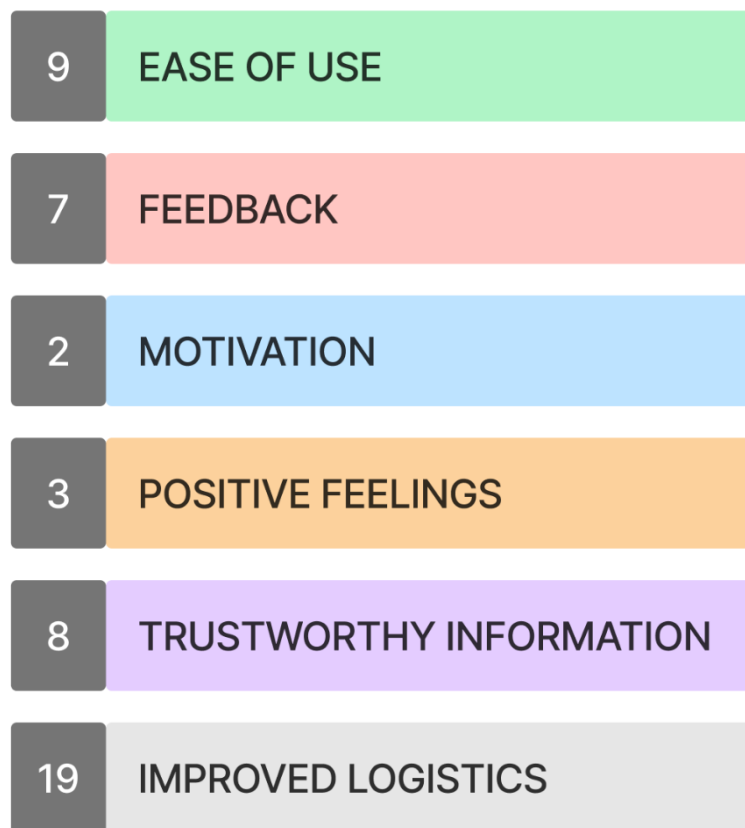


Figure 3.13. The result of theme analysis on the data from charities. The number of statements is on the left and its corresponding category is on the right.

3.4.4 User Stories

User stories is a method of capturing a product's intended function via communicating the requirements of said product between developers (Sharp et al., 2019, 388). The purpose is to describe the value for the user and thereby clarify the requirements. A user story is usually structured as a potential user with a role who performs a behavior that results in a benefit for the user. The template used for the user stories was: As a <role> I want <behavior> so that <benefit>.

User stories were constructed for each of the stakeholders based on the identified themes from the data collection. These user stories were organized in accordance with the theme. Some examples of user stories from the focus group participants that represent the theme ease of use are:

- As a <user> I want <the service to require as few steps as possible> so that <it's easy to use>.
- As a <user> I want <to not have to print a shipping label myself> so that <it's quick and easy to ship my donation>.
- As a <user> I want <the service to be integrated at checkout> so that <I don't have to go to a separate application>.

3.4.5 Identifying What Prevents the Target Behaviour

As described in section 2.3, FESP states that the designers should find what is preventing the target audience from performing desired behavior prior to starting development. The categories Fogg (2009a) outline are *ability*, *motivation*, and *triggers*, and analyzing the data from the focus groups with the categories in mind found that the participants primarily showed a lack of motivation and triggers. The participants showed the ability to donate with several of them having done so in the past. The lack of motivation is exemplified with statements such as “*I won't do it if it takes too much effort*” or “*I'm too lazy to do it*”. Participants have the ability to donate but refrain from doing so because of inadequate incentives to do so.

The participants also showed a lack of triggers, which is hinted at with statements such as “*If it was easy and cheap I would do it*”. This shows that the participants are in need of triggers, specifically facilitator triggers, to perform the desired behavior of donating clothes to charity. For the scope of this project, we chose to focus on the lack of motivation as it was more prevalent in the target audience.

4 Define

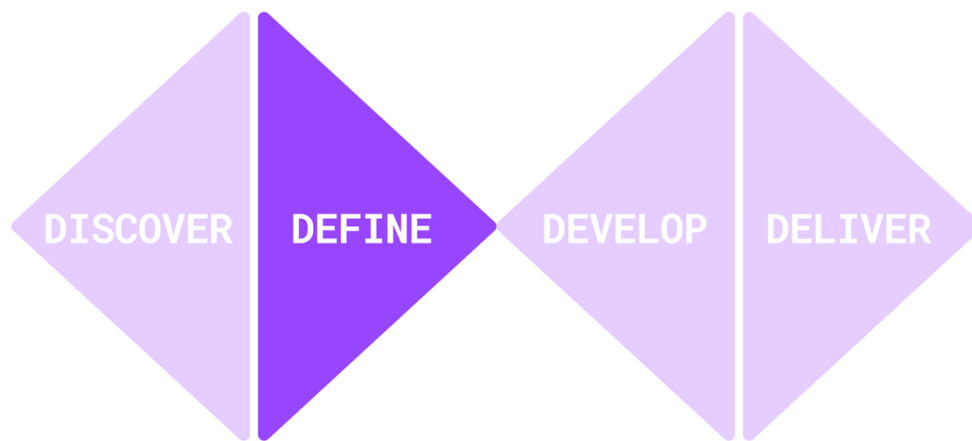


Figure 4.1. The Define phase of the Double Diamond.

Define is the second phase of the Double Diamond method. It regards narrowing the focus and determining what problems the project is to undertake. In this section, the design challenge is established as well as the target behavior, target audience, and technology channel in accordance with step one, step two, and step four of Fogg's eight step process.

4.1 The Design Challenge

Defining the design challenge that will be undertaken is an important activity in the process of interaction design. It makes it clear to each person involved exactly what problem the project is meant to solve, and what will be required to solve it (Olaniyi, 2022).

As seen in the conducted user research, there is a need for more efficient ways to donate clothes to charity organizations. The existing solutions all have various drawbacks, e.g. a lack of feedback to the user on where their donation ends up, and

the potential donors have a hard time finding the motivation to donate clothes they no longer need. The challenge this project tackled was therefore how to create a service that allows and motivates its users to donate clothes to charity organizations.

4.2 Objectives

The goal of this project was to create a polished and thoroughly tested prototype of an application that simulates all the steps a user will take when donating to a charity organization by reusing their packaging from an online vendor. Further stipulations were that the design should be informed by frequent user testing and feedback, meaning that the potential users would have a large impact on the direction of the project. Another goal was that the project would explore different methods of nudging users into the act of donating, and result in a deeper understanding of what users are motivated by in the field of donations.

4.3 Target Behaviour

The target behavior for this project was to make people reuse their packaging from e-retailers and use it to donate to charity-organizations.

4.4 Target Audience

The target audience chosen for this project was people between the ages of 19 and 29 years old, based on the results of the online questionnaire where 64% of the participants were of this age. However, it was also decided to adopt an inclusive design mindset to allow users from a wide range of demographics to be able to use the application and donate clothes to charity.

4.5 Technology Channel

The online questionnaire showed that the majority of the respondents use their smartphone when shopping online. The benchmarking in [section 3.2](#) showed that most applications similar to the product we aimed to develop, regarding the target group and target behavior, were smartphone interfaces such as ShareTheMeal, Milkywire, and Grailed. Considering the data from the online questionnaire and

the benchmarking, a smartphone application was chosen as the technology channel for this project.

4.6 Assumptions

In order to commence development of the interface, certain assumptions were made. First and foremost, it was assumed that we had access to the users' personal data, including home addresses. This information was needed to create digital shipping labels. It was also assumed that the service is free of charge for the users, meaning that no payment method had to be prototyped.

4.7 Requirements

According to Sharp et al. (2019, 387), a requirement is:

“A statement about an intended product that specifies what it is expected to do or how it will perform”.

Formulating requirements is helpful in the early stages of development, as it gives the project clear goals of what functions the application should perform.

By analyzing user stories presented in section 3.4.4. it was possible to derive requirements that the service should fulfill. For example, take the following user story:

As a <user> I want <to choose what organization my donation goes to> so that <I feel secure it is used for something I feel comfortable with>

This user story was interpreted as the following requirement:

Let the user choose which charity to donate to.

The requirements were rated necessary, desirable and unnecessary according to their frequency and what was considered realistically achievable in an application (see Figure 4.2).

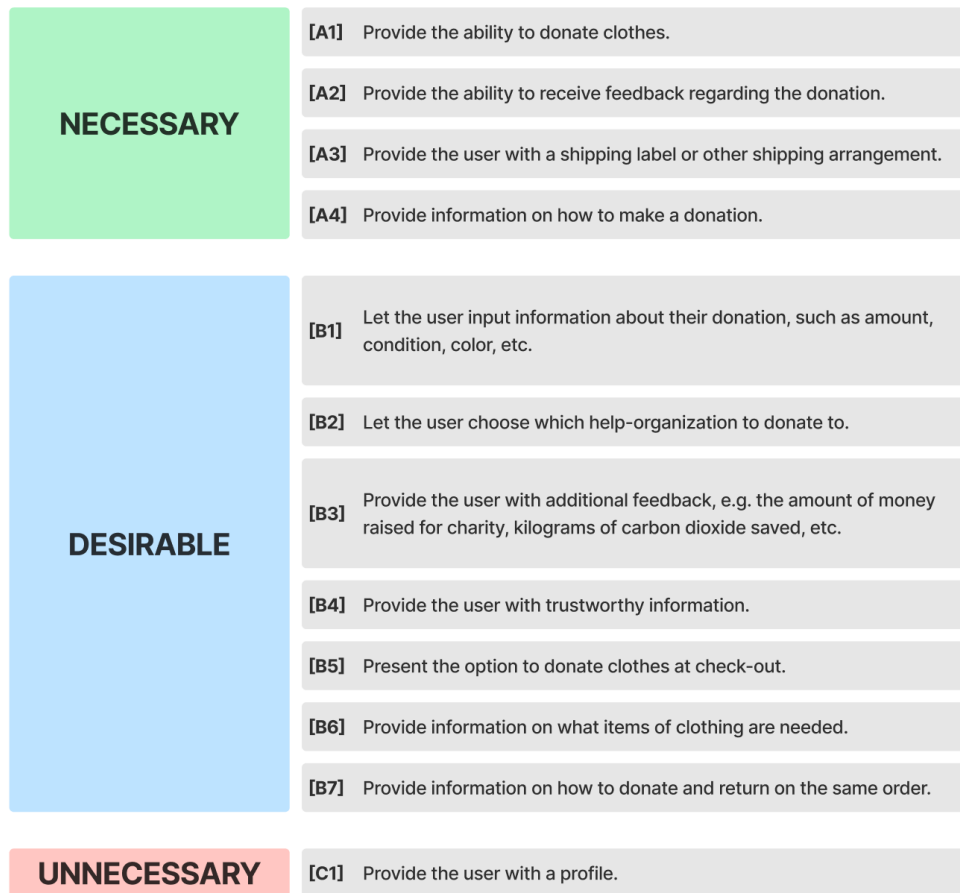


Figure 4.2. The derived requirements set for the application.

4.8 Functions

The requirements were interpreted into the functions listed below. Each function corresponds to one or more requirements and are referenced to accordingly. All the necessary requirements were interpreted into functions, whereas a few of the desirable ones deemed feasible were implemented.

- *Explore* - The *Explore* screen provides the user with information on how to donate [A4]. Additionally, it allows displaying of trustworthy information regarding the charities work [B4], as well as other useful information on donating clothes using the application [B6, B7].
- *QR-codes* - To ship their donation, the user receives a QR-code when they register their donation using the application [A3]. The user can access these digital shipping labels in the QR-code tab.
- *Donate* - The *Donate* function allows the user to register their donation [A1], and simultaneously choose which charity that they want to donate to [B2].
- *Messages* - The user can receive feedback on their donation and other directives in the *Messages* tab [A2].

5 Develop

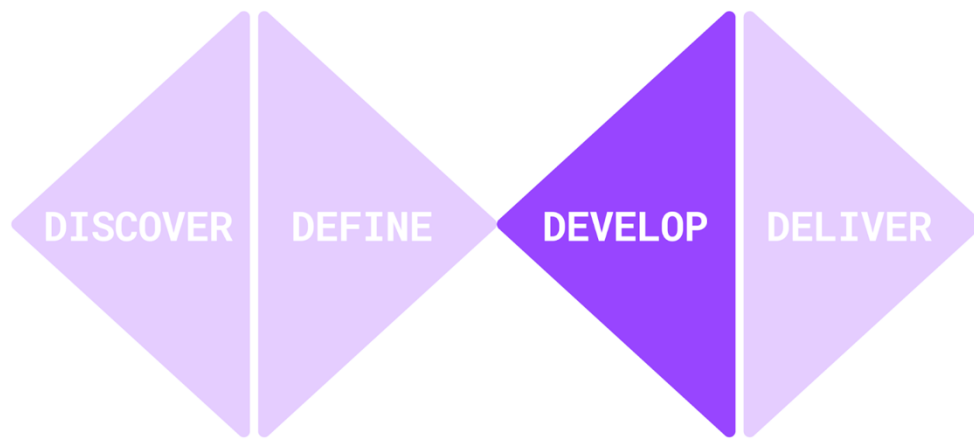


Figure 5.1. The Develop phase of the Double Diamond.

Develop is the third step of the Double Diamond process, in which development of the user interface is conducted. To structure the Develop phase we used the Scrum method. The development was divided into four sprints, with the first three sprints focusing development on the general functionality of the application, and the fourth focusing on the implementation of nudges and motivational aspects.

5.1 Sprint Overview

We conducted our design process according to the Scrum framework, partitioning the overall goal of creating a polished prototype into sprints. The time period for each sprint was set to two weeks in accordance with step seven in FESP: *to test and iterate quickly* (see [section 2.1.2.](#)). Each sprint had a defined goal to achieve during that time. This section will go over the four sprints conducted in the design process, including what the goal for each sprint was and how well that goal was met at the end of each sprint.

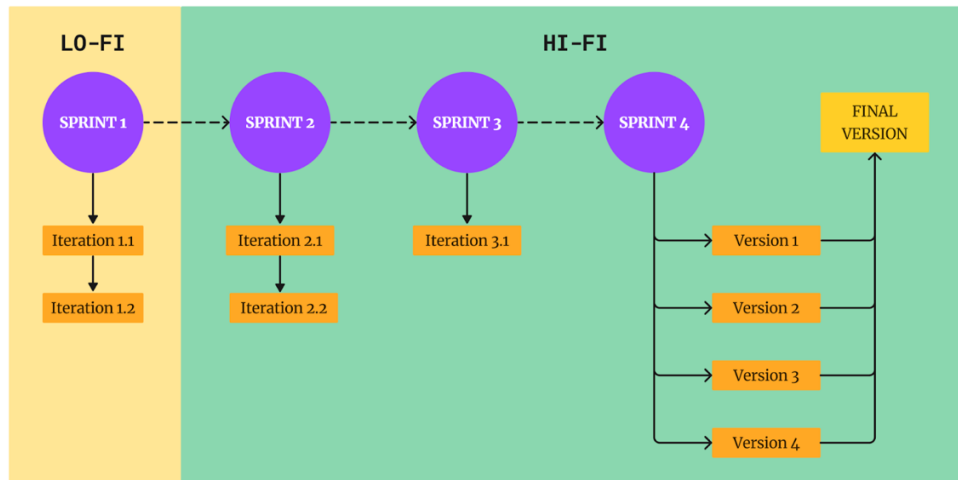


Figure 5.2. Breakdown of the conducted sprints and the iterations they contain.

5.2 Sprint 1 – Paper Prototyping

The goal for Sprint 1 was to create a polished paper prototype of the application, with the functions *Donate* and *Shipping labels* implemented, and to test that prototype on multiple users.

Sprint 1 ended up containing two different iterations, separated by user tests. The iterations are detailed below.

5.2.1 Iteration 1.1 – The Donate Function

We started the first iteration by creating one concept each for the function *Donate*, the main function of the application. The concepts were based on the previously derived requirements from the data analysis, especially focusing on making it simple to choose which charity organization to donate to. To increase the immersion of the tests we created a frame to contain the paper prototypes, simulating the experience of holding a smart phone (see Figure 5.3).

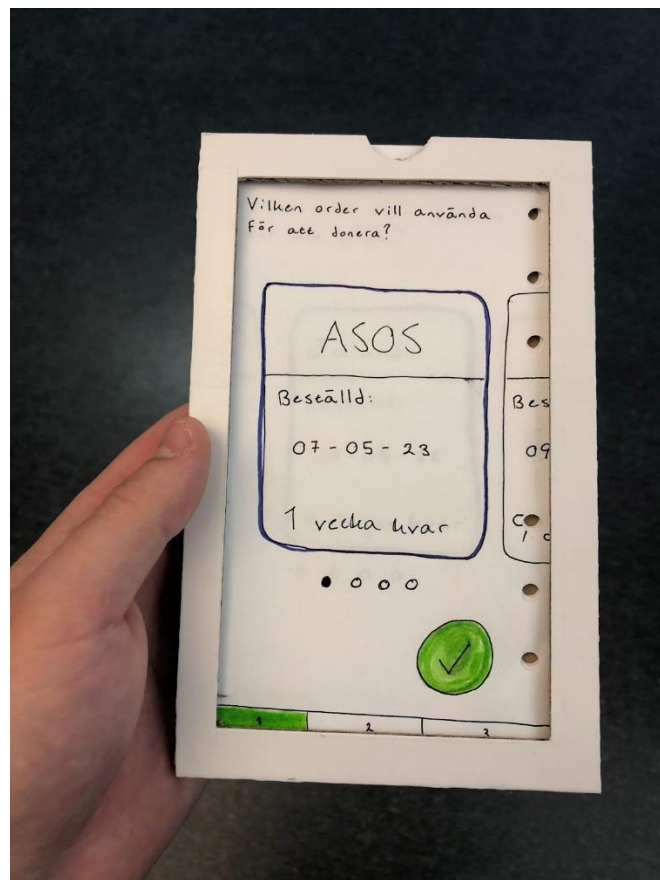


Figure 5.3. The frame used for testing the paper prototypes.

Both developed concepts used the same required steps to complete a donation:

1. The user chooses a package to use in their donation.
2. The user chooses which charity to donate to.
3. The user reviews their choices and confirms that everything is correct.
4. The donation is complete.

The first concept was a list, presenting first the packages and then the charity organizations. The concept can be seen in Figure 5.4.



Figure 5.4. Some steps of the list-concept.

The second concept took the form of cards that the user swipes between, as seen in Figure 5.5.

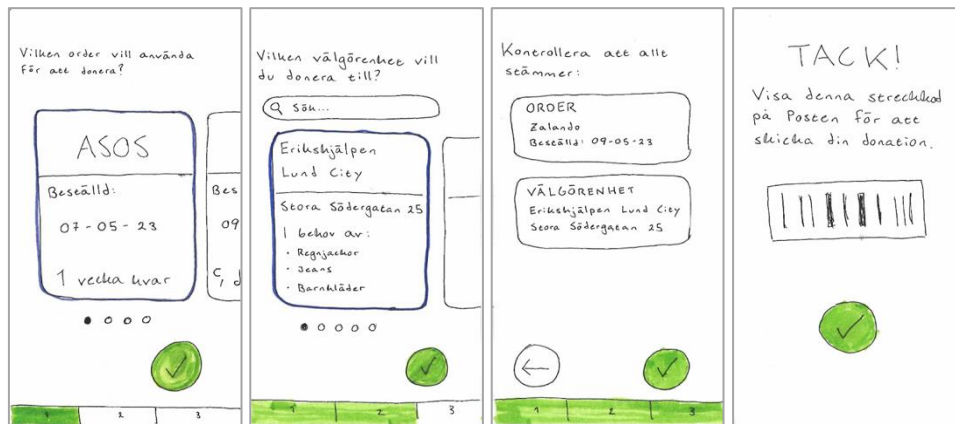


Figure 5.5. The steps of the card-concept.

5.2.2 Evaluation of Iteration 1.1

Users were tasked to choose their order from Zalando and to donate to Erikshjälpen. The user test was conducted on eight participants, with data being collected using a simple one to five scale. Each user was asked to rate the prototypes numerically in relation to four categories: *efficient*, *easy to use*, *recognizable*, and *clear*.

Within-subject experimental design was used, meaning that each participant tested both concepts one after the other. This led to the problem of the participants familiarizing themselves with the scenario and user interface, skewing the result in favor of the second concept. To counteract this we used counterbalancing, meaning that half the test participants were presented with the list-concept first, and the other half were presented with the card-concept (Sharp et al., 2019, 535).

The test results showed that the card-concept seemed more efficient to the user, but that it was equal or worse to the list-concept in all other aspects.

5.2.3 Iteration 1.2 - Drop Down and Finding the Shipping Label

The second iteration built on the knowledge we procured from the first. The user wanted less information than expected, and the overall visual clarity needed to be improved. This led to the development of the drop down-concept (see Figure 5.6).



Figure 5.6. Some steps of the drop down-concept.

In this concept both the choice of order and charity organization were presented on a single screen. Drop down-menus are a well-known design feature for many users, meaning they have a high degree of recognizability.

In this iteration a simple user interface was also prototyped for the overall user interface, allowing the user to find their shipping label needed to send the package after a donation has been registered (see Figure 5.7).



Figure 5.7. The prototype of the overall user interface.

5.2.4 Evaluation of Iteration 1.2

The user test on this concept was conducted in the same manner as the previous iteration, with the only difference being that five users participated instead of eight. The reaction to the drop down-concept was unanimously positive: as can be seen in Figure 5.8 it received the highest average score compared to the previous two concepts.

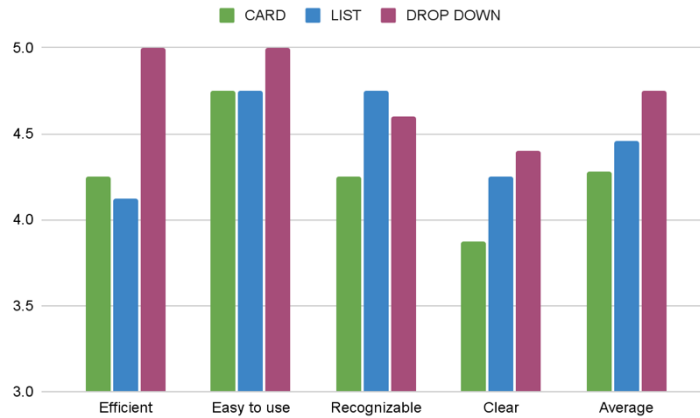


Figure 5.8. Results from testing the drop down-concept compared to the previous concepts.

The interface for finding the shipping label was not as well received, with an average score of 3.9. The prototype mostly faltered in the category *clear* according to the test participants.

5.2.5 Summary of Sprint 1

The goal of the first sprint was to create a polished paper prototype of the donation-function and to let the user find their shipping label after they had finished their donation. Regarding the donation-function the sprint was successful, seeing as the drop down-concept performed well with testers. Concerning the shipping label the sprint was not as successful: only one concept was tested with considerably worse performance than the *Donate* function.

5.3 Sprint 2 – Creating a Prototype in Figma

Sprint 2 marked the end of paper-based-prototypes, and all prototypes from this point were considered high-fidelity prototypes and created digitally in Figma.

The goal for Sprint 2 was to implement the paper prototype from Sprint 1 in Figma, including new features such as a home screen and messages, and to test it on multiple users. Two iterations were developed in Sprint 2, separated by user tests in the same way as in Sprint 1. The test techniques used in this sprint were however more sophisticated, as will be explained in the coming sections.

5.3.1 Iteration 2.1 - Three or Five Buttons?

Using the previous paper prototype as a starting point, a prototype was constructed in Figma. It contained the drop down-concept that performed well in the previous user test (see Figure 5.9), and implemented a separate button for shipping labels.



Figure 5.9. The drop down-concept implemented in Figma.

As seen in Figure 5.10, a simple *Explore* screen was implemented using colored cards as pressable buttons containing information. The upper set of cards, under the headline “*Information*”, scrolled horizontally, while the rest of the home screen could be scrolled vertically. A new concept for the *Message* function was also implemented, using a tab interface to switch between direct messages and overall notifications. At this point, a *Shipping label* function was also implemented where the user could access their digital shipping labels, displayed as a carousel.



Figure 5.10. The Explore screen, Shipping label, and Message function.

Two different versions of the overall user interface were created: one which featured three buttons on the bottom banner, with the other two being secluded in the top right of the screen, and one which featured all five buttons on the bottom banner. Both versions are shown in Figure 5.11.



Figure 5.11. The two versions of the overall user interface.

5.3.2 Evaluation of Iteration 2.1

To test which configuration of buttons was better, a new test method was developed. It consisted of the user being given a specific task to complete, while their navigation through the application was recorded with the iPhone's built-in screen recorder. The recording was then analyzed according to three dependent variables:

- How long did it take for the user to complete the task?
- How many errors did the user make?
- Were any particular errors made by multiple users?

After the user had completed the given task, they were interviewed and asked five open ended questions. This test method was constructed to provide both quantitative and qualitative data, with the hope of capturing both the technical performance of the app as well as its emotional qualities. The test was conducted on six participants, with within-subject experimental design being used as in the previous test. Half the participants were presented with the five button-concept first and vice-versa. Their task was to choose their package from Zalando and donate to Erikshjälpen, and afterwards to find their generated shipping label.

The first interesting data point was the time it took the participants to finish their given task. As can be seen in the graph below, the three-button layout was faster when given as the first concept by a considerable amount. It was however slower when presented as the second concept, which may indicate that the five-button layout is faster for an experienced user. The data is presented in Figure 5.12.

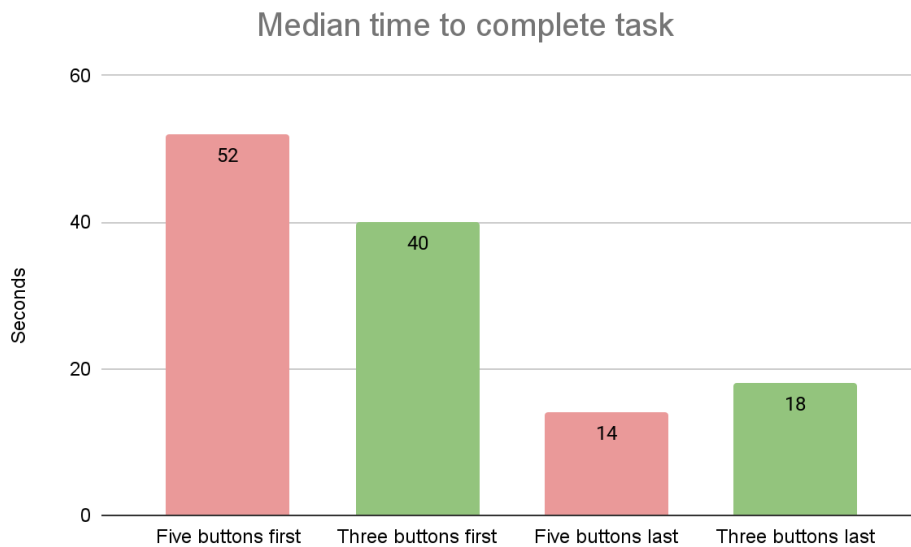


Figure 5.12. The median time it took for the participants to finish their given task, based on what order they tested the concepts in.

The median number of errors per user showed that the five-button layout was more confusing to the participants, with two errors made in comparison to the three-button layout at one error made. However, the number of errors were not as interesting as the particular errors made by users. All participants misunderstood how to access the *Donate* function, and instead tapped on one of the placeholder information cards on the home screen. This is illustrated in Figure 5.13.



Figure 5.13. To the left is the correct button to tap to reach the *Donate* function, and to the right is where all the participants tapped trying to reach it.

This particular error showed a big design flaw in the concept, seeing as the intended solution was both hard to spot and that there was only one way for the user to reach it. It was a discovery that greatly influenced the design of the next iteration.

The interviews conducted after the tests gave insights that were not apparent during the tests themselves and were the deciding factor in choosing which layout to continue with. For example, participants expressed having a hard time finding the barcode icon in the top right, even when it was accented by a red dot (see Figure 5.14).



Figure 5.14. The barcode icon that was hard to find for the participants.

Another noteworthy piece of feedback was one participant who gave the suggestion that the buttons should be labeled, to make it clear what they do without having any previous knowledge of the application. Finally, we found through the interviews that the three-button layout overall was considered less satisfying and easy to use than the five-button layout, even though it contradicts the collected quantitative data. This discrepancy probably stemmed from the small number of participants, and we therefore decided to proceed with the five-button layout based on the feedback from the interviews.

5.3.3 Iteration 2.2 – The Explore Screen and Donation Function

A new prototype was created, taking into consideration all the insights that were gained from Iteration 2.1. The *Explore* screen was reworked to include cards for the charities, inspired by the errors made by participants in the previous test. This provided an alternative path to reach the *Donate* function, in line with Nielsen's seventh heuristic: flexibility and efficiency of use. The cards also functioned as a way to present more information about the charities to the user, such as their address and what garments they are in need of at the moment. This feature was also inspired by ShareTheMeal, presented in [section 3.2.1](#). The cards can be seen in Figure 5.15.

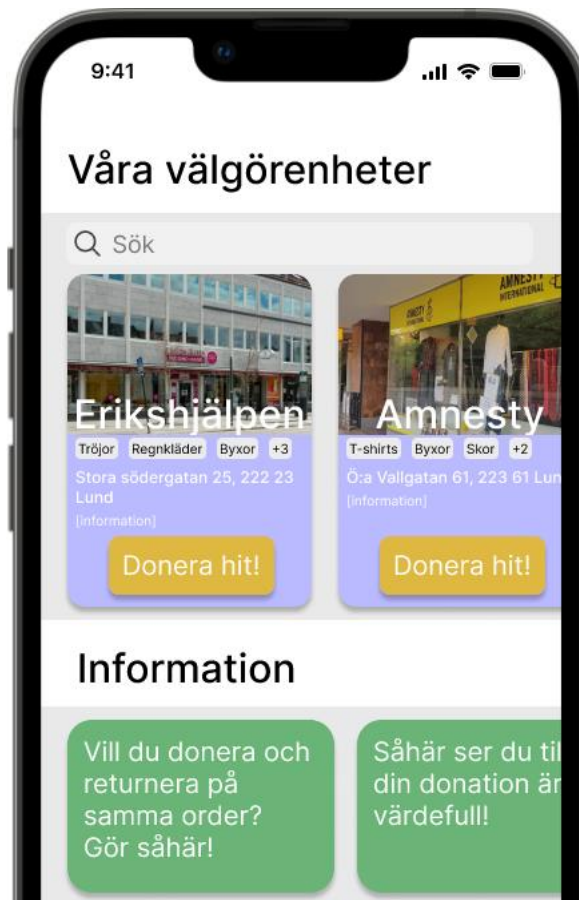


Figure 5.15. The reworked *Explore* screen with cards for the charities.

Another addition was that all buttons were now labeled, to make it clearer to the user what they do before being pressed (see Figure 5.16).

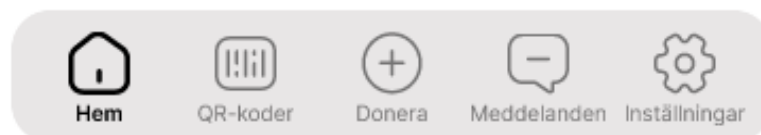


Figure 5.16. Labeled buttons on the bottom banner.

At this point it was decided to rework the *Donate* function, as it was of considerably worse visual quality than the rest of the prototype. Two different concepts were developed: a drop-down menu (see Figure 5.17) and a horizontal scroll (see Figure 5.18).

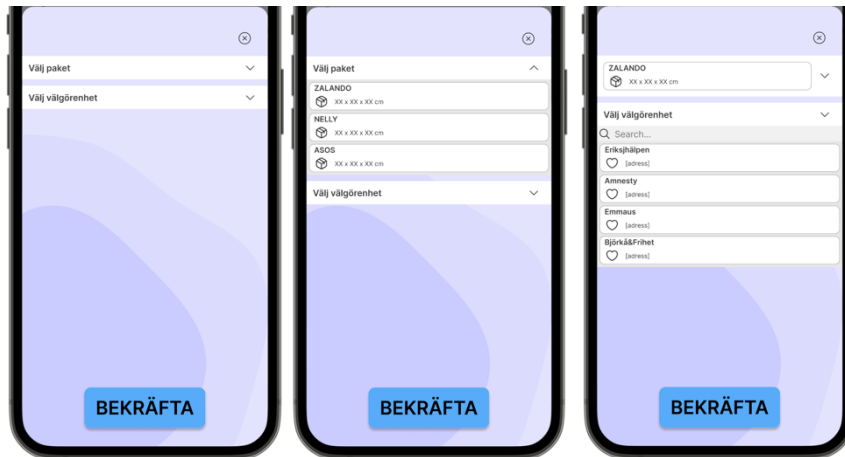


Figure 5.17. The drop-down menu implemented in the *Donate* function.

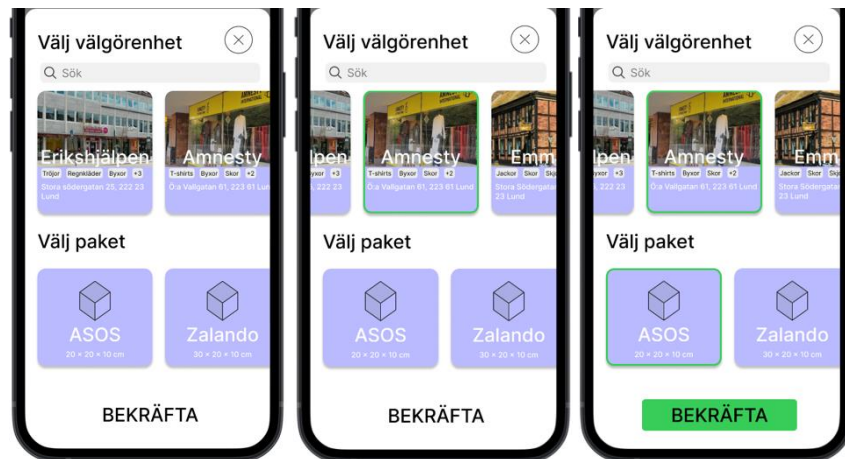


Figure 5.18. The horizontal scroll implemented in the *Donate* function.

5.3.4 Evaluation of Iteration 2.2

We could not internally decide on which donation concept to proceed with, and therefore performed a simple user test: the concepts were shown to five people who were then asked which concept was their favorite. The results were that three people preferred the horizontal scroll and two preferred the drop-down menu. Thus, we decided to proceed with the horizontal scroll.

5.3.5 Summary of Sprint 2

The goal for Sprint 2 was to implement the paper prototype from Sprint 1 into a digital Figma-project, while adding functions such as a *Explore* screen and *Message* function, and to test the digital prototype on multiple users. The result at the end of the sprint was a reasonably polished prototype, with all base functions implemented in various levels of quality. The *Explore* screen received much thought and a major redesign after the first user test, and the *Donate* function was brought to a higher quality in the second iteration. The prototype was also subjected to a major test after the first iteration. Therefore we concluded that the goals for Sprint 2 were achieved, but that a bigger user test at the end of the second iteration would have been beneficial.

5.4 Sprint 3 - Design Overhaul

The goal for Sprint 3 was to implement and polish all the base functions of the application, meaning *Explore*, *QR-codes*, *Donate*, *Messages*, and *Settings*. Polish in this context meant to increase readability and overall accessibility, to create satisfying animations, and to make the application more visually appealing. To ensure that the goal was met an extensive user test was conducted at the end of the sprint, which contained one iteration.

5.4.1 Iteration 3.1 - Aesthetics and Readability

During Sprint 3 we did a major design overhaul to increase the overall aesthetics, consistency and readability of the entire application. The color scheme was updated to be more pleasing and consistent throughout all the functions. It was also decided to make the colors muted to be less distracting. Organic shapes were added to the background of certain functions to further improve the visual quality of the application. These changes fall in line with Nielsens eight heuristic, aesthetic and minimalist design.

To increase the readability of the application we followed established design norms when designing for smartphones. For instance, according to Apple (n.d.) it is important to use a minimum font size that is still legible to most people, and we therefore chose to use 16px as the smallest text used in the application, with a select few exceptions. This change led to an overall increase in font size, and an increase of the overall size of the design components to fit the larger text. For instance, the size of the cards showing information about the charities more than doubled from their design in Sprint 2, drastically increasing their readability as can be seen in Figure 5.19. The font used in the application was also updated to aid readability.

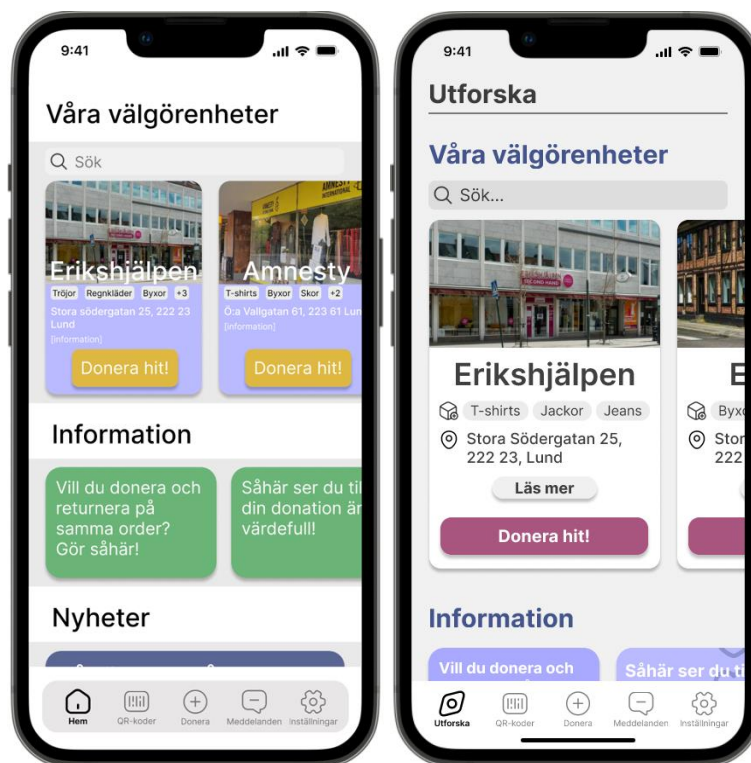


Figure 5.19. To the left, the home screen of Sprint 2. To the right, the home screen of Sprint 3 with the larger charity cards.

The design of the *Donate* function was changed to increase the number of options presented to the user by showing two rows of charities instead of one. By increasing the width and decreasing the height of the cards used, it was possible to both show more options and increase the font size, increasing both readability and usability at the same time. This change can be seen in Figure 5.20.



Figure 5.20. The *Donate* function from Sprint 2 on the left, and the same function from Sprint 3 on the right.

The *QR-codes* function was changed to also include an animation when swiping between the individual codes. *Messages* was updated to only include a messages tab and not a notifications tab to avoid confusing the user. At this stage we also added a representation of *Settings*. These changes can be seen in Figure 5.21.

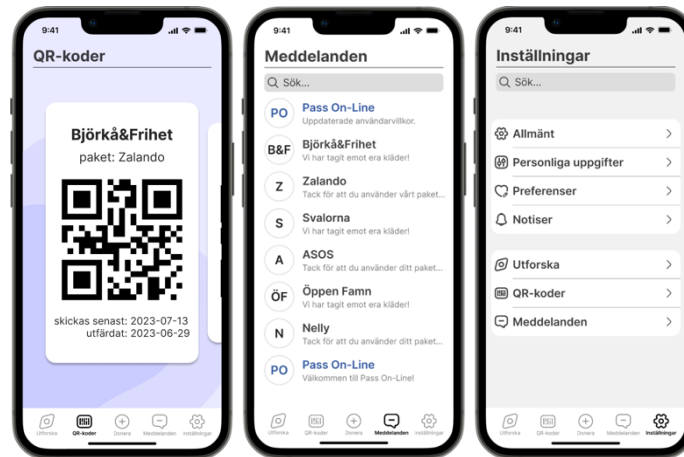


Figure 5.21. QR-codes, Messages and Settings redesigned.

A simple log in-sequence was also implemented, to simulate the experience of opening the application for the first time. It also includes a welcoming pop-up that thanks the user for using the application, as can be seen in Figure 5.22.

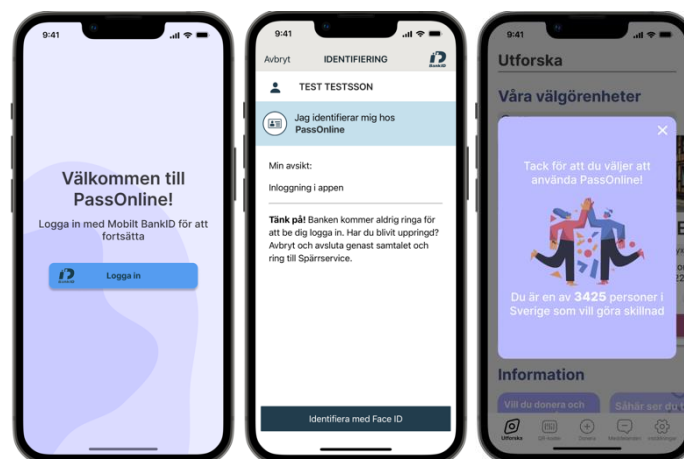


Figure 5.22. The log in-sequence, in order from left to right.

5.4.2 Evaluation of Sprint 3

We conducted the most extensive user test up to this point in the project to test the changes made in Sprint 3. Participants were asked to complete a set task, which in this case was more open ended than previously by allowing three different charities and packages to be chosen. The task was the following:

1. Log in to the application.
2. Choose a charity from the options Erikshjälpen, Emmaus and Amnesty, and donate a package to them.
3. Find the QR-code needed to send the package via post to the charity.
4. Find the message the charity sends when they receive the package.

The interview questions and dependent variables remained the same as in the evaluation of Iteration 2.1 (see [section 5.3.2](#)). The results of the test showed that the application performed well, with a median of one error per user. Three users completed the task with zero errors, without having any previous experience of testing our earlier prototypes. The one particular error made by four users was a minor one: they did not see that the charity they chose on the home screen was pre-selected when the donation window opened, leading to an unnecessary input (see Figure 5.23).



Figure 5.23. The highlighted option that was missed by several users.

The average time to complete the test was two minutes and 15 seconds, but the time was deemed to not be an important factor after we had conducted our tests. The reasoning behind this decision was that the test participants relate to the test differently: some want to explore the application and perform all available actions, while some want to complete the task as soon as possible.

5.4.3 Summary of Sprint 3

The goal for Sprint 3 was to implement all the base functions of the application and to test them thoroughly. At the end of the sprint all five functions had received a major redesign, improving their readability and useability. This result was confirmed by a large user test that showed positive results: for the first time in the project several test participants performed the test with zero errors, despite it being the longest and most complex task thus far. We therefore concluded Sprint 3 to be a success, as the application was both visually and functionally improved by the redesign.

5.5 Sprint 4 - Implementing Motivational Nudges

The final sprint dealt with implementation of different nudges and persuasive aspects, and examining which of these approaches was the most effective at motivating participants to donate. The goal for Sprint 4 was therefore to determine what nudges and functions were the most motivating to users.

As mentioned in [section 3.1.1](#), Fogg (2009a) describes three different types of motivation: belonging, sensation and anticipation. Belonging considers a person's desire to fit in with a group or community. Sensation refers to motivation through pleasure or pain. Anticipation is when people are motivated by a promise of future rewards or outcomes. In Sprint 4, we examined the effects of these different types of motivation on people's intent to donate clothes to charity to determine which is most effective. This was done by developing three different versions of the application, each having different nudges and aspects implemented in regard to the type of motivation. These different iterations were then compared to a basic version of the application to determine their relative effectiveness through user tests, complemented with an online survey. The basic version of the application was the iteration from Sprint 3, with certain changes based on the user test conducted, and is described in the following section.

5.5.1 Version 1 – Basic

The so-called basic version consists of the reworked prototype from Sprint 3, with implemented changes based on the user test. The pre-selected option in the donation window, that is the result of the user choosing to donate to a specific charity in the *Explore* page, was adjusted to clearly communicate that the choice of charity had already been made. We added an animation where the pre-selected option changes color and is enlarged after a short delay when the donation window is opened. This change was made to catch the users' eye, so they know their choice has been registered by the application. We also chose to change the color from green to a light maroon to better align with the color scheme of the application (see Figure 5.24).



Figure 5.24. When choosing to donate to Erikshjälpen on the *Explore* screen, the donation window appears with Erikshjälpen pre-selected after a short delay.

Below is a brief summary of the functions that the basic version provided before any belonging, sensation and anticipation-nudges were implemented.

- Log-in sequence with a welcoming pop-up when signing in for the first time.
- The user can donate by either tapping *Donate* on the banner menu or selecting a charity of their choice on the *Explore* screen. As such, a choice of charity is available in both *Donate* and *Explore*.
- The QR-codes generated from the donation process can be accessed by tapping the *QR-codes* icon in the banner menu.
- The user can receive feedback on their donation, which is available in *Messages*.
- Information about the available charities, general information regarding textile recycling, as well as help on how to donate and making the donation as beneficial as possible, is available in the *Explore* screen.

With the base functions established, we proceeded to develop the three motivating versions of the application.

5.5.2 Version 2 – Social Nudges

The second version of the application regards the motivation type belonging, i.e an individual's desire to fit in with a group or community. Therefore, we aimed to implement nudges and functions that motivate the user through portraying donating clothes to charity as the social norm.

“Don’t Mess with Texas” is an example of a successful marketing campaign for reducing littering that used social nudges. The campaign created an expectation among the Texans that others will refrain from littering, thus making it the social norm. Research has shown that a person will conform to a certain behavioral pattern on the account that they believe that either enough people are conforming, or enough people are expecting them to conform to said pattern (Nagatsu, 2015).

The following changes were implemented in accordance with what Thaler and Sunstein (2009, pp. 55-56) refer to as *conforming*, or *following the herd*. This refers to a person’s need for affirmation, fear of isolation and avoidance of risk and embarrassment. The changes implemented in this version were meant to portray donating to charities as a norm, encouraging other users to do the same.

Settings was removed from the banner menu and replaced with a *Profile* page, in which the user could add friends to see their donation activity as well as invite new friends to download the application. The user could also monitor their own donation history. *Settings* was added as a tab in the profile page and remained unchanged from the previous iteration (see Figure 5.25).

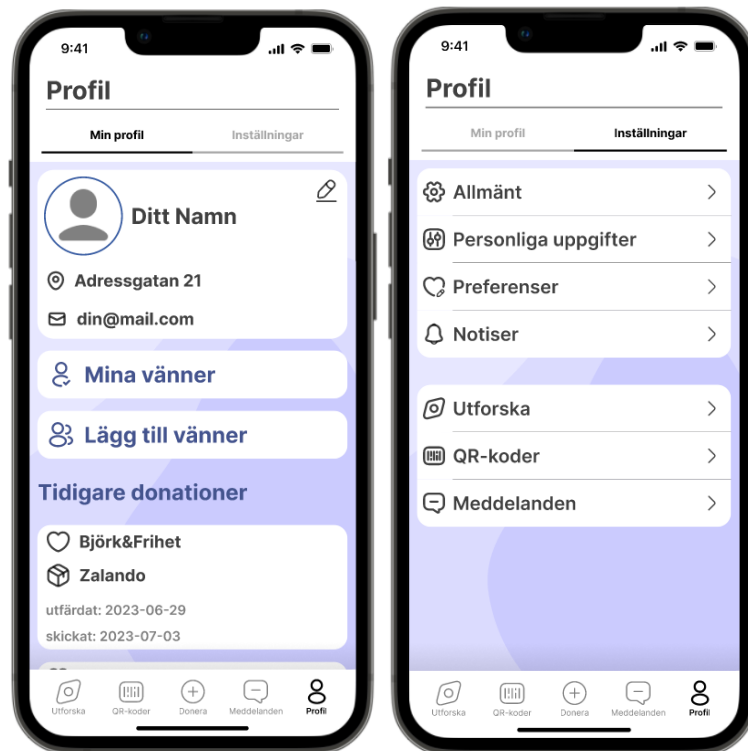


Figure 5.25. The Profile and Settings-page.

The *Explore* screen underwent several changes. The donation activity of the user's friends was added to the top of the *Explore* screen, where the user is also able to post a recent donation. The option to upload one's donation to the *Explore* screen was also presented when a donation had been registered and a QR-code had been created. Adding comments on people's donation activity was also available to the user, as can be seen in Figure 5.26.



Figure 5.26. The social function allows users to share their donation.

An informational frame containing the Swedish population's total amount of donations, users and saved kilograms of CO2 was added to the *Explore* page. This frame also included the daily increase of these three categories. User stories were also added, including descriptions of other users' experiences of using the app and donating clothes to charity. These changes can be seen in Figure 5.27.



Figure 5.27. The map of Sweden and user stories.

5.5.3 Version 3 – Emotional Nudges

In Version 3, we considered the user's *sensation*, meaning their positive and negative feelings associated with donating clothes to charity. Nudges were implemented to both induce the enjoyment and fulfillment of donating as well as enhancing the potential feelings of guilt that arise from refraining from donating. The objective of implementing emotional nudges is to motivate the user intrinsically, i.e motivating the user to engage in a behavior that is inherently satisfying or enjoyable (see section 3.1.2.).

Thaler and Sunstein's (2009, pp. 36, 69) heuristics *framing* and *priming* were adopted when redesigning the application with an emotional approach. Framing refers to presenting information in a manner that alters the perception of it, with for example negative or positive accentuation, juxtaposition or association. By altering the phrasing of certain components, we hoped to increase motivation of users. Framing was utilized when redesigning the feedback message. Priming relates to how people can be softened or hardened before a situation or option is introduced. This was also applied by rephrasing and redesigning certain elements, for example the informational carousel on the *Explore* page.

Most of the changes to this version were made to the *Explore* page, similar to Version 2. A bar displaying the monthly donation goal of the different charities was added to the charity cards displayed. This monthly donation goal is set by the charitable organization, and not the user. The cards under the “*Information*” rubric were changed to include more emotionally charged information regarding the charities and the feelings associated with donating clothes to charity. These changes are shown in Figure 5.26.

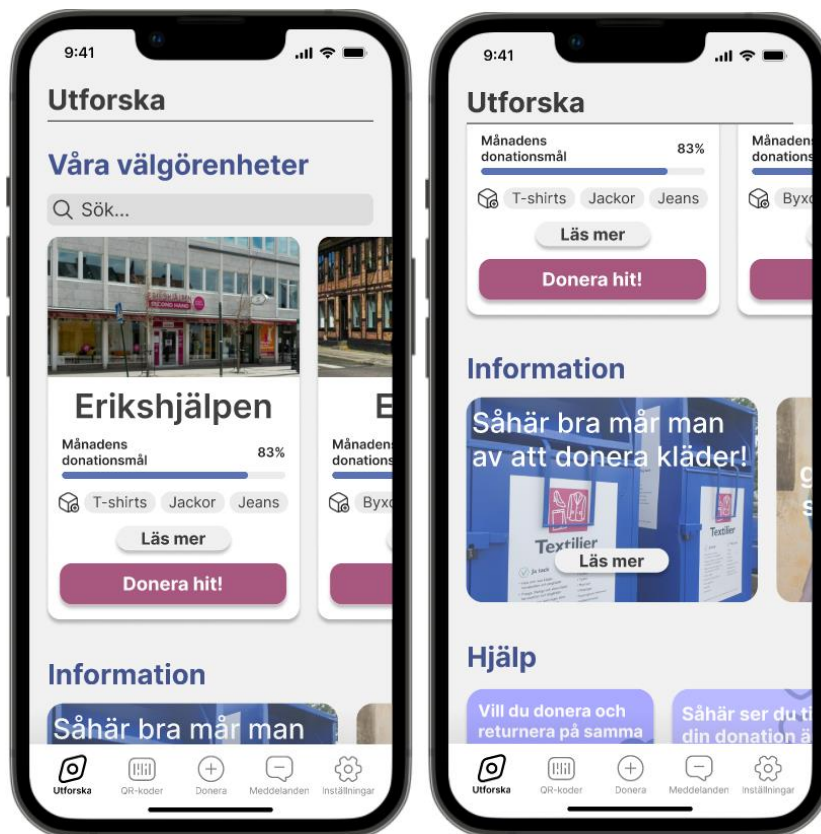


Figure 5.26. The *Explore* page of version 3.

Additionally, the message the user receives after completing their donation was also altered to be more sentimental, referencing the work the charities are doing in the ongoing conflict in Ukraine. The message is shown in Figure 5.27.



Figure 5.27. The sentimental message implemented in version 3.

5.5.4 Version 4 – Extrinsic Motivation

Anticipation refers to motivation through a promise of a future reward or outcome. This type of motivation was addressed in Version 4, where the applied nudges are in the form of extrinsic motivation. Extrinsic motivation is contingent on an outcome that is separable from the action itself (see [section 3.1.2.](#)).

Additionally, what Thaler & Sunstein (2009, pp. 40-44) call *temptation* was applied when developing Version 4. Temptation refers to peoples' attraction to options that offer quick appealing rewards. Thaler and Sunstein mean that people tend to be more tempted by receiving a smaller reward instantly rather than something bigger in the future. Thus, the interface was changed to award the user small rewards in the short term.

Available rewards from donating to each charitable organization were added to the charity cards on the *Explore* page, to replace the address of the charity. Other rewards available to the user were also displayed in a carousel on the *Explore* page below the charity cards (see Figure 5.28).



Figure 5.28. The *Explore* page of Version 4.

The feedback message was also altered to contain the attained reward from donating clothes to a charity, in the form of a barcode. The message is shown in Figure 5.29.



Figure 5.29. An example of a message containing a reward.

5.5.5 Evaluation of Sprint 4

The evaluation of Sprint 4 consisted of two parts: a questionnaire, and in person user testing.

5.5.5.1 Questionnaire

A questionnaire was constructed, presenting the three different versions of the application with nudges implemented. The recipients were asked to rate how motivating they found each version on a one to five scale, and to rank them in order from least to most motivating. The questionnaire received 78 responses and produced the result shown in Figure 5.30.

Average rating of motivation

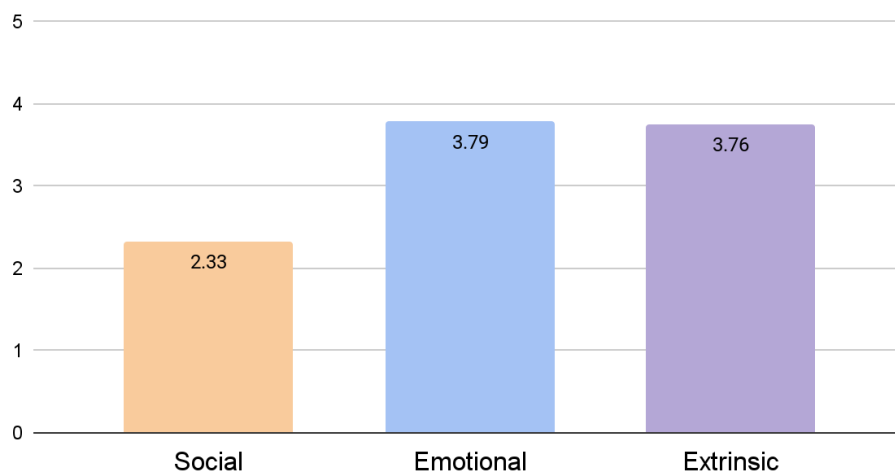


Figure 5.30. The average rating of how motivated each version made the participants in the study, rounded down to two decimal points.

The average rating of each version shows that the social nudges were the least motivating, and that emotional and extrinsic nudges were almost equally motivating to the participants. The same pattern emerged in the relative ranking of the versions, as can be seen in Figure 5.31, Figure 5.32, and Figure 5.33.

Relative ranking of social nudges

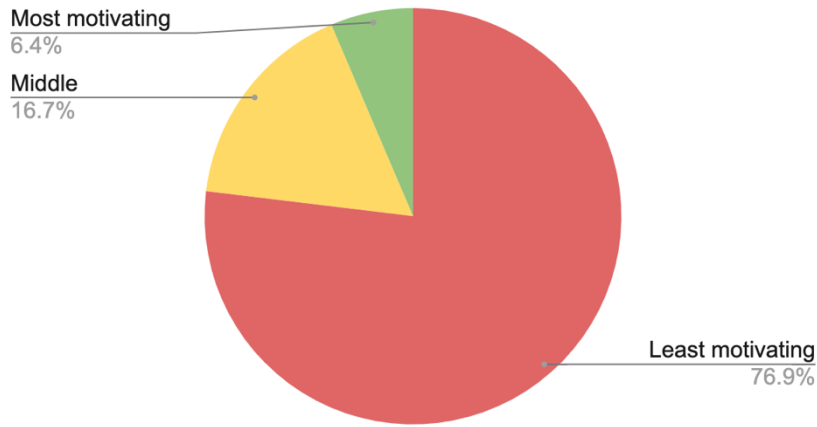


Figure 5.31. The percent of participants who found social nudges least, middle, and most motivating.

Social nudges performed worst in the ranking, with more than three quarters of participants deciding it to be the least motivating.

Relative ranking of emotional nudges

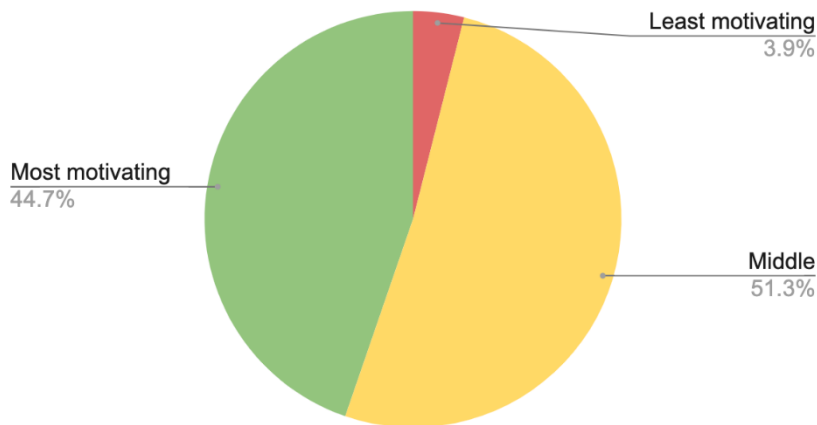


Figure 5.32. The percent of participants who found emotional nudges least, middle, and most motivating.

Relative ranking of extrinsic nudges

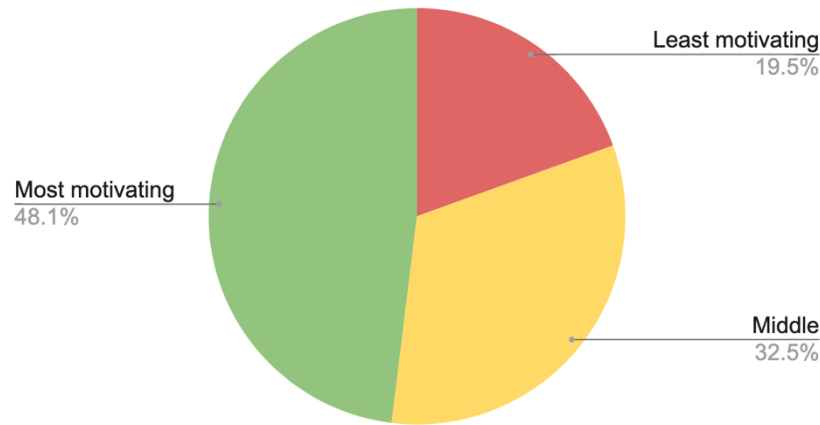


Figure 5.33. The percent of participants who found emotional nudges least, middle, and most motivating.

The results of the ranking between emotional and extrinsic nudges were not as clear. A small difference can be seen in the percent of people who thought extrinsic nudges were most motivating and the people who thought the same of the emotional nudges, with a 3.4 percentile unit difference in favor of extrinsic nudges. However, a substantial number of people found extrinsic nudges to be least motivating, while very few thought the same of emotional nudges.

5.5.5.2 User Tests

The user tests took the same form as previously, meaning that users were given a task to complete and then interviewed. However, the reason for the test was different: we were no longer focused on the overall functionality of the application, instead focusing on gauging how motivated the different versions made the participant. Therefore the participants were free to ask questions on how to perform certain actions, and we explained the differences between the versions when necessary. Six participants were part of the test, and they were all given the same task in all four versions:

1. To donate to a charity.
2. To find their QR-code.
3. To find the message from the charity letting them know that the donation has arrived.

The task was designed to make the participant see all the differences between the versions, as they were mostly seen on the *Explore* page and in *Messages*. After the participants had completed their task, they were asked to rate their level of motivation on a one to five scale. The result is shown in Figure 5.34.

Average rating of motivation

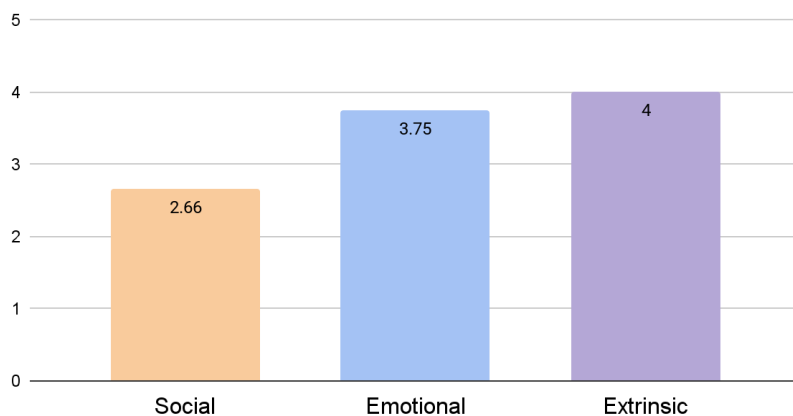


Figure 5.34. The average rating of how motivated each version made the participants, rounded down to two decimal points.

In this result the version with extrinsic nudges was slightly in the lead over the emotional nudges. The version with social nudges was, like in the questionnaire, determined to be least motivating.

During the interviews we wanted to find out what version the participant found to be most motivating, why that version was most motivating to them, and if there were any functions in different versions they would like to see implemented in the final version of the application.

Extrinsic motivation in the form of rewards, included in the extrinsic motivation version, was popular among the participants, which is also supported by the online survey. Statements such as “*I feel like my clothes have some value, so some form of reward for them would be nice*” further shows the interest of receiving some sort of compensation for their donation.

The data shows that the informational frame containing the Swedish population's total amount of donations, users and saved kilograms of CO2 and the daily updates (included in the social version) was appreciated by the participants. This is exemplified by statements such as “[T]he informational frame with Sweden's contribution. I think that was nice” and “[T]he Sweden-map was great”.

Furthermore, information regarding the charitable organizations work in the emotional version was shown to be beneficial to the participants, which is strengthened by statements such as “I want to read more regarding why you should donate and here you can get information about what difference you are making”.

A function that was not well received by the participants was the “stories” function included in the social version. They expressed that it was out of place with the statement “I don't like the “stories”-function, it feels like a social media app and not a donation app”. The participants meant that the main purpose of the application was lost: “The purpose is a donation app, not another social media app”.

5.5.6 Summary of Sprint 4

The goal of Sprint 4 was to determine which nudges and persuasive aspects are the most effective in motivating users to donate clothes to charity. The different types of nudges and aspects that were investigated were social, emotional and extrinsic. We were unable to resolve which type of nudging framework was most motivating to users, as the emotional and extrinsic versions performed similarly during our tests. The social version was not as well received by the participants. However, we were able to distinguish certain functions that were appreciated by the participants, such as the informational frame containing information about donation activity in Sweden, the emotionally phrased feedback message, the extrinsic reward system, and the informational carousels containing information about the charitable organizations' work.

6 Deliver

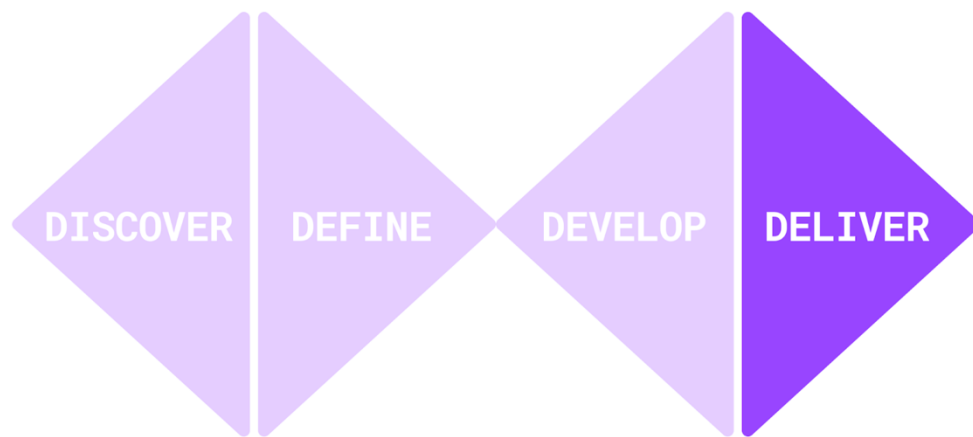


Figure 6.1. The *Deliver* phase of the Double Diamond.

Deliver is the fourth and final phase of the Double Diamond process. It consists of finalizing the prototype. In this section, the final version of the application is presented, and the included functions described. It features an onboarding experience, Explore page, Donate function, QR-codes page, and Messages. A Settings page was also implemented but not included in this section. The user can navigate between the different pages with the banner menu featured at the bottom of the screen.

6.1 Onboarding Experience

When opening the application for the first time the user is greeted with a welcoming message and is then prompted to log in using *Mobilt BankID*, as shown in Figure 6.2. As described in [section 4.6](#), Mobilt BankID gives access to the user's personal information, including their home address. Thus, the user does not have to enter their personal information themselves, which drastically reduces the time and effort needed to register.

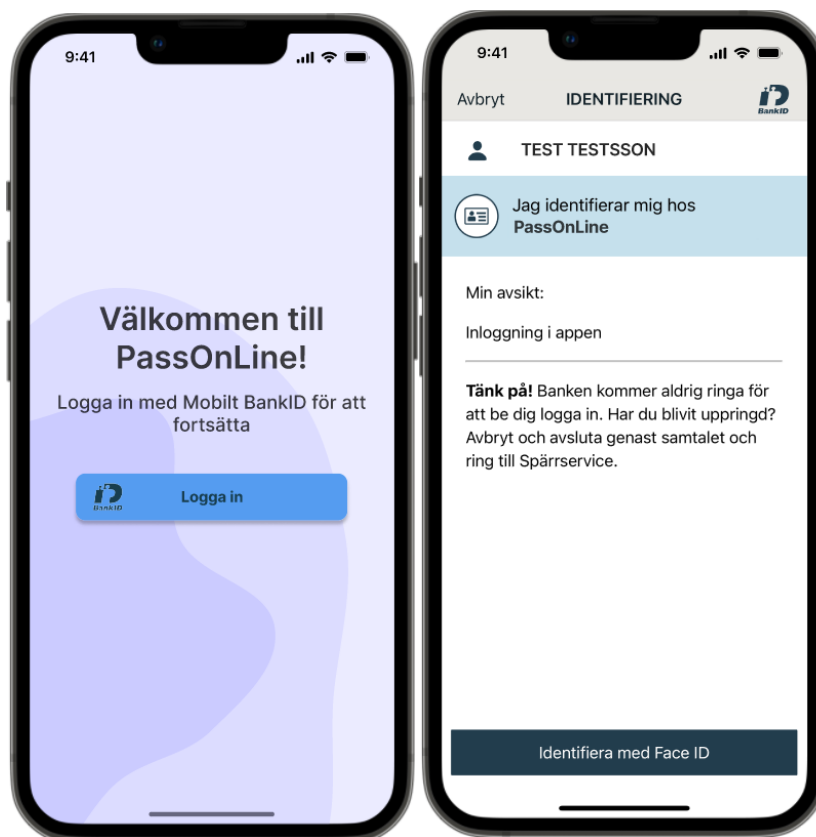


Figure 6.2. The log in-sequence using Mobilt BankID.

Following the login sequence, the user is presented with an informational onboarding experience, which briefly describes the donation process, from registering the donation to shipping it at the local post office. It also includes the same message that thanks the user for using the application, implemented in Sprint 3 (see Figure 6.3). This onboarding experience was developed in hopes of eliminating any confusion regarding the application's purpose and how it works.

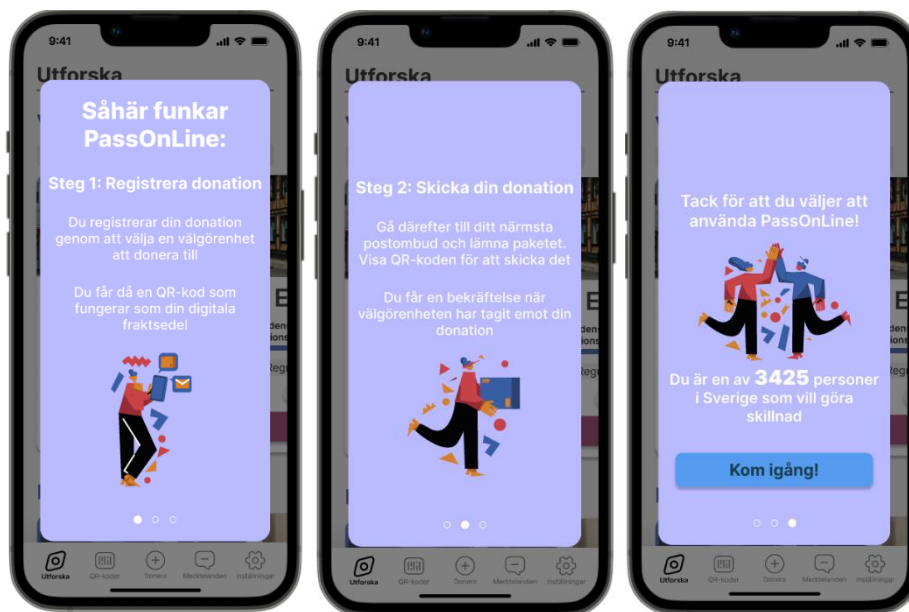


Figure 6.3. The onboarding messages welcoming the user when opening the app for the first time.

After tapping “*Kom igång!*” the user is redirected to the *Explore* page.

6.2 Explore Page

The *Explore* page includes many features. At the top of the page there are cards displaying the different charities that the user can donate to. It includes the monthly donation goal set by each charity as well as what items are currently desired. Each displayed charity also features a *Donate* button to encourage the user to donate to that particular charity. The user can tap “*Läs mer*” to expand an overlay with additional information about the charity. This overlay also includes the option for the user to donate to that charity (see Figure 6.4).

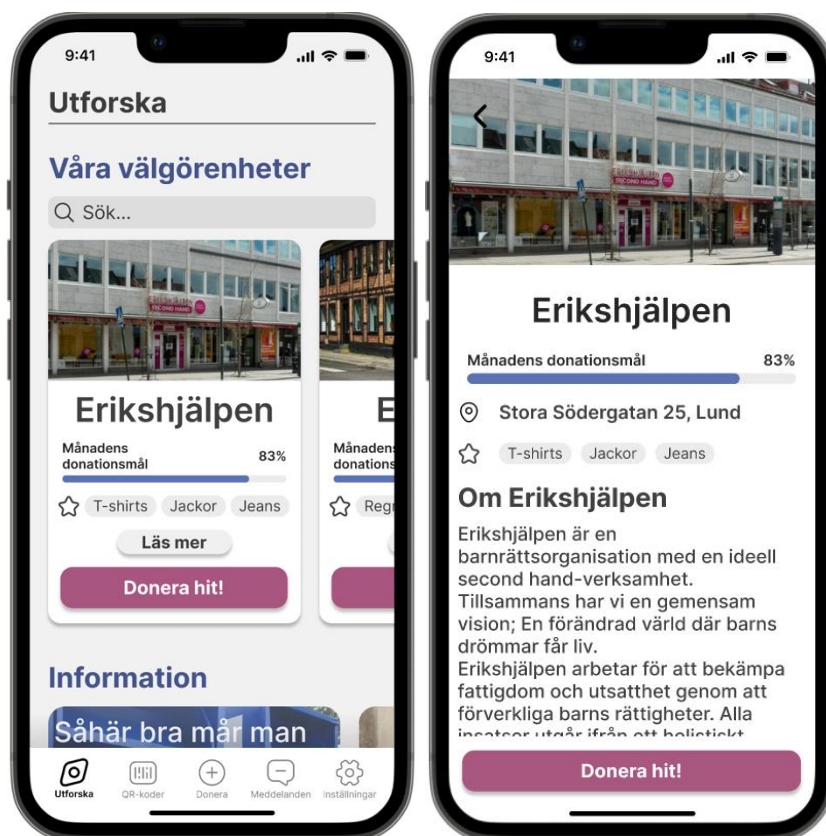


Figure 6.4. The charity cards and the informational overlay.

Further down the *Explore* page, the user can find an informational carousel which presents information regarding the charities and their work, the personal benefits of donating and the textile recycling industry. The informational frame containing the Swedish population's donation activity, implemented in the social version of Sprint 4, is also available.

At the bottom of the page the user also finds a carousel containing helping frames where the user can receive information about certain functions of the application, information about how to make their donation worthwhile to the charities, etc. There is also a frame that is intended to incorporate frequently asked questions. None of the frames contain any information themselves, other than what is portrayed in Figure 6.5. However, they can be expanded so the user can partake in all the information. This was done to save space on the *Explore* page and not overload the user with information.

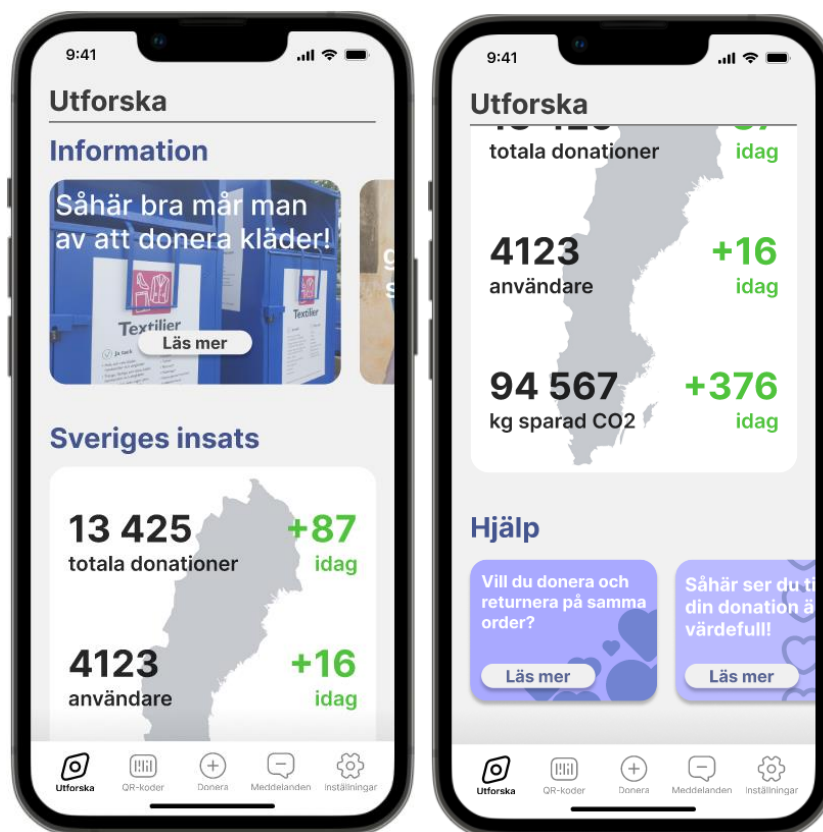


Figure 6.5. Information, the map of Sweden's contribution, and frequently asked questions.

6.3 Donate

The *Donate* function can be accessed through several different ways, as described in the previous section. The user can donate through the carousel of charities on the *Explore* page, the expanded informational overlay of the charities, and the *Donate* button in the banner menu at the bottom of the screen. Tapping any of these will expand the donation window, which prompts the user to choose a charity to donate to and a package to use for their donation. The monthly donation goal is displayed for each charity. Additionally, the size of each package is presented to allow the user to determine which package is the most appropriate for their intended donation.

After having chosen a charity and package, the user can tap the “*Bekräfta*” button to register their donation. The user can then proceed to either the *Explore* page by tapping the “*Klar*” button, or the *QR-codes* page by tapping the “*Se QR-kod*” button. All features of the *Donate* function can be seen in Figure 6.6.

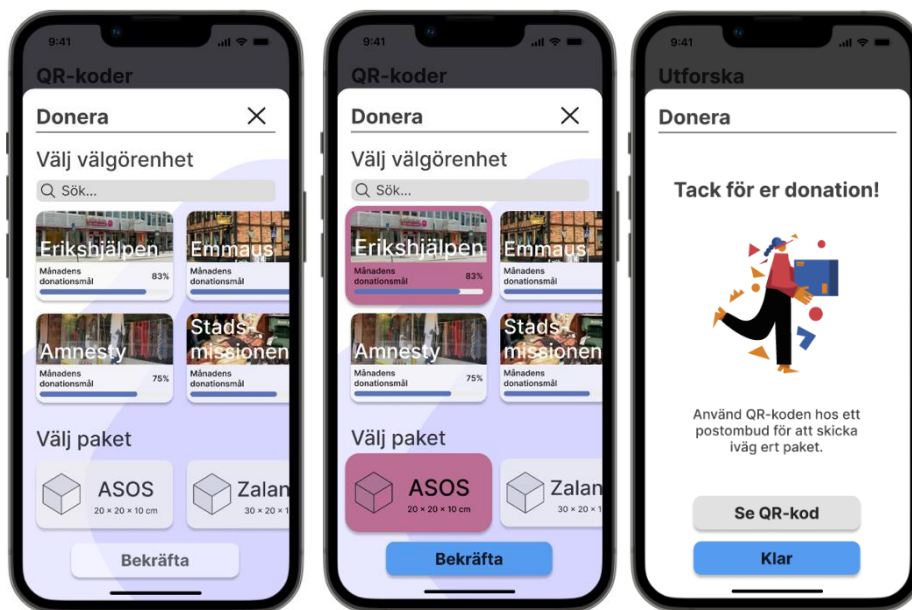


Figure 6.6. The *Donate* function.

6.4 QR-codes

In the *QR-codes* tab the user can access their QR-codes, which serve as digital shipping labels. The user can present these at their post office to ship their donation. If a QR-code has been recently generated, it features a red dot to serve as a notification to the user. The QR-codes are presented in a carousel and are intended to be removed automatically after two weeks (see Figure 6.7).



Figure 6.7. QR-codes, with and without a notification.

6.5 Messages

The *Messages* function features all the messages sent to the user by charities, e-retailers, and PassOnLine. Here, the user can find feedback regarding their donation as well as any rewards attained by using the application. The reward function was implemented due to the extrinsic version of Sprint 4 being well received by both the participants of the user tests as well as the online questionnaire. However, as to not overrule the intrinsically driven nudges that were implemented, the rewards were only implemented in the *Messages* tab. The user is alerted by a message if any rewards are available to them, and the rewards are sent to them in the *Messages* tab. These features are shown in Figure 6.8.

The implementation of both extrinsically and intrinsically motivating aspects is discussed further in [section 7](#).



Figure 6.8. The *Messages* function, showing the emotional message and reward.

7 Discussion

In this section, the development process and results of the project are discussed. It is segmented into discussion regarding the application and implemented nudges, a general discussion of goals etc., the strengths and weaknesses of our evaluation process as well as discussion of future work.

7.1 The Application

By reason of a user centered approach, the evaluation of each iteration was conducted through user tests and questionnaires, which are time consuming but grant valuable feedback and insight. For this reason, only a moderate amount of time was spent on literature research to allow for more resources to be allocated to developing and testing the prototype. Other topics regarding the final prototype are addressed below.

7.1.1 Requirements

The following desirable requirements were not implemented in the final version of the prototype, the reasons for which are detailed below:

- *Let the user input information about their donation, such as amount, condition, color etc.*
This would benefit the charities as they would be able to predict the contents and quality of incoming donations, making sorting much easier. However, this requirement was disregarded because it would result in a long donation process for the user with a large number of steps. This could result in fewer overall donations, as our data research clearly shows that our demographic clearly wishes for a simple and easy donation process.
- *Provide the user with additional feedback, e.g., the amount of money raised for charity, kilograms of carbon dioxide saved, etc.*
This requirement was not included simply because it was deemed impossible to implement with today's technology and logistics. Providing the user with such detailed feedback would require a tremendous amount of resources and was therefore neglected.

- *Present the option to donate clothes at check-out.*
This requirement will be discussed further in future work.

7.1.2 Excluded Functions

Some elements of the final prototype were not functionally implemented. The informational frames on the *Explore* page are intended to be expandable to allow the user to access more information. This function was not included in the final iteration. Additionally, only three charities can be donated to using the *Donate* function. The remaining three are dummies. The messages in the *Messages* page as well as the settings in the settings page are also dummies. Our reasoning for not applying these functions is because they are not essential for the overall functionality and understanding of the application. Furthermore, during the user tests, very few participants attempted to tap on these components. The time constraints of this project also influenced the decision to exclude the functionality of these elements.

There are also functions that we believe to be beneficial to the application that were not implemented due to time constraints. The ability to edit and/or remove a specific QR-code would help the user recover from errors and avoid frustration. Additionally, a shortcut to the most recent QR-code on the *Explore* page would likely aid the user when they intend to ship their donation at the post office agent.

7.1.3 Social and Emotional Nudging

Our data from the final user tests show that it is rather difficult to separate emotional nudging from social nudging, and these nudges often spill over into other contexts. In our case, emotional nudges can induce motivation of the type belonging through making the participants feel like they are a part of a larger cause by donating, i.e they have a sense of belonging to that cause. Likewise, social nudges can induce a feeling of guilt for not conforming to the portrayed norm of donating clothes, which corresponds to the motivation type sensation, i.e negative and positive feelings regarding donation behavior. With this, distinguishing between these types of nudges and implementing a purely social and emotional version of the application is difficult, and users are bound to be motivated differently by these nudges.

7.1.4 The Social Version

The social version presented in Sprint 4 was poorly received by the participants of the final user tests and the online questionnaire. They expressed a disliking towards the *Stories* function, where the user can see their friends' donation activity. It was stated that it makes the application stray away from the main purpose of donating clothes. It was more perceived as a social media application. Paradoxically enough, the inclusion of social functionalities such as *Stories* made the application feel more individualistic, according to our data. The participants expressed that it felt more exposing and competitive, rather than inspiring and motivating. However, they also showed an appreciation for the informational frame portraying the Swedish population's total amount of donations, users and saved kilograms of CO₂. This function was included in the final version of the application.

During development of the social version, we unconsciously strayed away from the main purpose of creating a donation platform and instead included too many functions similar to that of social media. Thus, one could argue that the social version was at an unfair disadvantage compared to the extrinsic and emotional version and that the final evaluation is skewed in their favor. For a more accurate representation of their impact, more research on social nudges should be conducted in the future.

7.1.5 Extrinsic and Intrinsic Motivation

Studies have shown that extrinsic motivation can have an undermining effect on intrinsic motivation. If an individual willingly performs a behavior due to intrinsic reasons and is then offered an external reward, the intrinsic motivation to the behavior declines (Legault 2016). The reason for the inclusion of extrinsic motivation in an otherwise intrinsically motivating application was data from the data analysis phase as well as the results from user tests. The collected data and results showed that extrinsic rewards are desirable for our user demographic, and it was received well as a method of motivation. We theorize that discounts and rewards can be employed to extrinsically motivate users to download the application and use it for the first time, or first couple of times, whereas the implemented intrinsically motivating aspects can help induce a continuing behavior of donating clothes to charity. It was therefore decided to include rewards in the *Messages* tab, with the intent being to extrinsically motivate users every now and then in order to encourage users to use the application. The hope is that the intrinsically motivating factors will then influence the user sufficiently to form a long-lasting donation behavior. To confirm this, further research is needed.

7.1.6 Misusing the Service

Furthermore, there is a risk of the donation service being misused. As stated in section 1.4, we assumed the service to be free of charge for the user. Additionally, our user research shows that very few participants were willing to pay for this service. Should the service be free, problems regarding the quality of donations can arise. If the user decides to make a very small donation, the cost of logistics can exceed the value of the donation. It is therefore important to make sure that the user is informed about acceptable quality and donation amounts. This was also addressed in our prototype by including information on how to make one's donation valuable. Additional measures can be taken by for example including some form of binding agreement that the user must sign in order to proceed with using the application.

7.2 General Discussion

The inherent nature of the application as well as the time limit of the development process resulted in some topics of discussion. These include the methods and goals of the process, nudging, creating value for the three stakeholders, as well as greenwashing.

7.2.1 Discussion of methods

The methods used for development of the final prototype were FESP and the Double Diamond method, combined with a user centered approach. The development process of these two methods do not align perfectly in chronological order but were combined without difficulty through iterative work. For development of the prototype, we used the sprint method to divide each iteration into a two-week period consisting of development, testing and evaluation. Each iteration was focused on a certain aspect of the prototype, and the goals were clearly defined for every sprint and were in line with the overall objective of the project. This resulted in a planned and controlled manner of development.

7.2.2 Feasibility of Goals

According to BJ Fogg's eight step process (2009b), the designers should choose a small, measurable and feasible goal at first and only once that goal has been met should the team expand the development. The goal set at the beginning of this project was to develop a high-fidelity prototype and provide research on how to motivate users to donate clothes to charity. Due to the vague nature of people's

motivation and the difficulty of measuring motivation, this can be considered a larger goal than what Fogg recommends. However, for the purpose of this master thesis not consisting solely of development work, a larger and more overarching goal was required. Overall, we consider that the goal of developing a high-fidelity prototype and conducting research on user motivation was fulfilled.

7.2.3 Nudging in Later Stages of Development

The first iterations of the interface include little to no persuasive methods. Our reasoning for this was that the focus of the first iterations was to improve the functionality of the application. A functional and well-designed application is more pleasant for the user, and shortcomings in functionality can be distracting from implemented motivational aspects. As shown by the study by Mane (2022), presented in [section 3.1.4](#), the quality of a website can even have a positive impact on users' willingness to donate. Thus, nudges and other functions with intent to motivate were implemented in the later versions when the foundation of the application performed well in user testing.

7.2.4 Value for Other Stakeholders

There are certain aspects of the application that do not pertain to any specific requirements or heuristics, for example the choice of package in the donate function. This does provide the user with the parcel size so that they can determine the volume of clothes they can donate using that specific package. However, the main reasoning behind this implementation is to benefit the e-retailer through extending the customer contact beyond the delivery of the package. As stated in the introduction section, we aimed to create value for all of the stakeholders mentioned by the authors of *Towards Circularity in E-commerce* (Hallgren & Hedelin, 2022). While our focus was on the customer experience, we designed the application to make sure that it catered to the needs of the other two stakeholders, namely e-retailers and charities. These needs were recorded during the data analysis and are presented in [section 3.4.3](#), but not included in the final compilation of requirements as they are not central to our primary user group. The aforementioned extension of customer contact is also implemented in *Messages*, where the user can receive a message from the e-retailer, expressing their gratitude for using their package. The needs of charities were also addressed by including information about their work in *Explore*, and inherently through the entire application as it facilitates donation of clothes to these charitable organizations.

7.2.5 Greenwashing

Beyond the scope of user experience, there are some drawbacks of the general concept of the application. For starters, the need to purchase a new item in order to be able to use the donation function is contradictory to the circular economy mindset that the application is meant to encourage. This was partly amended by adding an informational frame to the *Explore* page with information of how to donate without making a purchase. This issue should be addressed further in future work.

7.3 Evaluations

The evaluations of this project were all conducted through user tests and questionnaires due to our user centered approach. This comes with benefits and drawbacks, which are further discussed in this section.

7.3.1 User Tests

Our evaluations largely consisted of user tests. This has the benefit of generating first-hand information regarding usability problems. However, arranging user tests and assessing the results of them is a very time-consuming process. During early development, it could have been beneficial to apply different methods of evaluation, for example expert consultations or heuristic evaluations and walkthroughs. These are methods that also help identify usability problems by referring to a set of guidelines called heuristics, without involving the users themselves (Sharp et al., 2019, 550). This would have saved us a lot of time during the first stages of the design process, where these methods would have been sufficient to make design decisions. However, performing user tests ensured our user centered approach and granted us great insight into the design problem throughout the entire process.

7.3.2 Sample Size and Convenience Sampling

Because of the large number of user tests, the sample size was kept small to accommodate for rapid testing and iteration. Each test included between five and eight participants. The test persons were recruited using convenience sampling, which means the sample includes those available at the time rather than specifically selected (Sharp et al., 2019, 261). This allows for faster testing but comes with the drawback of not being able to generalize the results (Sharp et al., 2019, 284). To address this issue, we could have complemented the user tests with

another method of collecting data, for example questionnaires. An approach similar to the evaluation of Sprint 4, where an online questionnaire was distributed to gather more data, in addition to the final user tests. This resulted in a larger and more demographically varied sample group which is more suitable for generalization. However, this of course comes with the drawback of being more time-consuming, which is a consideration that must be taken into account.

7.3.3 Long Lasting Effects of Nudging

During the evaluation of Sprint 4, we aimed to determine what type of motivation (belonging, sensation or anticipation) and nudges that are most effective at persuading people to donate clothes to charity. Our results indicate that emotional nudging, i.e sensation, was the most effective way to motivate users to donate clothes to charity. However, we were not able to determine the long-lasting effect of these nudges due to the time constraints of the project. The prolonged effect of nudges is notoriously difficult to study and requires investigation over longer periods of time as well as controlled contexts and settings. As mentioned in [section 3.1.2](#), intrinsically motivated behaviors tend to be longer lasting than extrinsically motivated behaviors. The final prototype includes both of these types of motivation, with more focus on intrinsic motivation, which indicates that our application will induce a continuing change in donation behavior. However, this is no guarantee that the behavior will last and should be confirmed in the future.

7.4 Future Work

There are fields that were not explored due to time constraints and the scope of the project. These include the users' data, functions that were not implemented in the final prototype as well as interaction between the other stakeholders (e-retailers and charitable organizations), and they are discussed in this section.

7.4.1 The Users' Personal Data

In our assumptions we stated that it is assumed that access to the users' personal data is available, as that information is necessary to be able to generate the QR-codes needed to ship the donations. Handling the privacy of the users was not included in the scope of this project but needs to be considered for future work.

7.4.2 Personalized Feedback

Personalized feedback is both supported by literature and our user tests to motivate users to perform charitable acts. Gough and Hamilton (2013) emphasize the importance of prioritizing what information an application provides. The information must be timely, appropriate and reliable, i.e customized to the user and their personal preferences. The participants of our tests stated that they would feel motivated by receiving more tailored feedback on their donation. Our controlled user tests and the SDK we used to develop our prototypes were limiting in regard to personalizing the feedback experience, meaning that little information was gathered on personalized feedback. For future development, we recommend researching the effects of personal nudging and feedback on users' willingness to donate.

7.4.3 Triggers

According to FBM, for a behavioral change to occur ability, motivation and triggers must be present to some extent. The data collection showed that physical, cognitive and emotional ability to donate is present in our user demographic. Our development project was focused on motivating the users to donate, meaning that triggers are left unexplored. While some of the implemented nudges can be interpreted as triggers, they were intended to motivate users. For example, one could argue that the entire application is a facilitator trigger, as it simplifies the process of donating clothes to charity. However, the effect and implementation of triggers should be considered for future development, as they can improve the users' overall willingness to donate. For instance, signal triggers that remind the user to perform the intended behavior, i.e donate clothes to charity, can possibly have a positive impact and should be considered. Furthermore, facilitator triggers and spark triggers should also be examined for future development.

7.4.4 Implementation in Check-Out

We believe that presenting the application to the user already at checkout when purchasing clothes online would be beneficial. It would not only help the user better understand the purpose and functions of the application as it can be briefly described during checkout, but also improve their overall willingness to donate clothes to charity. Our reasoning behind this is that introducing the application at checkout can be utilized as a trigger, more specifically a spark trigger. This is also supported by our user research, with users even suggesting that the application is presented when buying clothes online. We therefore recommend that a checkout experience is added to the service.

7.4.5 Interaction Between Other Stakeholders

As stated in [section 1.3](#), this project only covers the interaction between the user and the interface. The interaction between the other stakeholders, i.e. e-retailers and charities, was neglected. As these stakeholders are very central to the entire service, their interactions with potential interfaces should be studied. For example, the charities stated that there is a need to predict and control the inflow of clothes to make sorting easier. This means that they would benefit greatly from an interface that allows them to monitor incoming donations. Therefore, we advocate for research on the other stakeholders' interactions being conducted, and subsequently developing prototypes of suitable interfaces.

8 Conclusion

The final section presents the concluding remarks of the thesis project regarding the process, findings, fulfillment of objectives, and key takeaways.

This master thesis explored interactive solutions that motivate users to donate clothes to charity through behavioral and persuasive methods. The objective of this project was to develop a high-fidelity prototype of an interface that allows users to donate clothes to charity in conjunction with a purchase from an e-retailer, whilst generating value for the stakeholders established by the Hallgren & Hedelin (2022) in their master thesis “*Towards Circularity in Fashion E-Commerce*”. Additionally, methods of motivating users to donate were examined.

We used the Double Diamond process as well as Fogg’s eight step process as a framework for the development of the application. A user centered approach was also adopted, as the project was focused on the user’s interaction with the application. General design guidelines, such as Nielsen’s ten usability heuristics were also employed throughout the process.

The result is a final prototype that facilitates the donation process of the user and offers feedback regarding the user’s donation. It also serves as a platform where the user can take part in information regarding charitable work, textile recycling, and the personal benefits of donating. The implemented functions are intended to motivate the user to donate clothes to charity through various persuasive means, with focus on intrinsic motivation.

Our findings are verified through user tests executed after each iteration of the application. These tests indicate that the implementation of intrinsically motivating aspects of the application, including providing information about the work of the charities, and emotionally charged feedback, will increase motivation of users, and thereby the likelihood of them donating clothes to charity. Additionally, an extrinsic reward system with discounts on purchases is implemented to motivate potential users to download the application.

Key takeaways and insights from this project include the benefits of frequent user testing and rapid iteration, as well as the difficulty of dividing persuasive aspects into clear categories. The user tests performed during the development work always proved helpful, granting us valuable insights and feedback regarding the usability, design and persuasive methods of the application. Thus, if resources are available, user tests are an excellent method of evaluating and verifying results and iterations. Rapid prototyping also proved useful for our project. We saved a considerable amount of time by not overdeveloping functions and aspects that had not been evaluated or verified. Finally, we found that dividing motivation and nudges into categories to be difficult. Different nudges and motivational factors often spill over into other types and contexts. Thus, distinguishing persuasive aspects that purely refer to *belonging*, *sensation* and *anticipation* (as described by FBM) was troublesome.

In conclusion, the objective of developing an app that facilitates the donation process and motivates the user to donate clothes to charity was achieved and verified through user tests. Value was generated for every stakeholder. By extending the customer journey and association with a circular economy, the e-retailers' needs are fulfilled. The charitable organizations will likely receive an increased controlled inflow of quality donations through the implementation of this service. Their work is also presented to their user demographic. Finally, the user's donation experience is enhanced by an application that simplifies the donation process and provides feedback on their donation. With this, we have presented a solution to the PassOnLine service in the form of an interactive prototype, as well as our research results on suitable behavioral and persuasive methods.

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