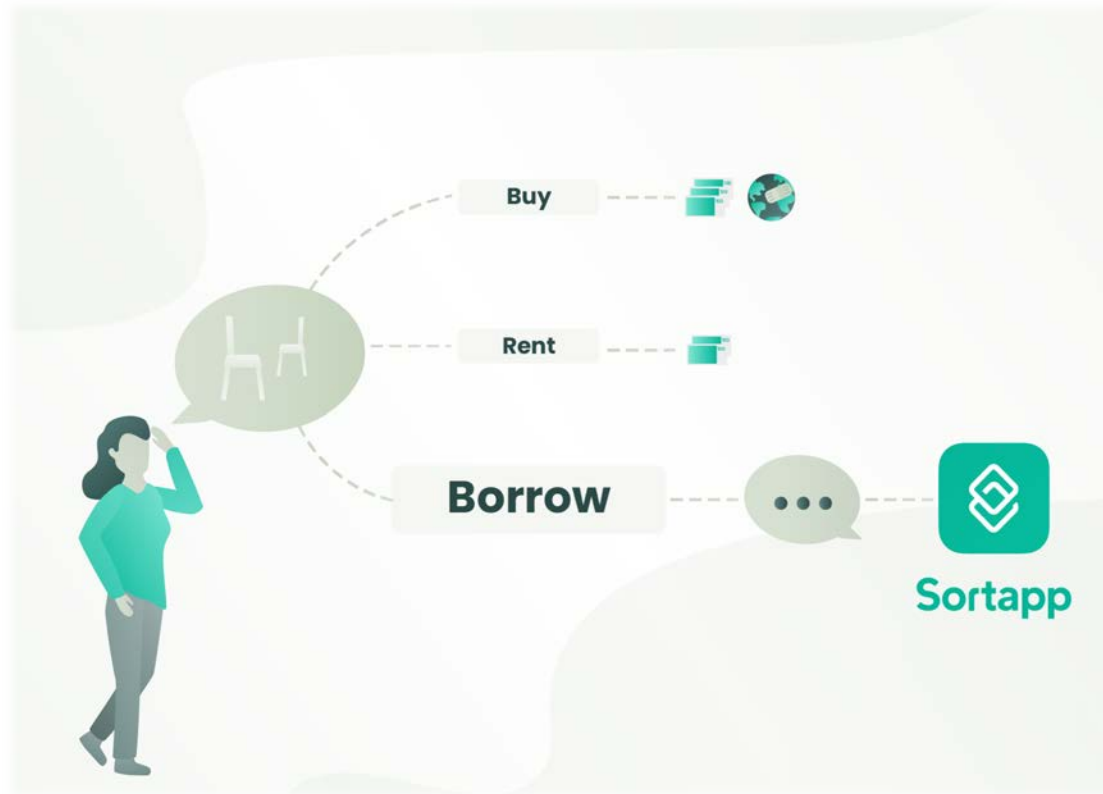




CHALMERS

UNIVERSITY OF TECHNOLOGY



Improvement of an inventory management app and development of a sharing feature

Master of Science Thesis in the master's degree Program, Industrial Design Engineering

OLIVIA CHALANDON
PATRICIA LINDBORG

CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenburg, Sweden 2019

Department of Industrial and Materials Science
Division of Design & Human Factors

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Abstract

The thesis has been conducted in collaboration with the startup company Sortapp, with support from FutureMemories AB, at the division Design & Human factors at Chalmers University of Technology. Sortapp is an app in development and on its way to be released, with a purpose to be used as a smart way to digitally organize one's home inventory. The ability to reuse stored items by sharing this information through the app, leads to having a better overlook of one's belongings. Sortapp aims to reduce the overconsumption and support a new movement towards a circular economy by encouraging people to reuse items stored away.

The initial aim of the project was to ensure that the main functions in the existing application work fluently, generating a coherent and intuitive app. Secondly the aim was to explore how the application, Sortapp, can be further improved by identifying user needs and conducting various user tests and interviews to translate the needs into new useful features to include. In addition to improving the foundation, exploring ways of how to include and develop on added sharing feature has been completed to support Sortapps aim of offering a sustainable option of obtaining products.

The results from the different studies on Sortapp v.1.0 lead to insights on what needed to be changed for the app to be ready for a release. The gathered data about if and how people share belongings, showed a demand in a communication tool, presenting an accessibility of items to borrow, representing the first part of the sharing journey. These insights and results were prioritized in a journey map and were further refined to issues that were translated into features, to add to Sortapp. The first two features were generated from Sortapp v.1.0 basic feature of adding an item to a storage, the third to communicating the availability of sharing an item is an obstacle people encounter today, the fourth feature is similar to the search for an item to see what the contact has chosen to share with the user and lastly, the final feature is a solution gathering information about various changes in the app:

- Adding an item and sharing
- Adding multiple items and sharing
- Search for an items/boxes/storage to borrow
- Search for a certain contacts items/boxes/storage
- A notification center gathers received information about items/boxes/storage

Ideas and concepts were designed based on the found issues to facilitate the interaction with the app. An evaluation of the features was conducted by testing prototypes on potential users. The final concept including all five features is presented as a result of the evaluation and is a representation of the thesis outcome.

Acknowledgements

This master thesis was carried out in the spring of 2019 at the division of Design & Human Factors, at the department of Industrial & Materials Science at Chalmers University of Technology. The project covered 30 credits and was performed by two students from the Industrial Design Engineering Master's program, for and in collaboration with the startup Sortapp.

Firstly, we would like to give our warmest thank you to Göran Gratte for giving us the opportunity to participate in the development of your application, Sortapp. Your engagement, positivity and support in this project has been encouraging and uplifting. We would also give a warm thank you to Victoria Wånsander at Sortapp/FutureMemories, that has acted as our supervisor and has guided us within UX. Your input and feedback have been truly valuable, and we appreciate all your time and effort spent guiding us. Thank you to everyone at FutureMemories who has participated in this thesis. We are grateful for all your feedback we have received throughout the project.

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Gothenburg June 2019



Olivia Chalandon



Patricia Lindborg

Terminology

UI- User Interface, is a channel between human and computer interaction – the space where a user will interact with a computer or machine to complete tasks.

UX- User Experience, design is the process of creating products that provide meaningful and relevant experiences to users.

Usability- Usability is a quality attribute that assesses how easy user interfaces are to use.

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01.

Introduction

The chapter will present a clear overview of the project. Introducing the company and what their goal and vision is for Sortapp. A presentation of thesis aim and objectives to support and contribute to Sortapps goal.

Background

Climate change and global warming has been a widely discussed topic. Our way of living has a great negative impact on the environment (Allen, O.P. Dube, Solecki, Aragón-Durand, Cramer, Humphreys, Kainuma, Kala, Mahowald, Mulugetta, Perez, Wairiu & Zickfeld, 2018). The earth's resources are finite; however, we are using resources as they were infinite. A solution to our finite resources is to re-use them. The long overdue linear approach needs to take on a circular and restorative approach for a more sustainable future (Andrews, 2015). The circular solution has been adapted to production processes and is known as circular economy. The circular economy is a term to help companies re-use and not dispose of the resources they have obtained by designing out waste and pollution, keep products and materials in use, regenerating natural systems (Ellen MacArthur Foundation, 2017).

An important factor that directly contributes to the climate change is consumerism. The consumer class is estimated to consist of 1.7 billion people and household consumption is said to have 60-80 percent of an impact on the planet (Dr Shukla. J, 2018, 16 July). These facts all show how important it is for us all to re-evaluate our consumption behavior. To reduce negative impact on our planet we have to decrease overconsumption.

"We are currently using up the renewable resources of 1.7 earths - unless things change, we'll need three earths by 2050"

- (Population Matters, 2019)

Sortapp aims to reduce the overconsumption and support a new movement towards a circular economy. It is an application in development on its way to be released. Sortapps goal is to be used as a smart way to digitally organize one's home inventory and sharing it with others. Being able to reuse stored items by sharing this information through the app and having a better overlook of one's belongings.

By organizing one's home inventory in Sortapp, it enhances the control over belongings at home whenever and wherever. For example; friends who are going on a ski vacation, asking around to borrow ski boots, it is easy to simply share a picture of the shoes and information such as size to let them choose if they want to borrow or not. The app will not only help decrease overconsumption, when sharing instead of buying. It will help reduce the negative impact on the environment by promoting a consumer circularity. Another example of use can be sharing a family storage; in a family summer house, where different people can help organize belongings by adding and removing items, storing them in various boxes, giving easy access to all users.

Today Sortapp is composed of the main functions concerning the goal of organizing one's home inventory. The determined and realized features and functions are listed below and shown in figure 1:

- Creating accounts- Pictures, names, mail etc.
- Creating storages, boxes and items- Pictures, location and notes.
- A minor option on sharing storages with other Sortapp users.

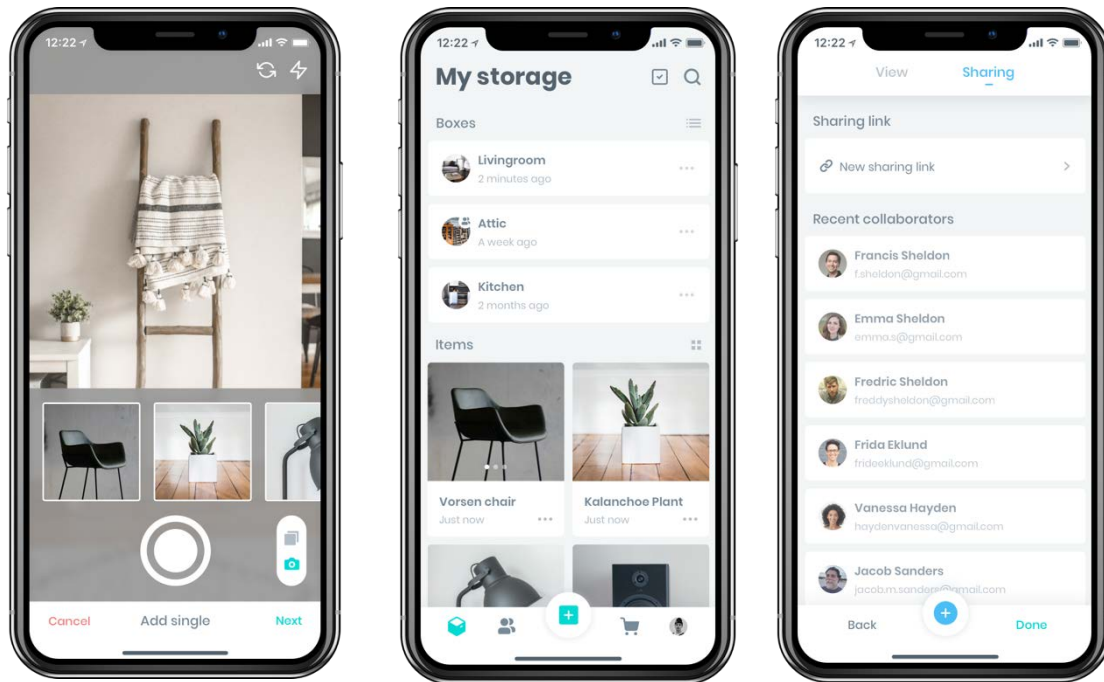


Figure 1. Prototypes done by Sortapp.

Further developments in relation to the mentioned features are planned to be conducted before Sortapp releases the app. The initial aim of this project is to ensure that the main functions mentioned above work fluently therefore the project begins with generating a user friendly app. Secondly the user study leads to the important insights of how the application can be further developed during this project and a conceptual design of the developed app is presented.

The company backgrounds

Futuresaurus AB is a startup company founded 2017 in Gothenburg, Sweden. The company has developed an application, Sortapp, together with a consultancy firm for digitizing and organizing home inventories. Similar applications exist today; such as Shpock, an application with a main focus on selling second hand, promoting a circular economy and Sortly an application to help people organize home inventories. The development of new apps, helping people organizing homes, shows a great demand

and need in this area. Sortapp's vision is to combine the organizing function with a share and sell function to support a circular economy for a sustainable future.

1.2 Aim

This project aims to explore how the application Sortapp can be further improved and adapted to the users' needs. To identify the user needs, various user studies, user tests and interviews are completed. Secondly, the user studies are to be used as a foundation for the development, by translating the needs into new useful features to create a conceptual design to present.

1.3 Objectives

The project aims to deliver the four objectives that are listed below:

- Identify relevant users before a launched product.
- Identify needs people have and what/how people do when managing, sorting, storing and sharing products they do not use.
- Identify and prioritizing functions that are relevant to include in the app to meet user needs.
- Create a finalized concept with functions based on the user needs and theoretical studies.

The objectives are handled in a parallel and overlapping manner. This is due to the many inputs the project receives from Sortapp/FutureMemories during the process as they also work on improving the app.

1.4 Demarcations

Helping Sortapp to develop their app will include several process steps, some which will not be touched upon by this project: Programming will not be a part of the project as this task has been given to other partners. A finalized market analysis of the app will not be completed during this project as it is not part of the aim and will not be useful in the investigation of the objectives listed above. A final design delivery will not be conducted, but design concepts and ideas will be presented in the end of this project.

1.5 Ethical issues

During the project some ethical issues can be encountered, mostly regarding the user studies and the aspect of not displaying confidential information about the existing app. Issues regarding the GDPR-law has to be considered during the entire user study, it is important to acknowledge the privacy of the test subjects. The participants are given the option to leave the study if they are uncomfortable in continuing, to select

what data they are willing to share and present in the project and lastly the choice of being anonymous.

Ethical considerations regarding the company also have to be recognized during the user studies and confidential information is not to be shared with anyone, as agreed. Many other ethical aspects considering material choices, manufacturers and manufacturing techniques are not a part of the development process of the app and therefore are not vital to consider. The most important factors are to withhold sensitive information regarding the company and the app as well as respecting the privacy of the test subjects.

1.6 Project process and report structure

The report structure is divided into seven main chapters describing the project, process and result, see figure 2. The first chapter is an introduction to the project scope. The second part consist of a pre-study on circular economy, consumption and sharing, as well as a study of existing applications. Chapter three describes the first phase of the project which consists mainly of user studies involving the organizing and storing part of Sortapp. This is accomplished by identifying problems in the app (v.1.0) as well as trying to understand the user needs when storing belongings. Chapter four describes the second phase, the sharing function Sortapp has a vision of adding to the app in a near future. The phase consists of analyzing user studies from phase one, on the issues and pains found, also trying to understand how people share belongings and what problems and obstacles arises when doing so. Chapter five is a presentation of ideations and concept generations as well as an evaluation of the designed and tested prototypes. The sixth chapter of this report presents the final concept, a presentation of the developed prototype that is generated from the results identified and prioritized in the three phases. To conclude this report a final chapter representing the thesis discussion and conclusion is presented.

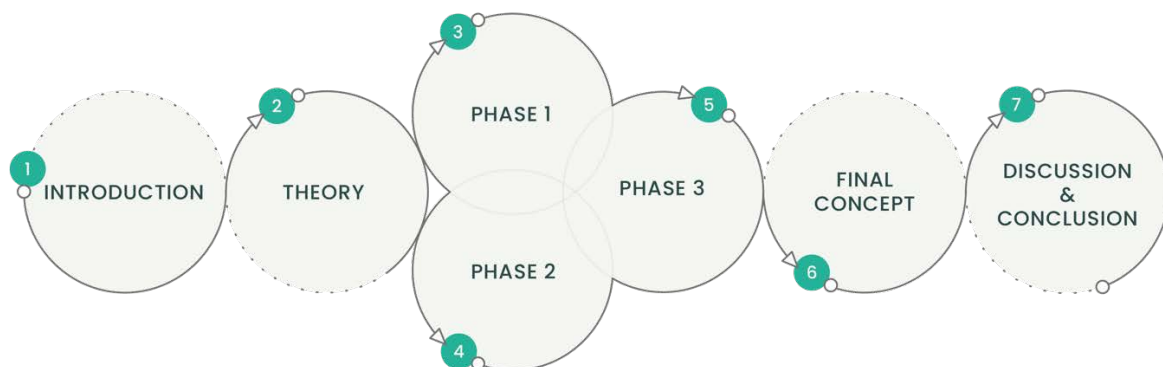


Figure 2. Illustration of the report structure.

The process of this project follows a general design thinking structure, exploring the problem space and exploring the solution space. The five main elements of design thinking; empathize, define, ideate, prototype, evaluate, are implemented in the project (Think 360, 2016). The three phases overlap each other, as seen in figure 3, and the results from each phase lead to the next phase.

- The first phase is iterative, thus new input and tasks from Sortapp is given throughout the project to be tested and evaluated. This phase gives insights on how to improve the app v.1.0, what design features are intuitive and crucial to develop to create a positive experience. The elements of design thinking that are present in this phase are empathize, define and evaluate. These elements are applied to Sortapps design foundation to ideate new solutions to improve the use of the app. The outcome work as tools to guide the project in the third phase, designing concepts. In addition, the first phase shows how to approach the second phase of the project, adding a sharing feature to Sortapp.
- The second phase presents the projects work on how people share today, what difficulties a sharing process consists of and why. Emphasizing the problem to understand people's experiences and motivations when sharing, defining the problem by analyzing the gathered data to finally ideate solutions in the third phase.
- The third phase focuses on how to create and design new ways of solving the problems of sharing one's belongings. This was also completed together with the outcome from phase one on how to design an intuitive app. As well as ideating design solutions, analyzing the concepts is completed by prototyping and evaluating the developed features.

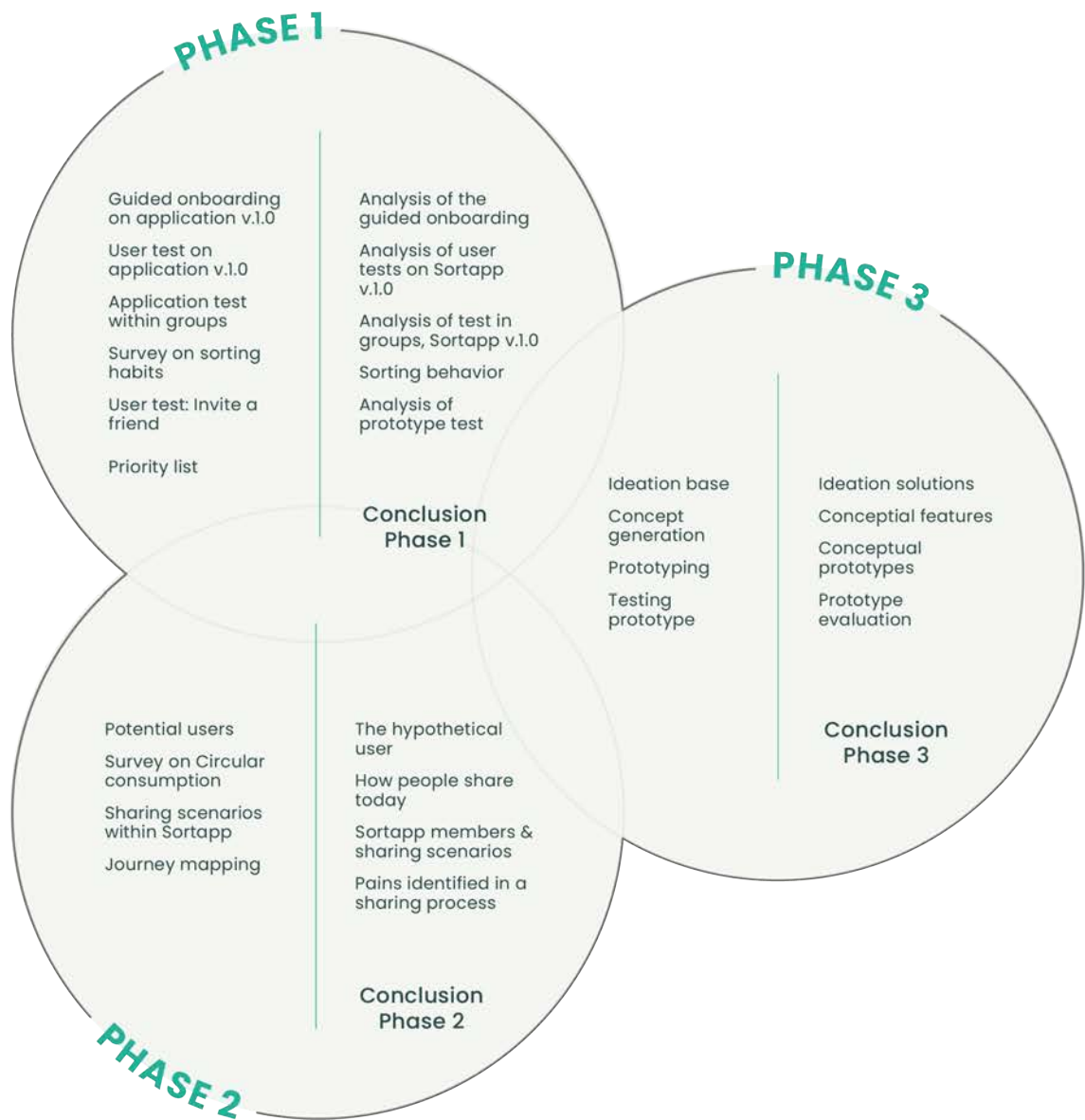


Figure 3. Illustration of the three phases including methods and results.

02.

Theoretical studies

The chapter presents the theoretical facts needed to understand the basis of the project and the purpose of creating the application Sortapp with a sharing feature. Gaining knowledge on what circular economy is and the importance of it when designing products and services. A study on sharing products and a benchmark on apps with a similar purpose as Sortapp.

2.1 Circular economy

For a long time, the global economy has been linear, shown in figure 4. This economy has supported a take-make-use-dispose structure which require infinite resources. However, the world's resources are not infinite and with a growing population, increasing wealth, inequity and consumption a linear economy model is not sustainable (Andrews, 2015).



Figure 4. Illustration of linear economy model.

A new way of viewing the economy is in a circular process, where resources are reused. Optimizing flows and rebuilding capital by understanding and acknowledging that resources are finite (Webster, 2015 page 187). Product design will have to evolve and take on a restorative approach, aiming for highest utility and value of components and material (Webster, 2015 page 17).

The authors of Towards the circular economy describe the circular economy with a few simple principles;

- Designing out waste, which refers to developing and designing a product with a high utility when entering an end-of-life stage. Meaning that the materials and components of a product can be recycled and reused, and therefore resulting in more a sustainable environmental impact.
- Build resilience through diversity, this principle refers to building systems that can resist external shocks.
- Mimicking natural systems as they are adaptive to a changing environment.
- Rely on energy from renewable sources, producing and working only with renewable and sustainable energy.
- Thinking in 'systems' is a principle that considers different elements in relation with various factors within a system as well as surrounding a system.

Waste is food, reintroducing materials, biological nutrients and technical nutrients to the loops of restorative circular economy. In figure 5, a diagram of a restorative circular economy is illustrated showing the different aspects of biological and technical nutrients (Ellen MacArthur Foundation, 2017).

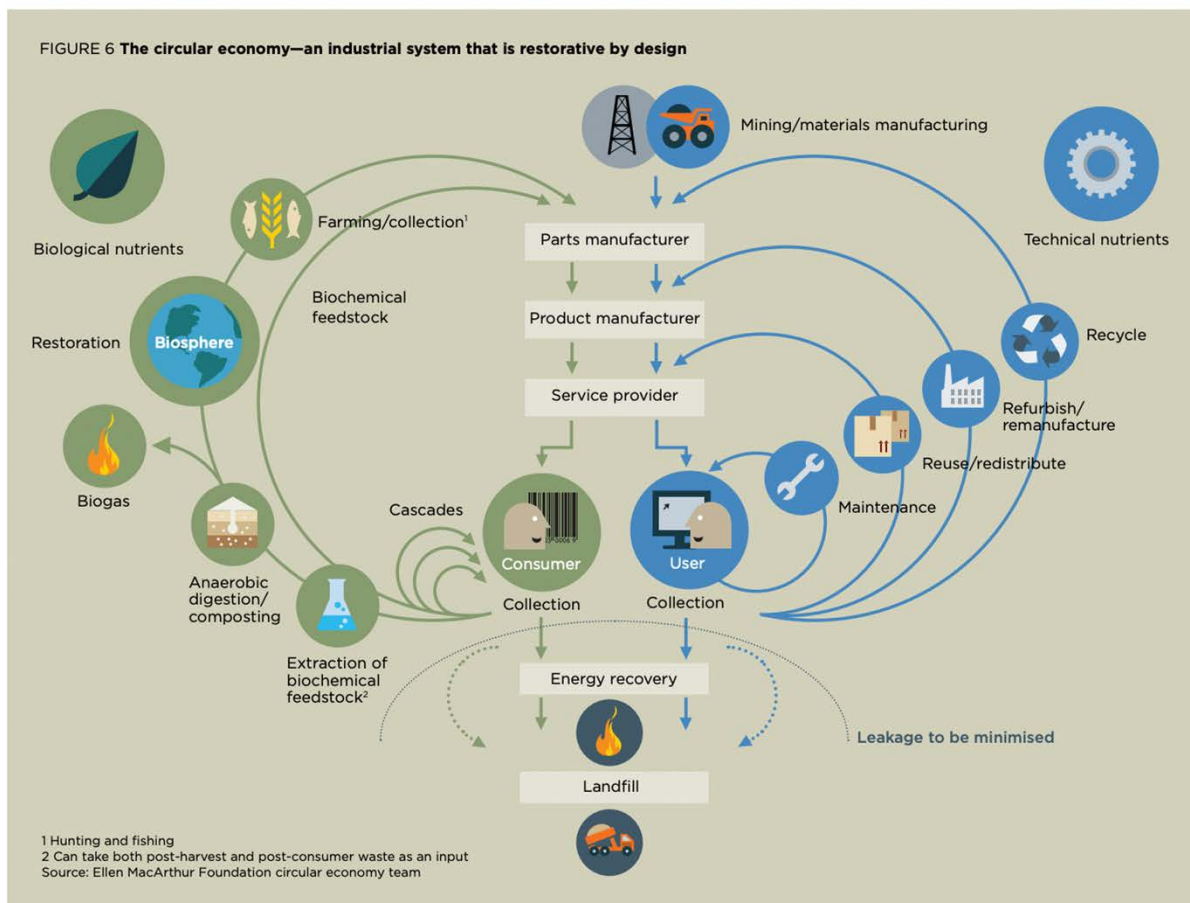


Figure 5. Diagram: Towards the circular economy (Ellen MacArthur Foundation 2013).

A circular economy requires that companies adopt this concept of restorative waste control. That product design offers effectiveness and performance in reuse, longevity, upgrade and repair of products for the end-users when designing for efficiency. This needs to be present in both production and consumption, for a more sustainable future (Esposito, Tse, Soufani, 2018).

Studying people's consumption habits is discussed in (Selvfors, Rexfelt, Renström & Strömberg, 2019) as a way of understanding products life-cycles. Understanding the circularity from a user perspective is important to consider when designing products, to fully recognize its end-of-life phase. The consumption cycle can be divided in three main phases; obtain, use, riddance. Similarly, to the circular economy approach, the three phases are developed from a linear and non-sustainable approach. By studying the obtain and riddance activities, important insights can be found to prolong the longevity of a product. A product can generate many life-cycles by being of use to many people. Figure 6 illustrates an example of a product having many lives by changing owners. To facilitate the transfer process of a product, from one user to another, exchange agents can be of great importance. Exchange agents can help communicate and deliver the product.

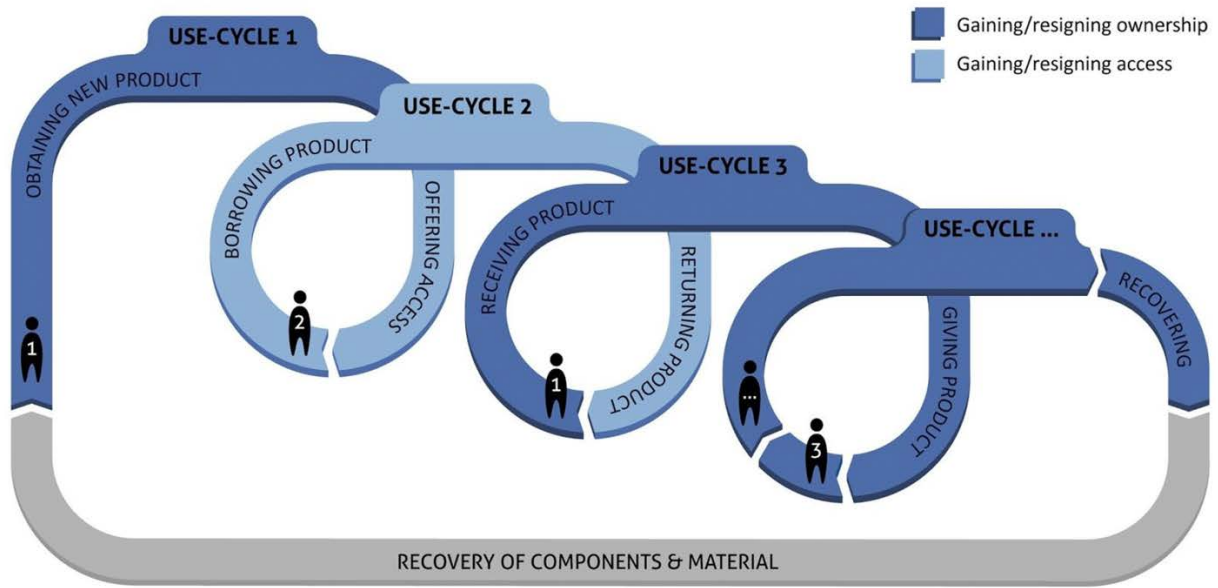


Figure 6. Illustration of a products multiple life-cycles when exchanged (Selvfors et al., 2019).

2.2 Sharing

Sharing items is a way of minimizing the consumption, an option of product obtainment instead of buying new items. The upcoming chapter presents different behaviors when sharing and various ways of sharing.

2.2.1 Sharing behavior

Sharing, also called, sharing economy, the mesh, collaborative consumption etc. has always been seen as an economical way of using items by lending or giving them away for others to use. This system has been used mostly when people are unable to afford new items themselves, but also when only needing an item for a one-time use (Naturskyddsföreningen, 2015). For the past years new businesses with an aim of implementing sharing systems have been and are continuously emerging. The company Airbnb is for example a platform for sharing, where people can rent out or rent apartments on a website and the property owner can earn an extra amount of money from the rental. This can, in many occasions, offer a cheaper stay for the guests compared to hotels (Airbnb, n.d). Another known business is Uber, a ride sharing app, where the drivers are individuals offering a ride in their cars for people wherever they like, similar to a taxi. All Uber users have a registered account on the app. Members can be rated, both as passengers and as drivers, which offers a safety aspect to the service. This way of sharing is becoming more frequent and can be applied on other services and products such as clothes and tools. There are clothes sharing days, libraries for clothes etc. Similar approaches are used for sharing items; rental applications, stores with rental opportunities etc. (Naturskyddsföreningen, 2015).

Sharing this way has become a trending behavior, as well as being more environmentally conscious. These two behaviors are a good combination and can thrive off one another (Naturskyddsföreningen, 2015).

2.2.2 Variations of sharing & reusing items

In addition to the ways of sharing represented in the section above, people use various ways of sharing and reusing items online, on websites and in applications. A few examples are listed below:

- Blocket is a Swedish website for selling items by publishing an advertise and sharing info about the item (Blocket, n.d).
- On Facebook there are closed groups that are created and specialized in sharing items and selling items (Facebook, 2004).
- Ebay and Tradera are websites/applications where people sell items all over the world, in the same manner as via Blocket (Ebay, 1995) (Tradera, 2004).
- Shpock is an app used to reuse items geographically, by selling items and geotagging them, for easy access (Teknik i fokus, 2016).

- Hygglo is a website where people rent/rent out items for a certain amount of time to a set price. The renters are geotagged to facilitate the rental procedure (Hygglo, n.d).
- Second hand stores, such as Myrorna, Emmaus, Beyond Retro etc. where people leave unused clothes and items for the stores to sell (Myrorna, 2019) (Emmaus, n.d) (Beyond Retro, 2018).

The list above represents only a few examples of platforms for reusing and sharing items, but as mentioned in Naturskyddsforeningen (2015), some thresholds when sharing and reusing still exists. It seems easier for people to order a drill online or go to well-known stores rather than to search on different website trying to find individuals to trust. Elements of frustration and annoyance can occur in for example feeling the need to wash second hand clothes before using. New ways of reducing such thresholds might favor the behavior of reusing and sharing instead.

2.3 Applications

The fastest growing market in consumer technology is mobile applications. This growth is related to the rising popularity of smartphones and tablets (Meng-Mei, Murphy, Knecht, 2016). Smartphone applications are used all over and the downloading of new applications increases every year (Statista, n.d.). During 2017 about 178 billion apps were downloaded in total and this number expects to increase. During 2022 the predicted number of downloads are about 260 billion in total. According to Janinge & Laninge (2017) App Store has 1,5 million applications and about 60 000 apps are added every month which a large amount is in regard to the fact that less than 60 percent of all applications are downloaded less than 1000 times (Janinge & Laninge, 2017).

“Mindre än 60 procent av apparna har inte ens laddats ner 1 000 gånger.”

- Janinge & Laninge (2017).

The usage of applications has increased immensely lately and today applications for dental appointments, healthcare, live streamed psychologist conversations are used frequently (Dagens arena, 2018). In the year of 2017, 9 applications were approximately used each day and in one month 30 applications were used in total per person. However, the usage differentiates between countries and some of the countries that uses smartphones the most are South Korea, Brazil and Mexico (Mobil, 2017).

Using an application instead of websites on the smartphones enhances the user experience as they are adapted to the size of a mobile screen and often have a better interface, which makes the interaction easier for the user (Mobil, 2018). Applications improve and evolve through updates constantly and the optimization will probably be

continuous with websites as well. Mobil (2018) claims that 85% of the Swedish population had used internet on their phone year 2017, which seems to increase.

2.3.1 Existing applications

By benchmarking existing applications, an increased understanding of interactions, interfaces etc. that work today can be gained, and the risk of duplicating current apps and ideas can be lowered. It is used to get inspiration, find pros and cons of each application to enhance the chances to create better ideas. No equivalent application to Sortapp exists, but it shows that each sub function, defined by Sortapp, is represented in different applications. None of the apps that have been found on the market, have had the desirable functions combined in one (The Balance, 2019) (Mattsson, 2017, 18 August) (Mobil, 2018).

Sortly is an application made to organize at home, a home inventory app. Pictures are taken on the items and put in different folders and sub- folders (5 levels). Each item can be tagged with name, price, notes etc. Other features are barcode- and QR-scanning, accessing the inventory online on websites, pdf, drop box and evernote. According to Sortly it is easy and intuitive, used to manage items at home as well is in smaller offices and to help organize a move (Apple, 2019).

Quick Peek is also an app, similar to Sortly; organizing the home inventory but with the help of so called "smart labels". The labels are self- adhesive, similar to QR- codes that each person orders or prints out and places on the boxes. To sort the items, a photo is taken of the item and gets scanned to the barcode on the box before putting the item inside. To find out what items each box contains, a scan function can be used where the items attached to the barcode are thereafter visible on the smartphone screen. Another function is a simple search feature, where the user searches for an item by typing the items name. The app uses iCloud and Dropbox for backup (Apple, 2019).

Shpock is an application used for buying and selling items, having easy access to the items 24/7, with 10 million users. The application has won an award from Apple in sustainability in 2017. To upload an item to sell; take one or more pictures on the item, write some notes, choose a category, set a price, then upload the item and the task is completed. It is a great app for sharing and selling items (Apple, 2019).

The last service studied is Hygglo, an application used to rent each other's unused items, in a safe and secure way by using BankID for identification. Hygglo also offers a drull insurance including a no limit cost for the items during the rent. The app is excellent to rent out unused items to people who are in need of them, so that they do not have to buy new things, which is a positive sustainable aspect (Apple, 2019).

03.

PHASE 1

Exploring the application

The first phase presented below describes the initial user tests made on the first version of the application (v.1.0), the applied methods and the results. Different user tests have been conducted to gain reliability in the tests and results.

3.1 Phase 1: Exploring Sortapp v.1.0

This chapter presents the methods used during the project to identify issues with the existing application v.1.0, by completing various prototype tests. A survey on how people's storages are organized and managed is conducted to understand the users' needs. The methods are presented in the same sequence they have been completed.

3.1.1 Guided onboarding on application v.1.0

A guided onboarding to the application (v1.0), was created by Sortapp to be used as an introduction for new users and guide them through the app. The material to conduct a guided onboarding was received during the first meeting with Sortapp. No tests or any use of the app had been completed in the project prior to this. The guided onboarding was conducted on a computer to let the first two users (26 and 28 years) assess the prototyped pages of understanding the app with no additional information besides the prototyped pages. The test was conducted by the test subjects separately, studying and analyzing each page, showed in figure 7 below. Notes documenting the parts that were unclear/confusing and elements that were intuitive, seen from a UX point of view as well as a UI perspective, was conducted during the assessment. The initial test was used as a first understanding of how the applications first appearance was perceived.

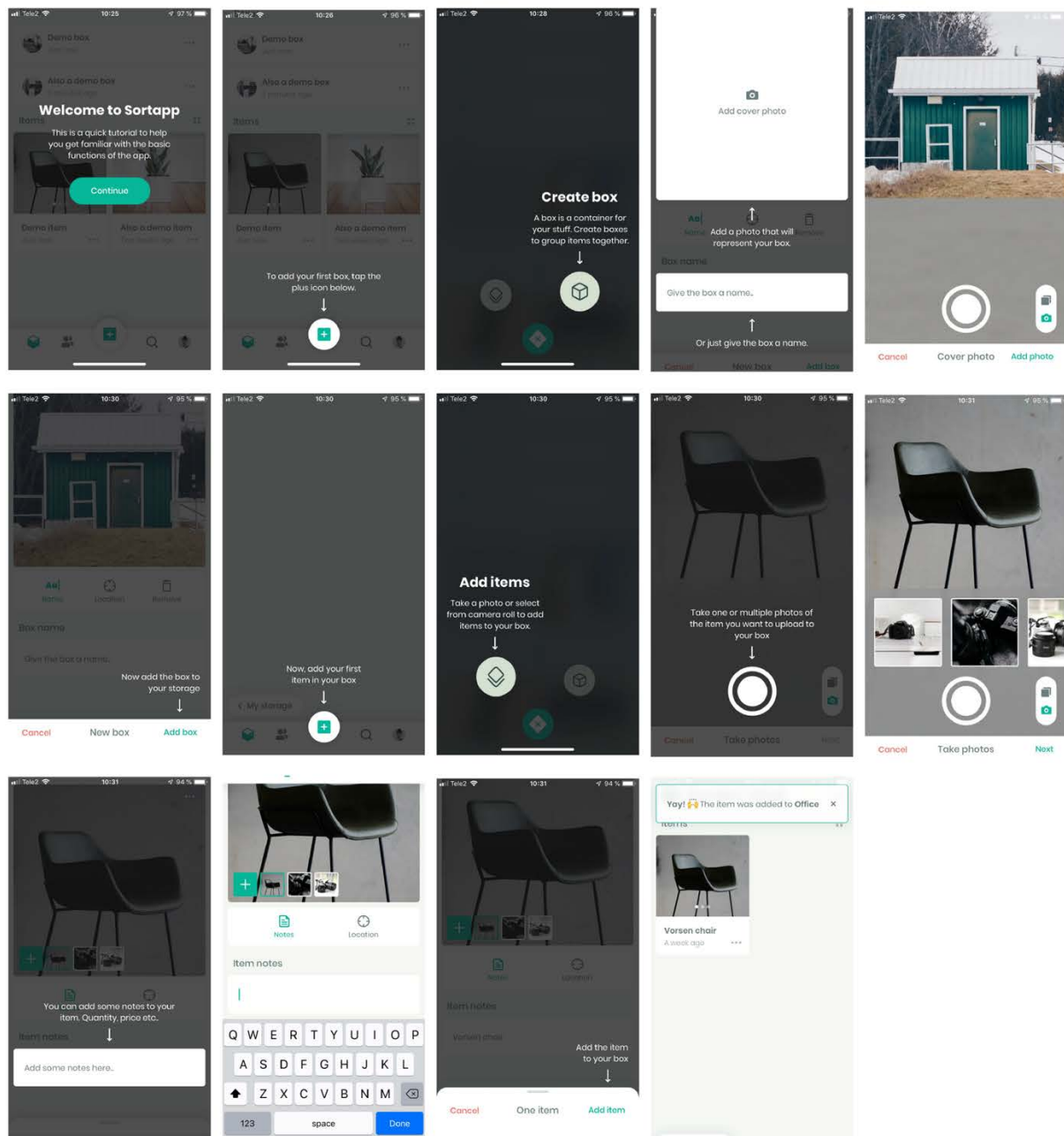


Figure 7. The 14 prototypes of the onboarding process (created by sortapp).

3.1.2 User test on application v.1.0

Several user tests were completed with the app (v1.0) to receive as much feedback from new users as possible. Firstly, the application was thoroughly examined and interacted with on an iPhone, by the first two users (26 and 28 years) to give initial insights, gaining more knowledge on use and features that are included in Sortapp (v.1.0). Analyzing the app would aid the project to conduct further user tests regarding the organizing and storing elements.

Secondly, additional user tests were completed on an iPhone with four people of various ages (11-81 years), genders, educations, professions and interest in using applications. This user test was based on the given tasks to download the app, create an account, create a box, add three items to the box and lastly share their storage with another Sortapp user. No help or guide through the process was given to the subjects. These user tests were documented by filming the subjects while they try to accomplish the given task of; installing the app, registering an account, creating a box, adding three items to the box and sharing a storage with a Sortapp member. The documentation method was chosen as it offers a way of re-looking at the interactions and analyze the discussion generated during the sessions. This was a pilot test conducted on a broad variation of users to gain more insights on how to conduct further user tests.

3.1.3 Application test within groups

As a second part of the exploration phase, the app (v1.0) was introduced to two different groups. These group tests were held to obtain an overview of how the app was received and handled by potential users. The groups consist of design students from Chalmers (20-35 years). The first group included three subjects and the second group included two subjects. The two sessions were 20 minutes each. The tasks given to the groups were to download the app on an iPhone, create an account, create a box, add three items to the box and lastly share their storage with another member. The subjects were asked to complete these tasks individually, while completing the tasks the subjects were asked to write down their thoughts and any obstacles they encountered along the way. To conclude the tasks given to the subjects, a short discussion was held at the end of the session.

3.1.4 Survey on sorting habits

To identify user needs regarding potential users sorting and organizing habits, a survey was formed. The survey was not directly aimed to a specific user and therefore the questions were general on how various people store their occasionally used or unused items. The first gathering of user data was to obtain an overview of potential users and their storage situations. To gather the information, a survey of 13 questions was designed. The answers that were required differed from being single and multiple choice as well as a few written answers, showed in appendix two. The composition of this type of questions was to form a survey that would not be too demanding or time consuming.

The first questions of the survey were open, the following questions relate more to experienced feelings and struggles. The survey was distributed on various groups on Facebook to be able to reach a broad group of potential users.

When analyzing the gathered data from the survey a separation of the quantitative and qualitative data was gathered. The quantitative data was used to identify potential users and their situations and habits regarding storage. The analyzed data was used to recognize existing problems and obstacles to further identify user needs. To explore the analyzed data the KJ-analysis method was used. By grouping different comments and written answers obtained by the survey, the difference in the identified needs could be established (Johanesson, Persson, Pettersson, 2013). Thereafter the result of the analysis would further help translate identified needs into features in the app.

3.1.5 User test: Invite a friend

For an enhanced understanding of how users interact with the app (v1.0) a quick and short user test was conducted on eight students at Chalmers (20-35 years). The subjects were to test a prototype of the Sortapps (v.1.0) sharing a storage feature on an iPhone. Their mission was to share their storage "Sommarstugan" with a virtual person in the app called Ann Stahre. There was no given time limit, the subjects were only asked to try to achieve this task whilst being filmed. The chosen documentation approach of the test sessions was to be able to better analyze each test subject's interaction by re-looking at images and re-hearing discussions during the sessions. The prototype tested was simple and consisted only of a few interactive features in regard to the task of sharing a storage, the prototype is shown in figure 8 below. The test was conducted for Sortapp to use as a basis for their improvements of the basic sharing a storage feature.

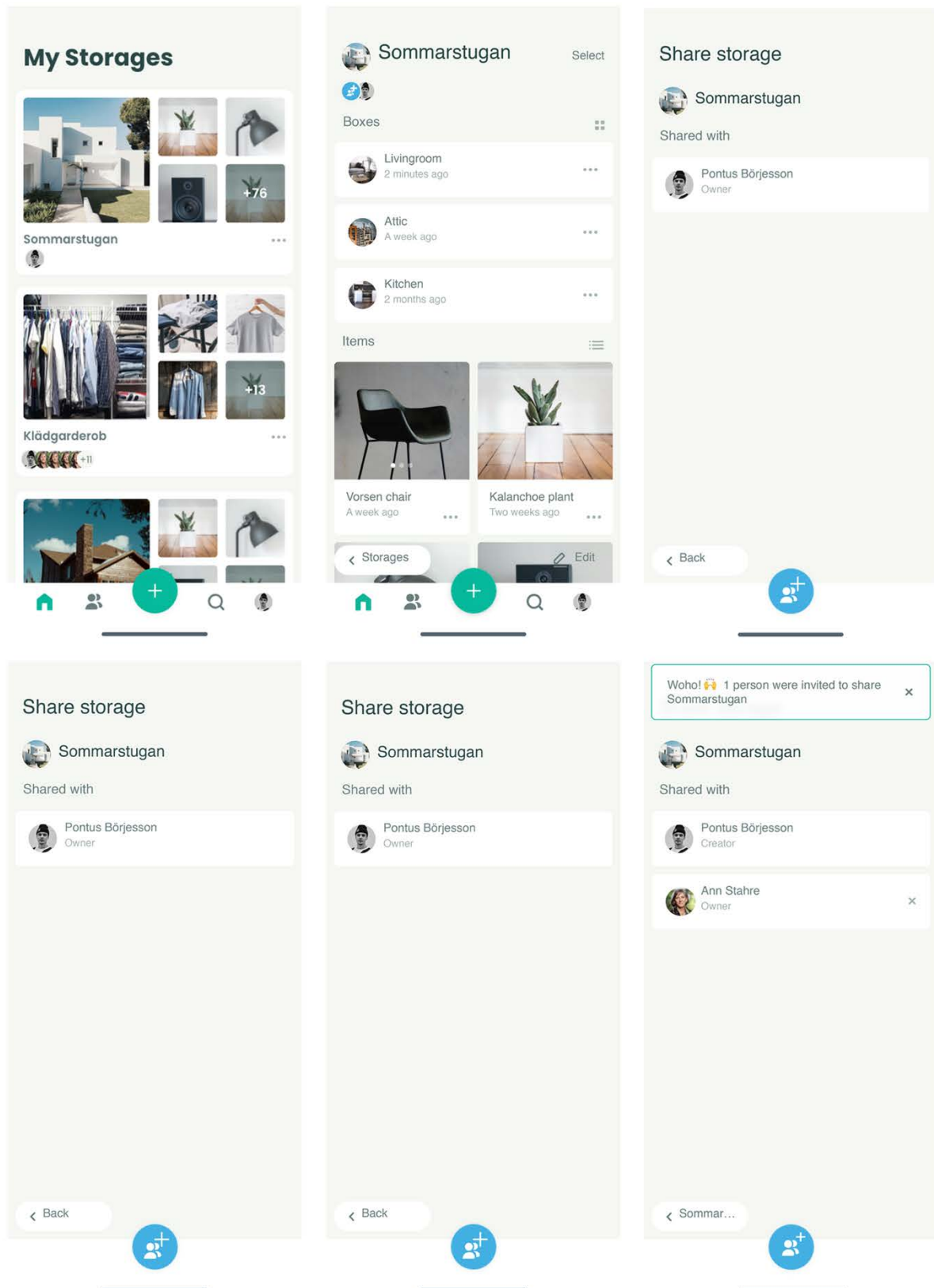


Figure 8. The prototype used to test the sharing a storage feature (created by Sortapp).

3.1.6 Priority list

Creating a priority list with the most important issues regarding the features tested during the various user tests, presented above in chapter 3.1.1 -3.1.5 was a method of evaluation. The most important issues represent the frequently recurring obstacles the subjects encountered while testing the app (v.1.0). This list was created to gain a collected view of both the user tests and the group discussions, to present in a meeting that was set with the developers of Sortapp. The meeting was set to present the results but also to discuss and add information to Sortapp about the results found during the user test on the application.

3.2 Results Phase 1: Exploring Sortapp v.1.0

This chapter presents the results of the methods used during phase 1 of the project. The phase was completed to identify issues and enhance the knowledge of the existing application. The results below are presented in the same sequence as the methods in chapter 3.1.

3.2.1 Analysis of the guided onboarding

Testing the guided onboarding was conducted for the first users to assess the prototypes in a matter of understanding the app with no other information except for the prototyped pages. The result of testing the onboarding showed some difficulties in understanding a few pages. There is a need of adding some pages and removing others etc. to simplify for the users, shown in appendix I. The results showed the importance of highlighting buttons and symbols to inform the users where and when to interact with different features. Another part is to show the steps that are not recognizable from other applications, new features need to be explained. An important part discovered during the test was to show/explain what actually happens when entering a new frame/interface, the importance of notifications, as well as the importance of being consistent visually, as in symbols and text descriptions.

3.2.2 Analysis of user tests on Sortapp v.1.0

The result of the first pilot test gave information on bugs that was given to Sortapp to be solved directly. Other findings from the user tests on Sortapp v.1.0 gave additional important information on how to change the user experience by enhancing and changing some symbols, moving and removing buttons. The design of the app could be further improved to simplify the usage, by changing colors and sizes of icons/symbols and windows, all showed in appendix III.

The videos from the second user test were analyzed and the findings regarding the user experience, design and functions were collected in a document showed in appendix III. The users found it difficult to understand how to add several items at the time, problem showed in figure 9, and to take notes on each item seemed impossible for all participants. The location icon was also unclear for the participants when they wanted to move items between boxes, showed in figure 10.

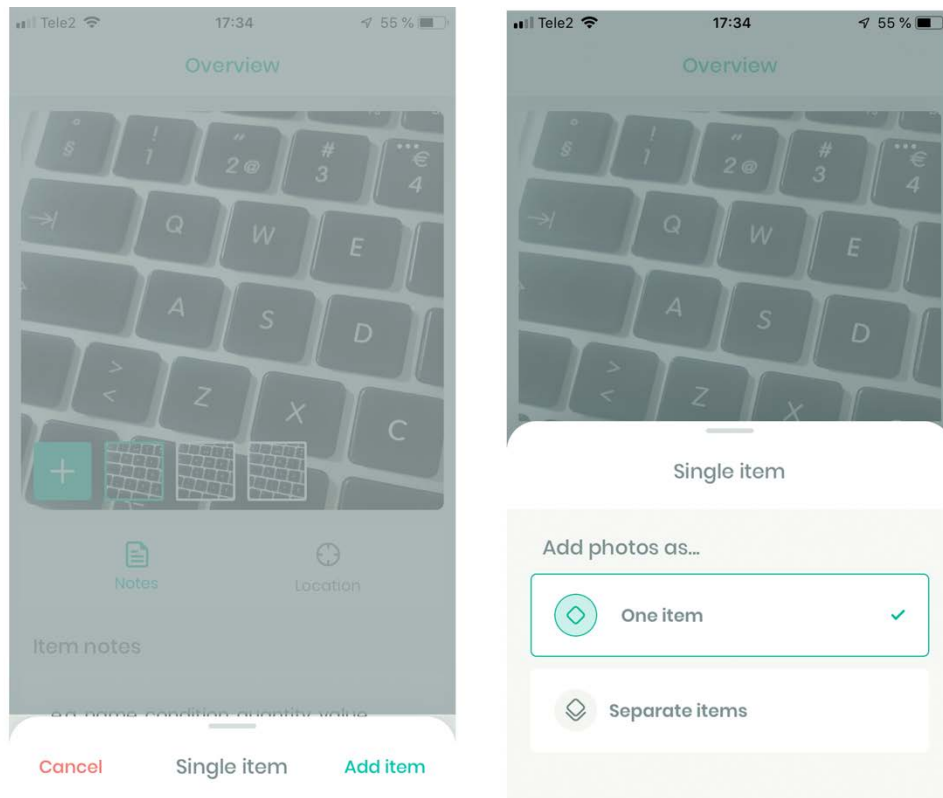


Figure 9. Illustration of the Several item bar (created by Sortapp).

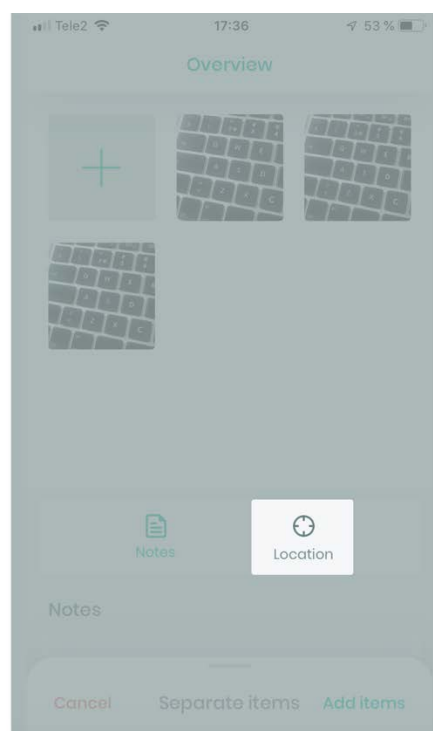


Figure 10. Illustration Location icon (created by Sortapp).

In the first stage the most important part was to find and fix bugs, improving the app to work fluently. Another important finding was that people recognized some symbols from other applications and assumed they worked similarly, which must be considered

for further development. The result gave quick input that was further presented to Sortapp so they could improve and develop these issues immediately to facilitate the interaction for new users.

3.2.3 Analysis of tests in groups, Sortapp v.1.0

The group discussions conducted on the app, version 1.0, resulted in a list of many questions and obstacles discovered by the subjects. Nearly all the difficulties mentioned were experienced by all subjects. The most difficult part of the task was to share a storage with another member of the app. The users did not find the sharing feature or found another way to share the storage. However, this optional sharing feature appeared not to work when checking if the user had been added to the storage. Another difficulty the subjects had encountered were distinguishing some icons and symbols. The location icon, showed in figure 9, was thought to lead to a map rather than showing where in a virtual storage an item was located.

The results were grouped in different categories and functions to better understand where the most difficulties were encountered. The main categories defined were; installation, create a box, item, share, my storage and others. These categories are also related to the tasks given. In appendix IV a compilation of the six categories analyzed is presented.

3.2.4 Sorting behavior

The statistics of the survey answers were widely spread, and the number of participants was counted to 864. The outcome of the first survey gave insights on what worked today and what was lacking in regard to people's storage habits, see appendix V. Many answered that a digitized storage sounded like a good idea but in practice would mean a lot of work, such as documenting and continuously updating the documentation. These obstacles and issues were already identified in the first user test of Sortapp version 1.0. The recurring difficulty and concern are the process of taking photos of one's items and placing them in digitized storages in Sortapp. Which seemed to not be a good enough reason for people to use the app. The process of sorting and organizing one's storages is not rewarding enough. The time it may take to re-organize and digitize an entire storage, or even simply a few items seems to be too demanding in the present for people to see the future benefit of the app. A few recognized these benefits as in being able to reduce one's consumption, having a better overview of what one owns in case of theft or accidents, being able to sell second hand and so forth.

Results of how people store items at home

There are several ways of storing items and belongings, shown in figure 11, according to the survey. A common solution is through storages. These storages can vary in size, location and condition. Below a list of common storage spaces is presented:

- Attics
- Cellars
- Wardrobes
- Pantrys
- Garages
- Rental storages
- Family storages

The below list represents different ways of sorting and organizing items inside a storage:

- Open shelves or wardrobes consisting of drawers/boxes and hanging systems.
- Boxes; clear boxes in plastic, brown boxes or colored ones with name tags etc. to organize.
- Bags of various sizes and materials.
- Creating piles of items.

Additional solutions to organizing storages can be following:

- A written list, by hand, excel file, or on the phone etc.
- Pictures of the items stored, saved in a computer or smartphone



Figure 11. Illustration of furniture used for sorting.

3.2.5 Analysis of prototype test

By thoroughly analyzing each subject's interaction with the prototype on inviting a friend to a storage, several obstacles could be identified. Two main problems that were expected, due to the simplicity of the design occurred. Firstly, the black and white format made it more difficult for the participants to identify interactive elements. The second format issue was that the prototype was designed to fit an iPhone X screen and an iPhone 7 was used during the tests as it was what the project possessed to test on. The entire interface of each section was therefore not displayed on the screen of the iPhone 7, which led to the test subjects needing to remember to scroll down to the bottom of the screen each time they would enter a new page/interface of the app.

All test subjects had difficulties in finding the feature "inviting a friend" in the section "Sommarstugan". Many would try to enter other sections and icons to find a way of performing the task of adding Ann Stahre to "Sommarstugan". When the test subjects had found the feature that was intended for them to use to complete the task, the following steps to reach the goal showed no added difficulties or obstacles. The result from this user test was very insightful and culminated in suggestions on what to redesign to obtain a more intuitive interaction.

Three simple ideas were designed to facilitate the task of "inviting a friend" to a storage. The first resulted in moving the icon "adding a friend" in the prototype to the right side of the screen as many of the test subjects searched for an interactive element to the right, shown in figure 12.

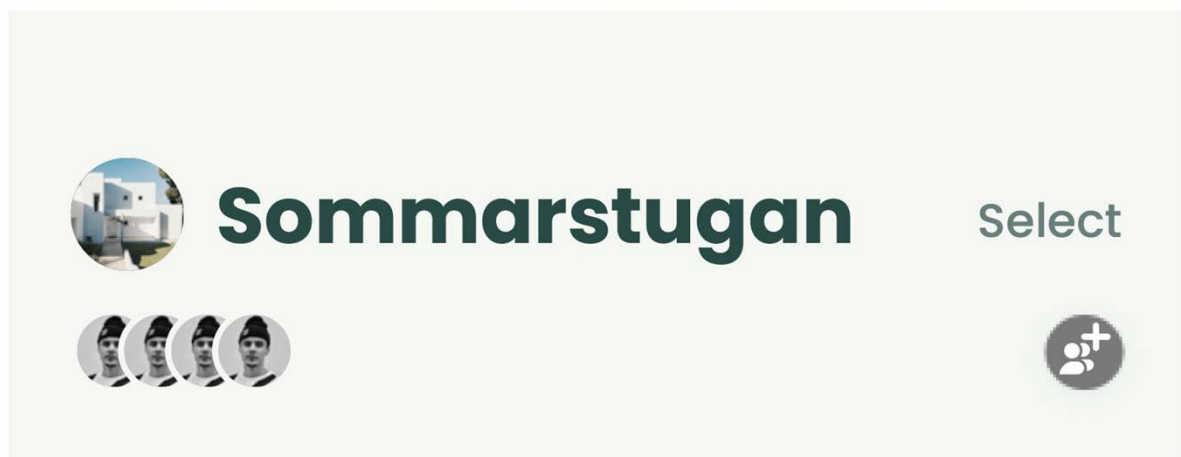


Figure 12. Illustration of "adding a friend" icon placed to the right.

The second idea for "adding a friend" is also in regard to the icon and its placement. In this design the icon is enlarged and placed to the right of the title "Sommarstugan". This idea is thought to help users identify the symbol directly when in the storage "Sommarstugan", see figure 13.

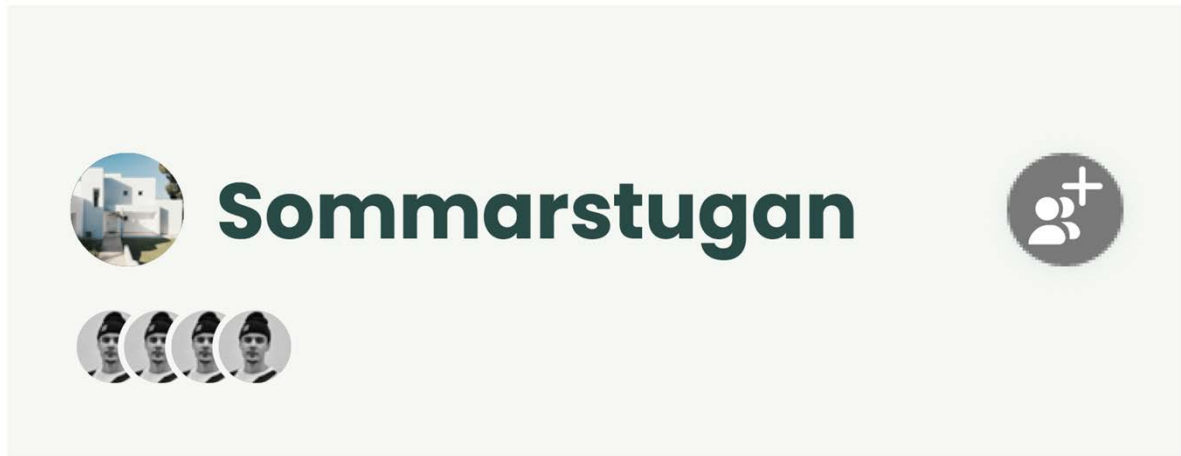


Figure 13. Illustration of "adding a friend" symbol enlarged and placed to the right.

A third and different approach was explored for this feature, to design without the symbol from the prototype. This resulted in removing the symbol of "adding a friend" and adding the feature to another feature, the menu icon. It was seen during the test that many subjects when unsure of what they were looking for, as an unknown icon, they would often go to the menu icon to hopefully find the feature there. The menu is represented in a three dotted icon and is placed to the right of the title "Sommarstugan" to be easily found, see figure 14.

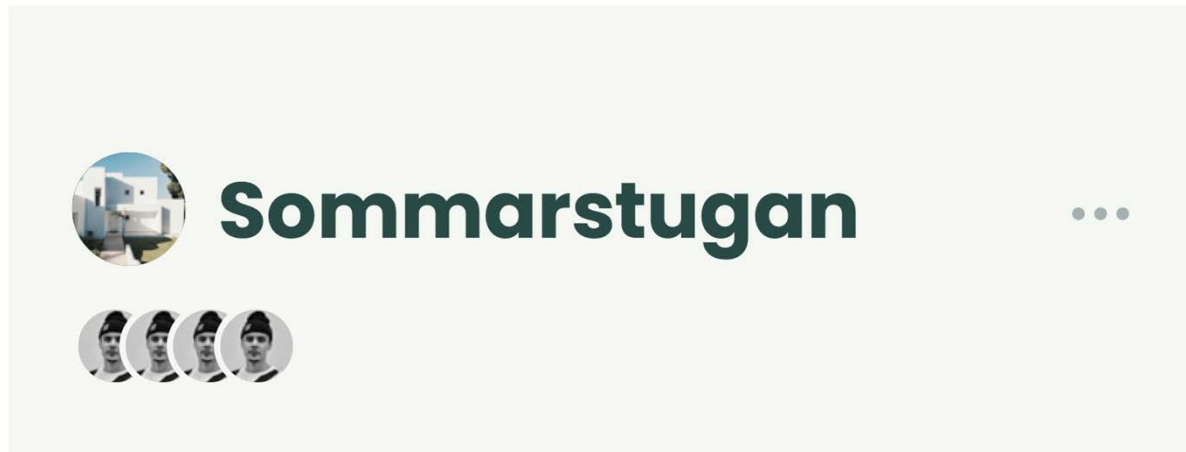


Figure 14. Illustration of a menu icon placed to the right of title "Sommarstugan".

Other ideas were designed as complements to the app and features explored and discussed during the prototype testing. A recurring difficulty that many test subjects encountered when first introduced to the app was understanding that the main page is an overview of the user's storages. Many had trouble understanding that adding several storages is a possible function. Therefore, an idea to change the big (+)-symbol in the footer to a symbol that helps to enhance the perception of the main page being a storage overview, see figure 15.

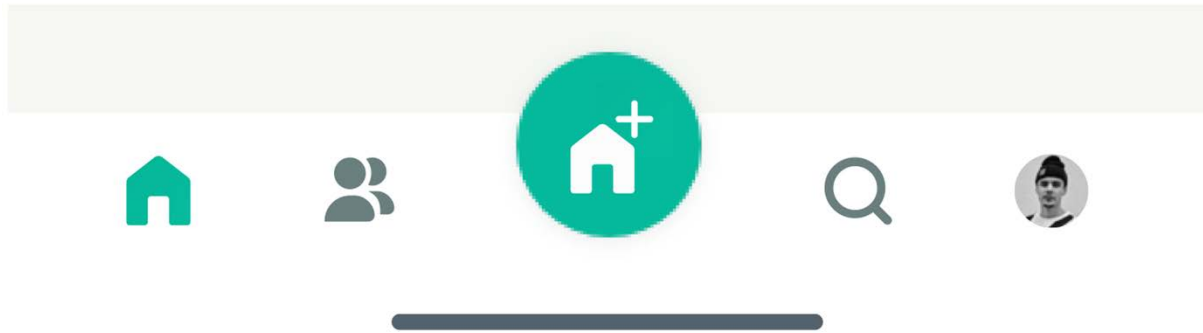


Figure 15. Illustration of symbol "adding storage" when in storage overview scene.

Another difficulty the test subjects have expressed during tests throughout the project, is the sharing feature. Many think of it as a contact list, as the icon represents two people which is often referred to some sort of contact list in other apps and digital services. Two different ideas of icons symbolizing sharing are seen in figure 16 and figure 17.

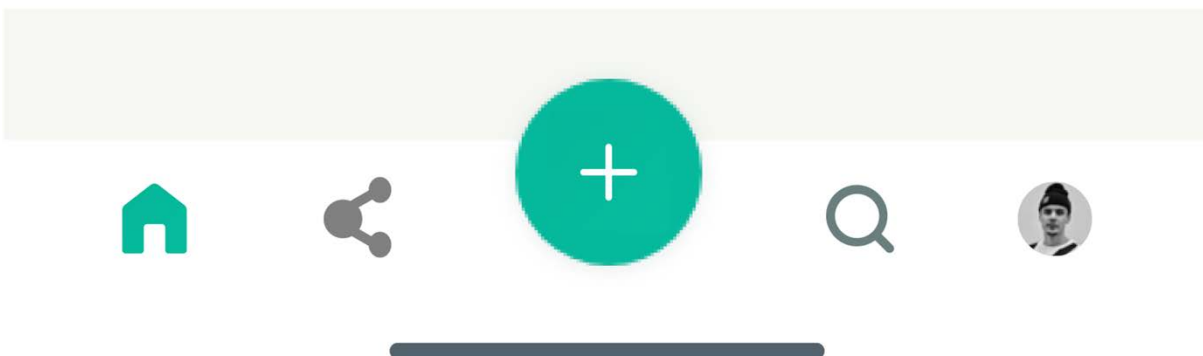


Figure 16. Illustration of sharing icon idea 1.

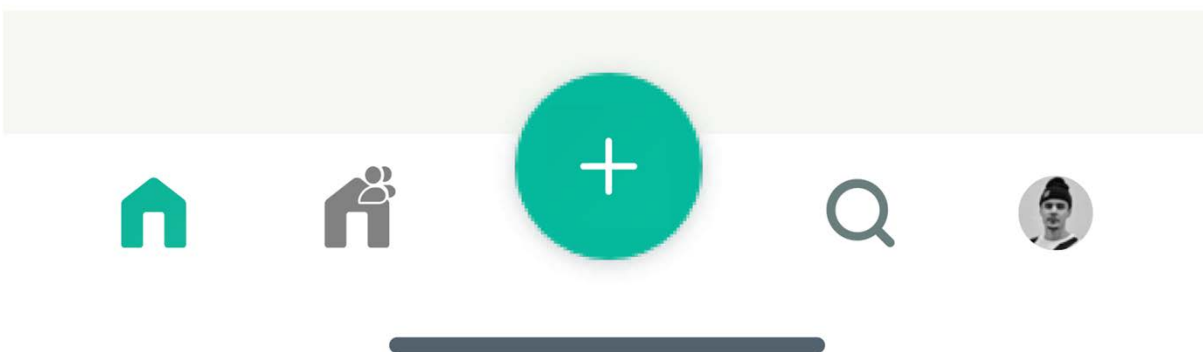


Figure 17. Illustration of sharing icon idea 2.

The ideas presented above were all given to Sortapp for them to evaluate. Designing new icons and changing the layout of the prototype was rewarding and further knowledge on prototyping was gained.

3.2.5 Conclusion Phase 1- prioritizing problems

To obtain a sorted result of the tests and meetings, a priority list was set according to the most common problem shown by the user studies of the application version 1.0. Categorizing all occurring problems shown in the tests and then prioritizing each problem accordingly as below:

1. **Main menu-** The most important feature is to clarify for users that one can create multiple storages. An improved overview and functions need to be clarified to enhance intuitivism.
2. **Feedback-** Receiving notifications when completing tasks actively: sharing e.g. when one has shared a box with others. A need of a confirmation that sharing has been completed but also when deleting, editing items etc. was identified.
3. **Single/Separate item-** Unclear function that is easily missed as it is placed in the tab bar footer.
4. **Symbol/features-** Symbols need to be clarified.
5. **Be consistent-** Keeping text, colors and symbols consistent, to create an easier interaction.

Some minor defaults were noted and not prioritized as they are easily changed according to the developers, all shown in appendix VI. The list was handed to Sortapp to help them prioritize functions for further their development of Sortapp version 1.0. The issues presented in the list are problems on the main functions and features of the application. The priority list helped gain an understanding of the importance of the interaction and how it can be developed by changing minor parts such as symbols, which is important knowledge when working with further developments for the application.

04.

PHASE 2

Analyzing the sharing process

One of Sortapps visions is to combine the organizing function with a share and sell function and implement these features in the existing version of the app (v.1.0). The share and sell functions and features have not yet been developed. The chapter below presents the second phase of the project, a study on the sharing process and what needs can be identified.

4.1 Phase 2: Sharing behavior

This first section presents the methods used during the projects second phase to identify the user needs in order to develop the app further and explore the possibility of a sharing feature. The methods are presented in the same sequence they have been completed. Phase two has been worked on in parallel with phase one.

4.1.1 Potential users

To be able to explore and understand the way people share items with each other a hypothetical target group was determined. The target group represents a specific customer that expressed obstacles and problems in a certain area and whom could be potential users. To connect to Sortapp's aim of supporting a sustainable future by decreasing consumption, a target group based on the same approach was established by Sortapp. The target group was to be used as a guide to gather data on their behavior towards sharing, and to find a relevant questioning plan to explore feelings and experiences. A target group of meticulous organized users was not chosen; thus, it was shown that they already have an organization plan of them. This was the outcome of the first survey in chapter 3.1.4, seeing that organizing was not identified as a valued need.

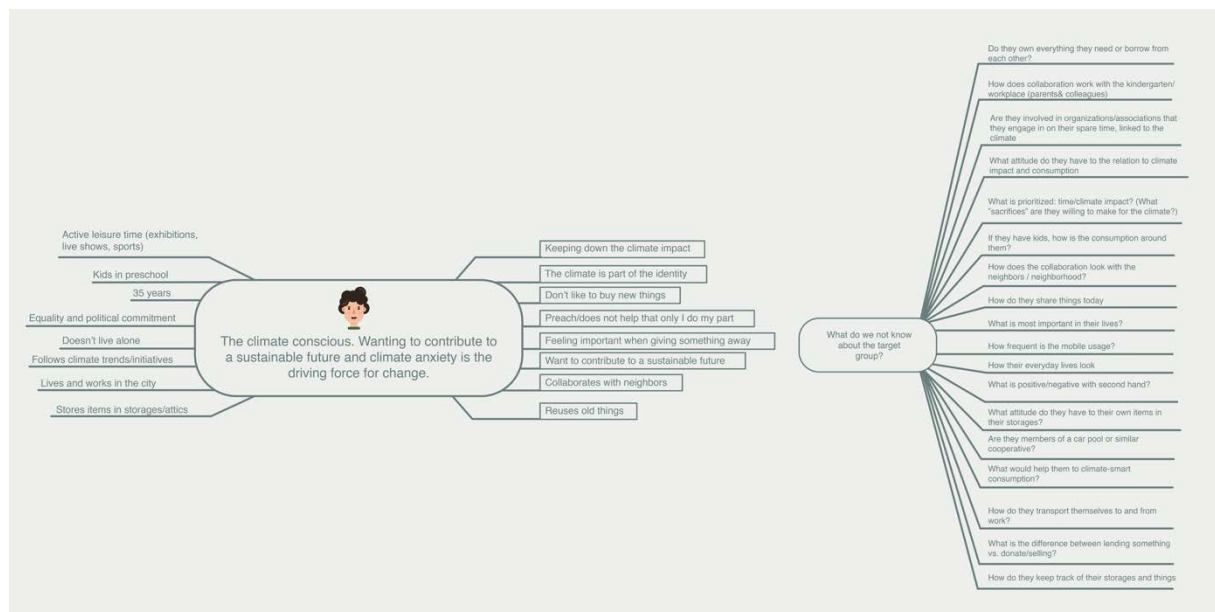


Figure 18. Illustration of the target group according to Sortapp.

As additional support and guide on whom to study and design for, a persona was created. The persona consists of a more detailed description of a targeted user. This includes habits and attitudes towards sharing. The persona would further work as a tool to generate ideas and concepts. To find a relevant and potential user a mind map was created by Sortapp on a hypothetical user, see figure 18 above. This hypothetical

user and persona are connected to Sortapps aim of being sustainable and contribute to a decrease in consumption.

By identifying a smaller target group and a persona in a certain segment, it facilitated for the first marketing and the first customers to get their hands on the product. This will later on improve the service/product to reach a larger target group. The existing application is based on a sorting feature with the idea of informing the user about all things they store. Also offering the users the possibility to invite other Sortapp users to see what they have stored and organized through Sortapp and thereby be able to create a shared storage.

4.1.2 Survey on Circular consumption

A second survey was designed after the positive result and useful statistics from the first survey completed in phase one. The second survey was created to gain knowledge on how people share, sell and consume items today, shown in appendix VII. Also, to gain knowledge in people's interest and concerns about the environment. In comparison to the first survey, completed in phase one, this second survey was distributed to a specified target group, that was established by Sortapp as mentioned in the previous section. The survey was therefore distributed to Facebook groups matching the target groups interests to reach the right type of audience. However, this led to fewer people completing the survey and therefore a lesser amount of data to analyze.

The survey was structured as a funnel; starting out with questions about the person and their interest in climate change and sustainability issues to find out if they were included in the defined target group. Thereafter the following questions were aimed towards how people consume and share today. In total there were 16 questions, with a variation between single and multiple-choice questions and two written answers. This layout was formed to create a short and not too demanding survey that would not take up too much of the participants time.

The analysis of the survey was completed with the KJ- analysis method, a method used for analyzing quantitative data (Johanesson, Persson, Pettersson, 2013). By grouping different comments and written answers obtained by the survey, the differences in the identified needs were able to be established. The comments were documented and analyzed to find patterns in how people actually share items with each other, which was information that was useful to improve the app and the process of sharing products through Sortapp.

4.1.3 Sharing scenarios within Sortapp

The app (v.1.0), is developed to help users organize their belongings by taking photographs, adding notes and placing items in virtual boxes and storages. A second

important function and feature is being able to share belongings with family, friends, neighbors and others. This feature is integrated in the app as “sharing storages”, meaning items and boxes cannot be shared separately only through a shared storage. To share a storage, a user needs to invite a friend to their storage. A feature that is found in the storage interface and is in development.

To define and ideate around the possible ways of sharing belongings through Sortapp, scenarios were created and analyzed. When creating scenarios, a definition of the different levels of users could be established. As this was early on in the development of Sortapp and the focus was on perfecting the MVP, Minimum Viable Product, the definition of users was simplified (Interaction design Foundation, n.d). When creating scenarios, it was possible to study the potential risks that users may encounter during the usage;

- Who can delete items in a shared storage?
- Who can delete the storage?
- Who decides whom to invite to the storage?
- Who decides on what to lend out in the storage?

The questions above were important to acknowledge when creating scenarios and different levels of owning/controlling, which was important to establish to minimize the risk of accessing functions that led to unwanted results.

4.1.4 Journey mapping

The journey map is a new method used primarily for studying user’s consumption cycle, mapping each step using different symbols and definitions for each activity. The method was used to analyze the results from the user study, mainly from the survey - Circular consumption, shown in appendix VII. It was used to gain knowledge on parts of the journey that were vague or unclear and if further user studies on sharing was needed.

The mapping was completed in collaboration with the creators of the tool, Anneli Selvefors and Oskar Rexfelt (USE2USE, 2019), during a session/lecture in how it can be used. Each hexagon is a presentation of the users’ different activities, shown in figure 19, and together they create a product journey presenting a process of product use. The activities were built into a “cluster”, describing certain parts of a journey, these clusters were connected to each other with a rectangular “phase exchange” describing an exchange activity, shown in figure 20. The small white triangles show comments of thoughts and certain actions that can be connected to an activity, shown in figure 21. The large circles show decisions within the activities shown in figure 21. The circle with iteration arrows shows activities that require a repetition between activities, also shown in figure 21. The gray lines/channels “request” and “show item” are added to show the important communication activities between the users (U1 and

U2), shown in figure 22. The dashed line in the middle separates the entire journey of the product, clarifying the two users' different activities. The activities placed above the dashed line represent U1 activities and below the line the activities of U2. Lastly, the smileys represent various feelings regarding the different activities, shown in figure 23. The happy smiley represents a positive feeling, a good experience, while the sad smiley represents a negative feeling, a bad experience which can also be described and referred to as a pain. The pains clearly show which parts of the journey map that need to be prioritized and which activities need to be analyzed and altered to increase positivity in the journey for both users.



Figure 19. Illustration of the different activities used when describing a product journey.

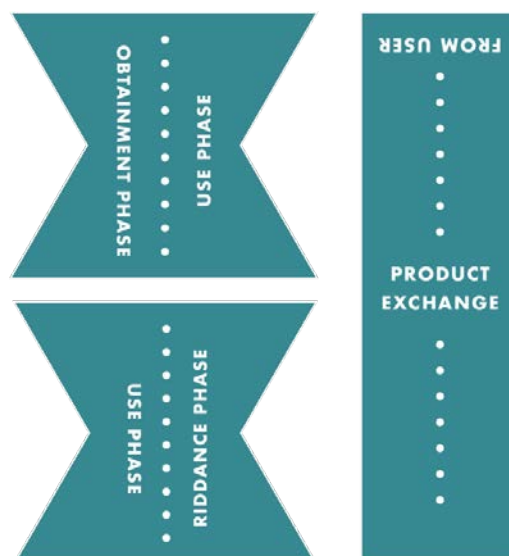


Figure 20. Illustration of the different phases and exchanges in the journey map.

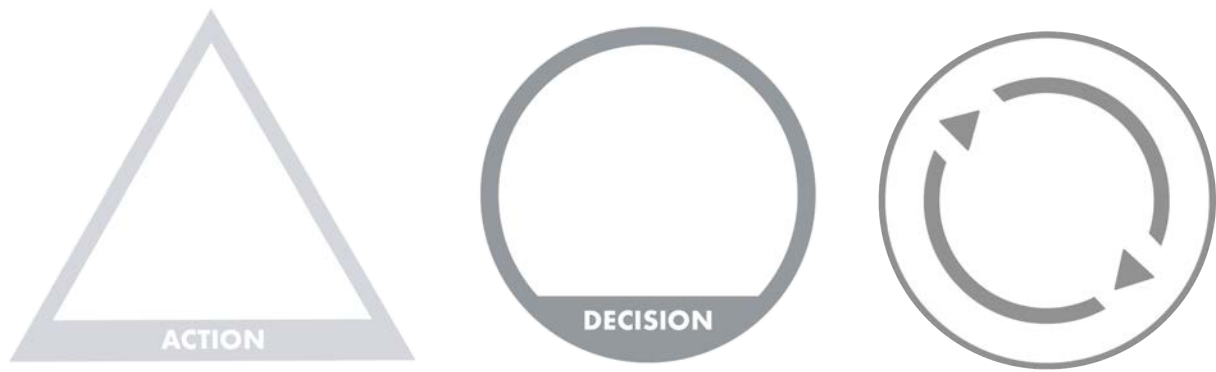


Figure 21. Illustration of action, decision and iteration factors.



Figure 22. Illustration of icons representing positive and negative feelings

Figure 23. Illustration of representing communication exchanges.

During discussions a chosen journey was determined, based on the survey question about lending a ski jacket to a neighbor. Firstly, a structure was chosen about which parts of the jackets journey should be shown, which were separated in six parts with two users; User 1 (U1) that lends the jacket and User 2 (U2) that borrows the jacket. The two users were defined as neighbors. This was due to the results from the survey on circular consumption, where participants mostly answered that they prefer sharing with family and friends. However, it was seen that sharing with a neighbor was also desirable and therefore led to believe that it was a good example to explore further. The six parts of the sharing process established to explore were:

1. Using of the jacket for U1.
2. Packaging and lending of the jacket for U1.
3. Searching, asking around, looking, borrowing the jacket for U2.
4. U2 using the jacket.
5. U2 storages and taking care and returning the jacket.
6. U1 getting the jacket back, controlling the jacket if it is in good condition.

The first journey map was made for the jackets journey without using Sortapp, how to find an item one is searching for, checking different ways to get an item and where and how to get it. Also, the thoughts and problems the lender encounters, evaluating and storing the item, lending the item, communicating conditions and rules. The second journey map shows how the journey could be presented using the application, Sortapp. This generated the possibility to identify what Sortapp can improve and what still needs further exploration to facilitate the process and the journey of an item from one user to another.

4.2 Results Phase 2: Analyzed sharing behavior

This second section of phase two represents the results from the previously described methods. The results relate to whether the established target group by Sortapp can be potential users, if circular consumption is a practiced approach and if sharing and selling second hand is an alternative way of consuming products. These outcomes validate the purpose of creating a sharing feature to add to Sortapp.

4.2.1 The hypothetical user

The hypothetical target group, found in chapter 4.1.1, chosen by Sortapp to match their sustainability vision, was set to a man or a woman 25-40 years old, with kids. The hypothetical target group reflects people that are environmentally conscious and find solutions to reduce their negative impact on the environment by changing their daily habits. They are aware of circular economy and that overconsumption is a crucial issue that needs to be addressed. They understand the importance of the re-use of products and resources rather than throwing away and adding to the great waste hills. Buying and selling second hand is their first choice of consumption as well as sharing within their neighborhood and community.

Persona



Emilia is a 33-year-old woman expecting her second child. She is currently living with her 2-year-old boy Frank and 32-year-old partner Emil. They live in a ground floor apartment with a terrace in the district Majorna in Gothenburg. She works as a Chemical engineer at ASTRA in Mölndal, and commutes to and from work by bike or public transport. She has a great interest in sustainability issues both at work as an engineer and at home. She is a vegetarian and tries to choose eco-friendly produce when going grocery shopping for her and her family. Other

ways she tries to decrease her impact on the climate change is to recycle all waste, plastic, paper, food, glass etc. As a mother she sees that it is very important for her children to be aware of the impact human life has on the environment at an early age. She therefore tries to engage her son in daily activities regarding sustainability. She also sees the value in re-using instead of buying new products such as clothes or toys for her child. Emilia has siblings that also have children and together they try to share children's clothes to avoid buying new ones as much as possible.

Emilia values sharing one's belongings to reduce consumption and is a member of environmental groups and attends events in the neighborhood together with her partner Emil. Such events can be a garage sale where they sell their own stuff instead of throwing them away. Emilia and Emil have also started a community with families

and neighbors, where they meet up to exchange items they do not use. The community also has a group on Facebook where they can communicate what they have to lend or what they would like to borrow, to facilitate a sharing lifestyle. Ever since Frank was born, she really understands how much clothes a growing boy can go through just in two years. With another one on the way she finds it even more important to have the possibility of buying, sharing, exchanging or donating used clothes in their community. Especially when living in a family friendly community with many children in various ages.

4.2.2 How people share today

The survey aimed at the determined hypothetical target group, the environmentally conscious, resulted in 220 answers, shown appendix VIII. Although the outcome of surveys are seen as quantitative results, in this specific survey the results could be analyzed as both quantitative and qualitative. The results from the survey were informative and the answers regarding shared items were very similar. Many of the participants claimed that they preferred sharing with family and friends. Figure 24 illustrates whom the participants feel comfortable borrowing a ski jacket from and in figure 25 the participants were asked to whom they would feel comfortable lending their ski jacket to. A number of participants also answered that they felt comfortable lending their belongings to neighbors and acquaintances.

I can think of borrowing a ski jacket from ...

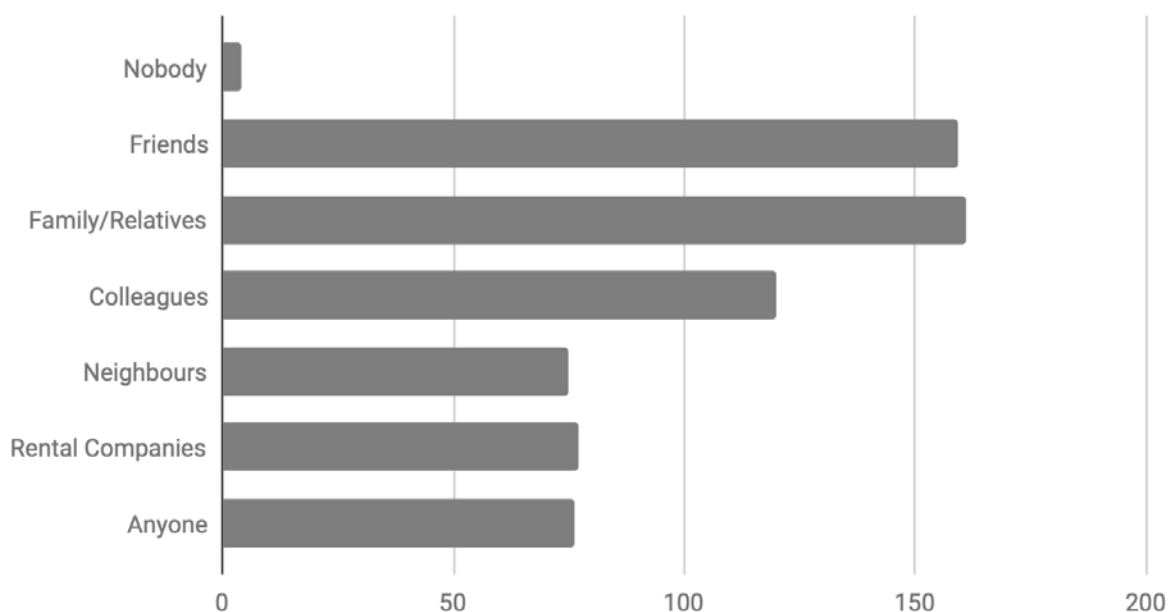


Figure 24. Survey chart regarding whom the participants feel comfortable borrowing a ski jacket from.

I can think of lending a ski jacket to ...

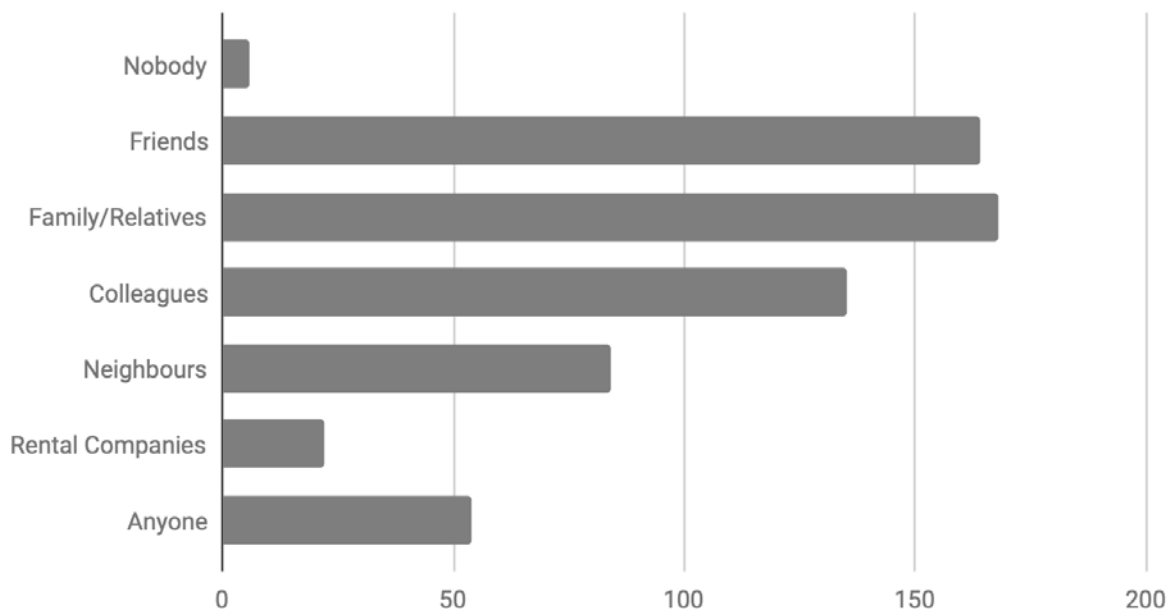


Figure 25. Survey poll regarding whom the participants feel comfortable lending a ski jacket to.

The overall threshold for the activity of sharing showed to be **asking the question** of borrowing an item. Many participants explained that they preferred lending their belongings to others firstly. That might be a direct cause of the effort needed to be made to find the right person with the right item to lend from. An additional feeling and experience the participants described, was feeling uncomfortable and awkward when having to ask to borrow something.

”Om någon frågar, såklart jag lånar ut om det går.”

- Anonymous survey participants.

A recurring topic that the participants expressed was the importance of trust. Trusting the other person that borrows an item to give it back, give it back on time and being careful when using the item. If the trust is not present, sharing is not an option. Also communicating the types of information regarding trust issues was described as troublesome. This trust issue can also be seen in how many preferred lending and borrowing with friends and family, as these are people, they most often have a built trust towards.

A few participants answered what type of platforms they used for sharing items. Facebook and their closed groups are a well-known and established way of sharing things with each other. Most participants answered that they usually communicated directly to a person without any agent, such as specific sharing platforms. Another important aspect to consider was that it was easier to lend/borrow from people

nearby. This was connected to the accessibility of the items, facilitating both the pick-up and the drop-off activity.

4.2.3 Sortapp members & sharing scenarios

When creating scenarios three users were defined as well as different levels of use connected to the users, see figure 26 below. After establishing these membership definitions, various scenarios were created exploring different interaction possibilities with a shared storage through Sortapp. The scenarios evolved around what features and functions the members have access to, in regard to their membership title.

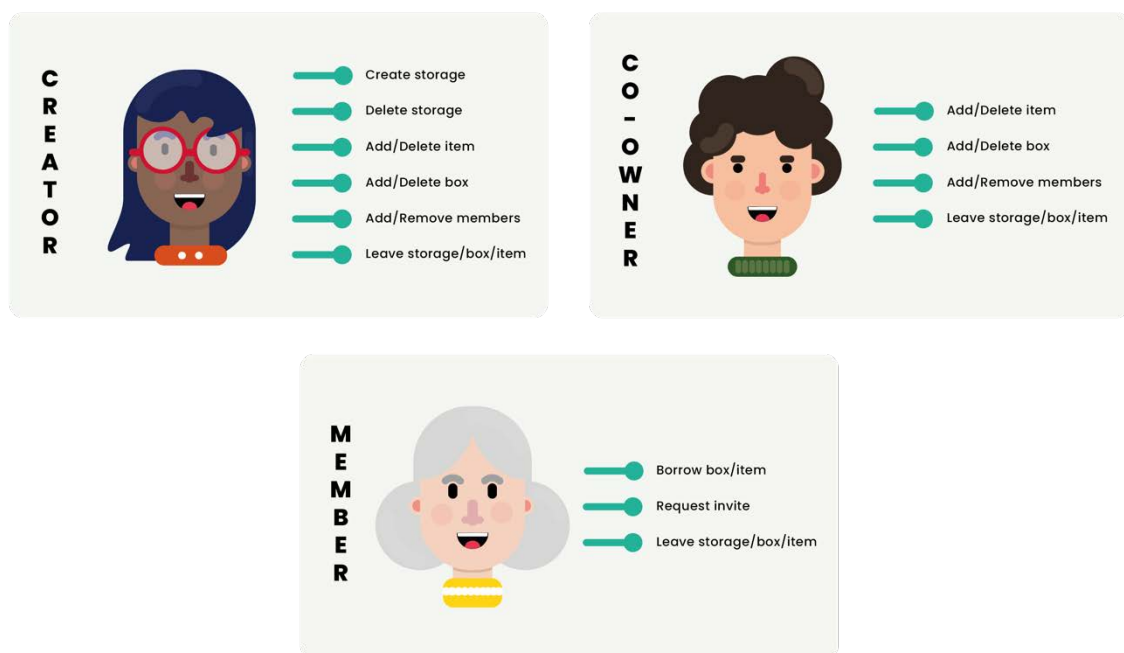


Figure 26. Illustration of three different user groups and their options of use.

The creator, shown in figure 26, has the highest responsibility of the created storage. All choices, for example; add items, questions on borrowing, adding members etc. are addressed to the creator of the storage. The creator can add a co-creator that has access to most of the features and functions a creator have. However, a co-creator cannot delete a storage, thus this action is strictly connected to the creator. The co-creator can also be upgraded to a creator if the original creator desires to leave the storage. This is to ensure that there always exists a user, responsible for the storage. A storage cannot be active without a creator owning the storage and managing the functions. The third level of responsibility was defined in a member, who has no particular responsibility of the storage. The member can be invited to storages, can leave a storage whenever and can access items in the storage.

All together eight scenarios were generated, see appendix IX. The scenarios helped gain an understanding of what a Sortapp user would like to accomplish and what these accomplishments entails for other users when sharing storages, boxes, items. The scenarios were presented to the Sortapp team working on the development of the app. This led to many discussions and ideations around terms and conditions. Additionally, it was important to inform the users of important changes and happenings. As the app supports users when organizing home inventory and sharing belongings, any changes such as removing or adding storages need to be communicated. Creating scenarios would further help guide the project in the ideation and concept phase. The scenarios work as a reference and a base for how users perform various task according to their needs when sharing.

4.2.4 Pains identified in a sharing process

The journey map method was a great way to analyze and communicate results from the user study regarding how people share and their attitudes toward the activity. The journey analyzed was the exchange of a ski jacket from one user, U1, to another, U2. The first map, illustrating the journey without Sortapp in figure 27, was used to describe and analyze how the journey of a ski jacket can be seen today. The second journey map represents the possibilities to change some activities from the first journey to show the process with Sortapp, see figure 28. The results in the second journey showed some improvements and fewer pains in the process for both users. It was therefore thought that the app can facilitate the lending process a great deal, which the difference in the two journey maps clearly presents visually.

JOURNEY MAP

How do people share items today?

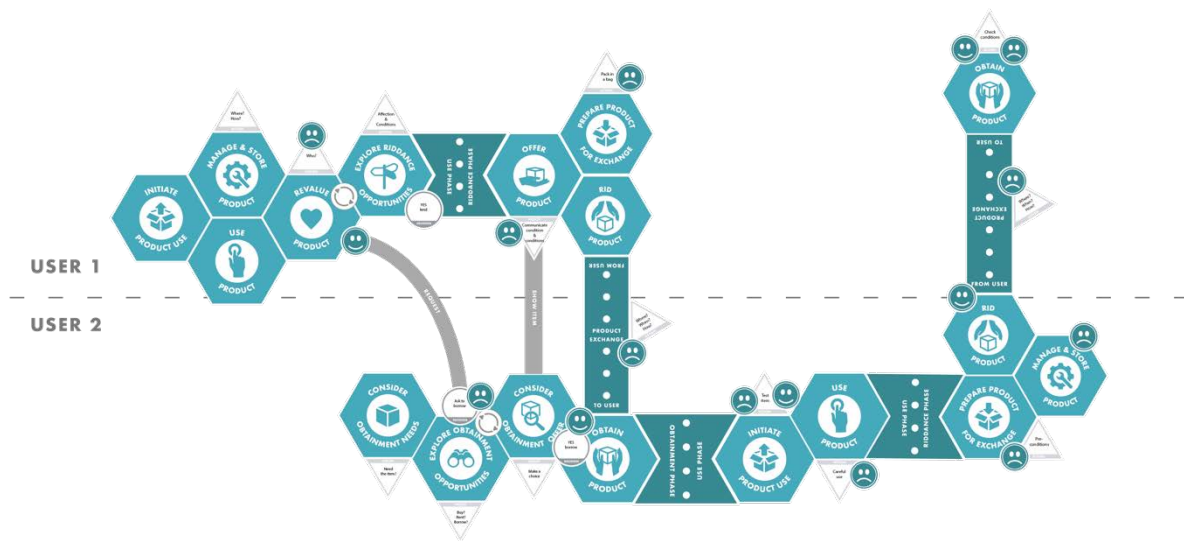


Figure 27. Illustration of the first journey map of what a sharing process could look like today.

JOURNEY MAP

How people might share items with Sortapp?

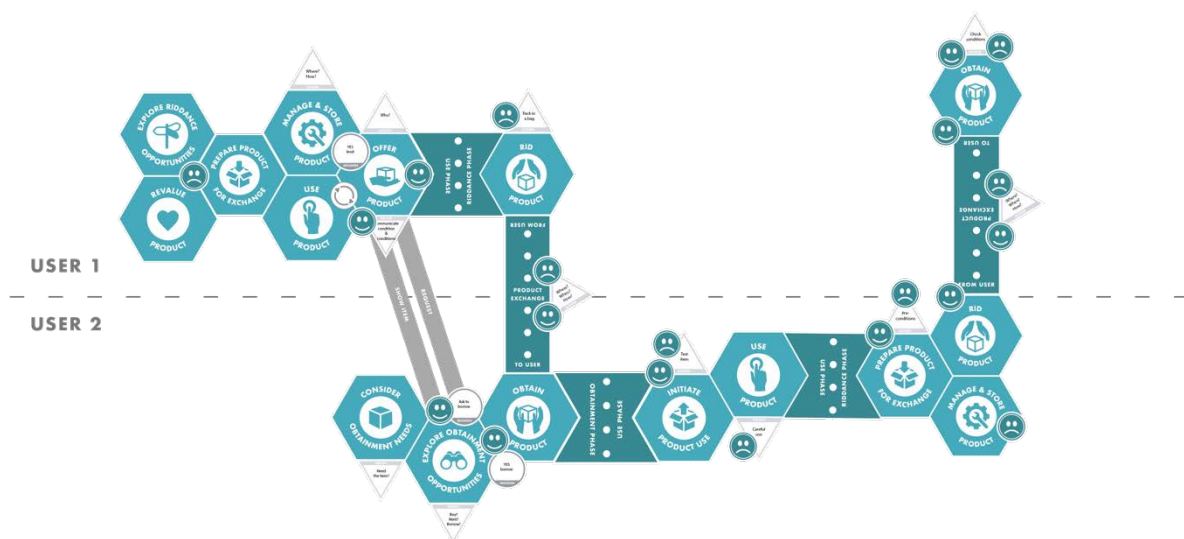


Figure 28. Illustration of the second journey map, describing what a sharing process could look like with Sortapp.

The journey map method showed the different activities clearly and helped identify critical activities and actions in need of development. The goal was to eliminate the so-called pains (the sad smiley faces). The journey map was divided in six different parts:

1. Use phase of the jacket for U1.
2. Packaging and lending of the jacket for U1.
3. Searching, asking around, wanting to borrow the jacket (U2).
4. U2 using the jacket.
5. U2 stores, takes care of the jacket and returns it.
6. U1 retrieves the jacket, checking the jacket if it is in good condition etc.

The difference between the first journey, without Sortapp, and the second journey is shown mainly in the first three steps, mentioned in the method and shown in appendix X. The map showed that the pain for U1 was who asks for the item and the evaluation activity of the product regarding who is asking. U1 also gets very happy for receiving the question, by feeling helpful to a neighbor, shown in figure 29 in the first journey. The second pain showed to be communicating rules and conditions applied to the item, for the person borrowing it (U2). U2's problems and pains were shown in the activity of asking the question of borrowing the ski jacket, not knowing who actually owns a ski jacket to lend. This causes the probability of having to ask several people to find the right ski jacket, shown in figure 30, which can be seen as annoying and time consuming.

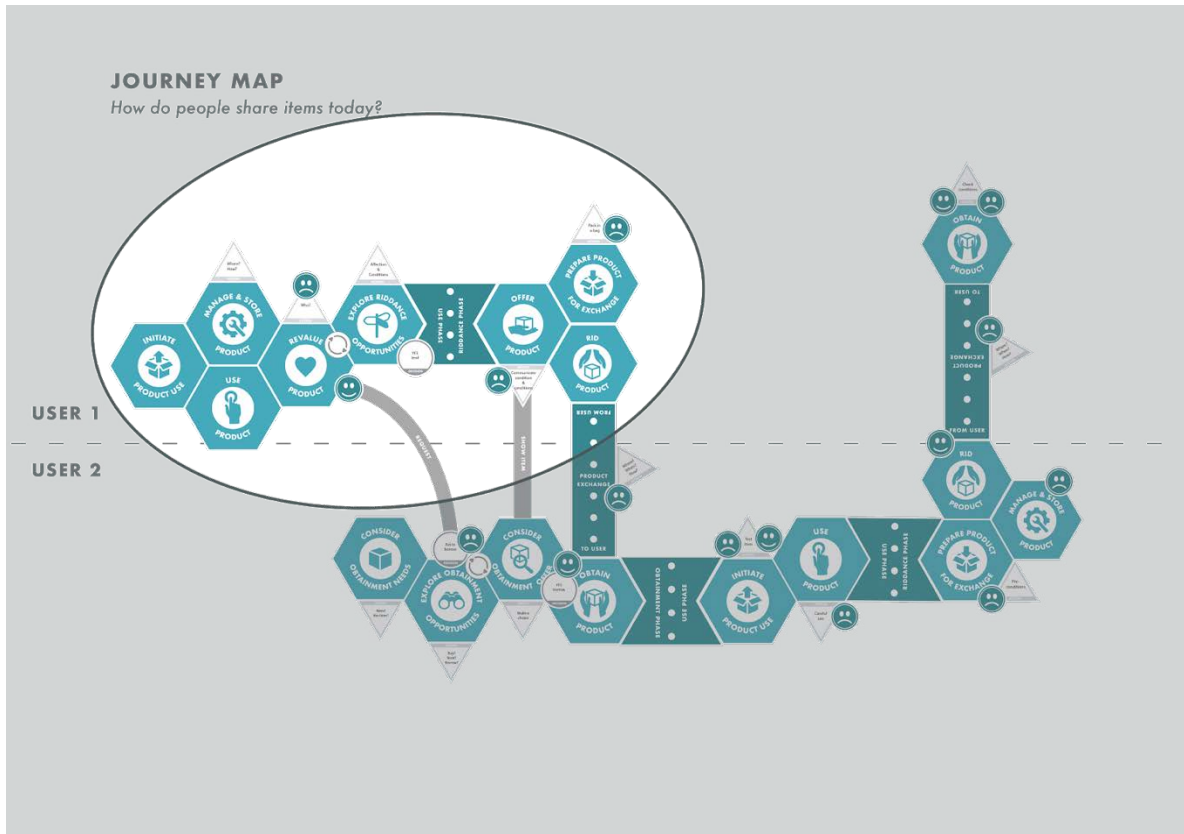


Figure 29. Illustration of the first journey map, highlighting the first 2 parts for U1.

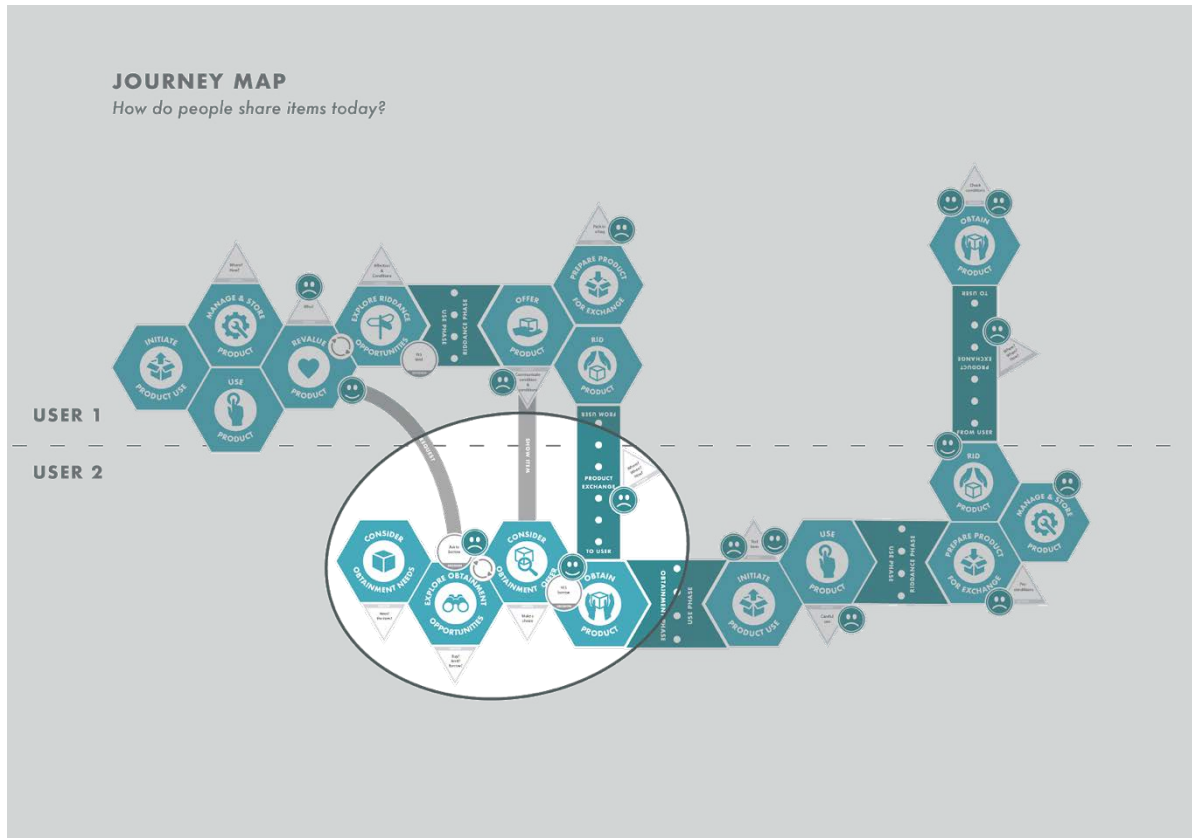


Figure 30. Illustration of the first journey map, highlighting the 1 part for U2.

The positive changes for U2's journey are shown in the journeys second part, seen in figure 31. A positive change in the search for an item to borrow activity has been accomplished by eliminating the feeling of being needy by not having to ask many people. The application presents the item for U2 and which terms and conditions the item requires when borrowing. The difference in U1 journey is the ease in activities during the exchange but also that feelings and experiences have been improved regarding lending the item to certain people, shown in figure 32. Although activities have been added to U1's journey; being forced to add the items with pictures and information in the application, the journey still facilitates the main goal of lending process for both users, shown in figure 33.

Figure 31. Illustration of the second journey map, highlighting the first part for U2.

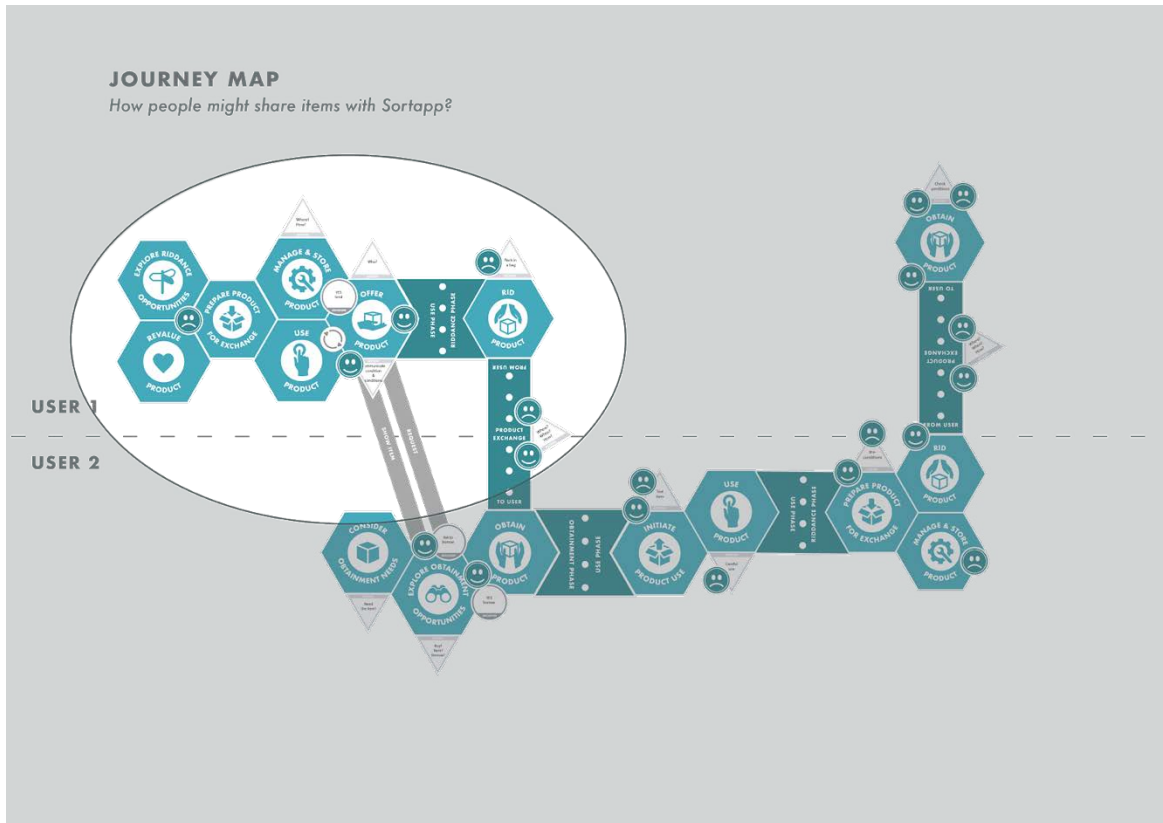


Figure 32. Illustration of the second journey map, highlighting the first 2 parts for U1.

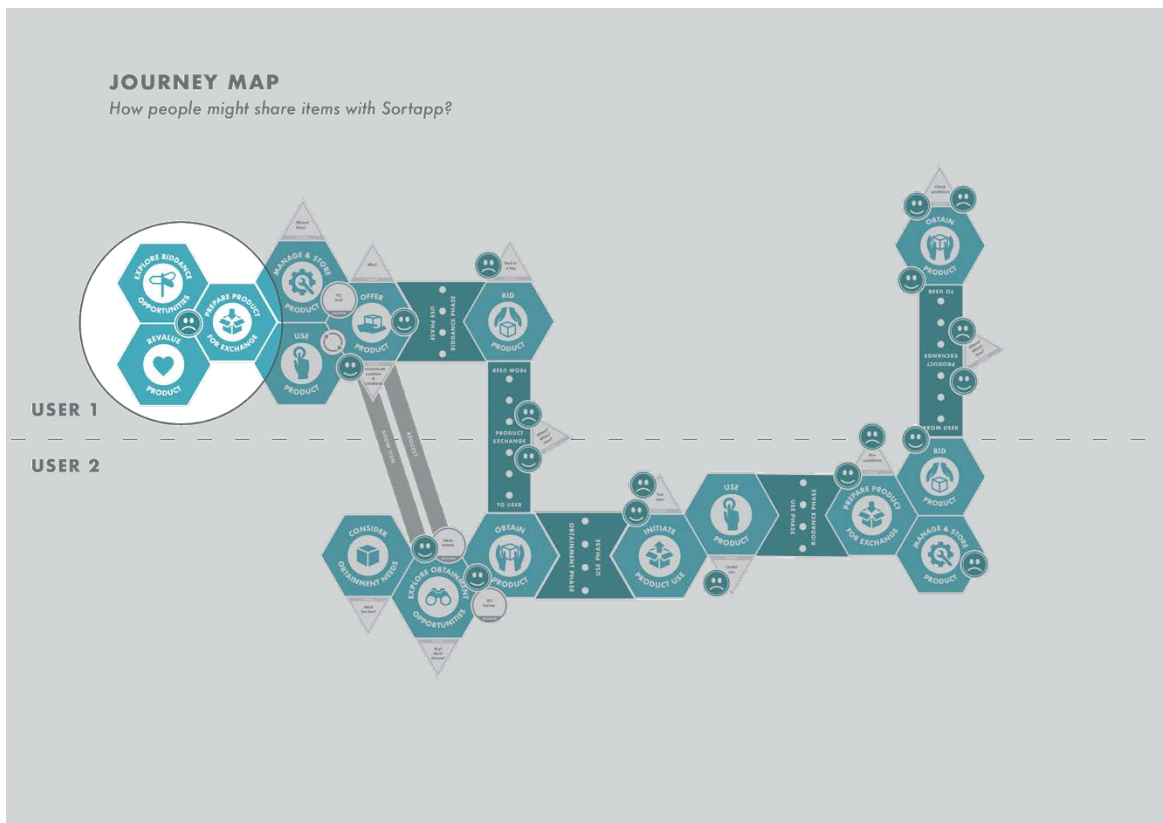


Figure 33. Illustration of the second journey map, highlighting the first part for U1.

The last parts of the map, part 4-6, did not differ much between the two journeys, therefore these parts were excluded in the development, the issues regarding using, storing and managing the item is not something the application can change in this stage, shown in figure 34 & 35. Therefore, the decision of prioritizing the parts of the sharing journey listed below was made:

1. Simplify the activity of adding items to the app and facilitate the communication of terms and conditions regarding the items to others.
2. Ease the riddance phase of lending the product by facilitating the communication process with other conversation platforms.
3. Facilitate the search for items, communicate the terms and accessibility of the item in a clear way.

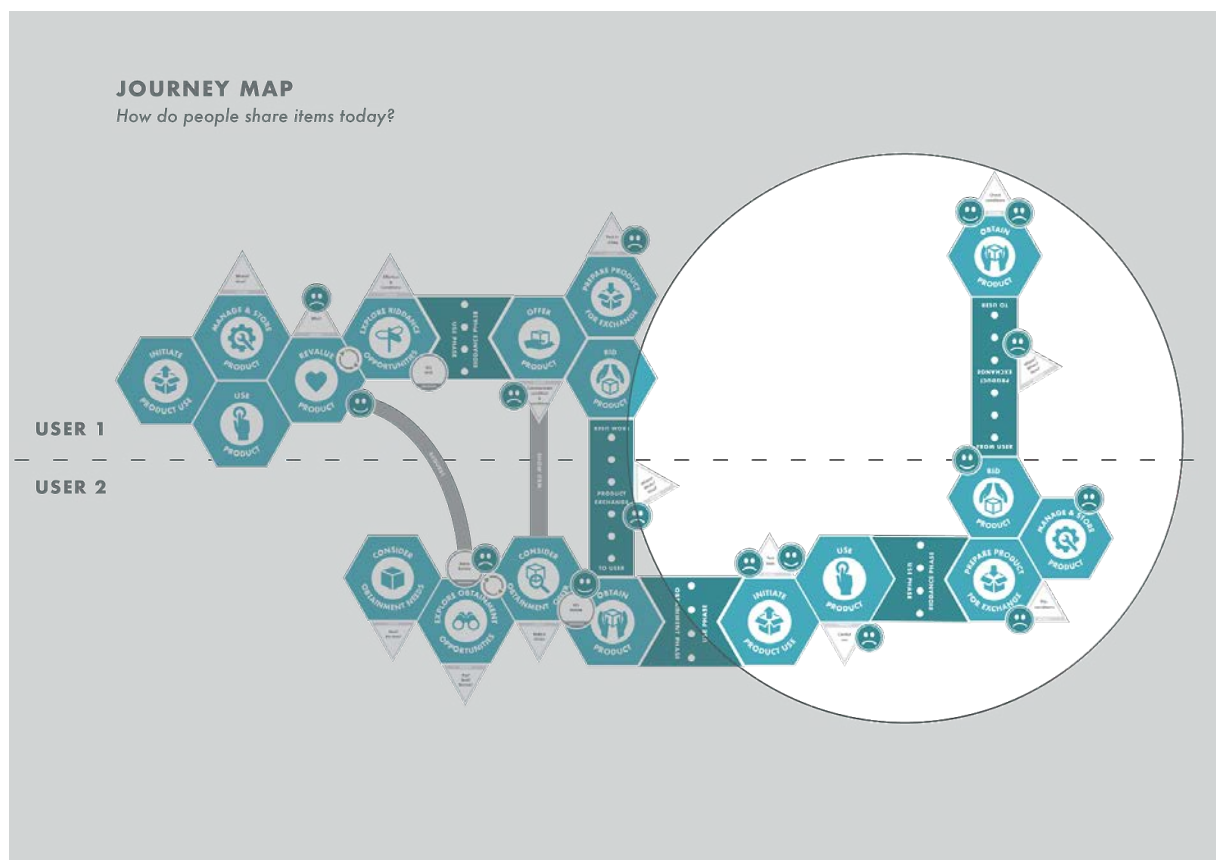


Figure 34. Illustration of the first journey map, highlighting the last part for U1 and U2.

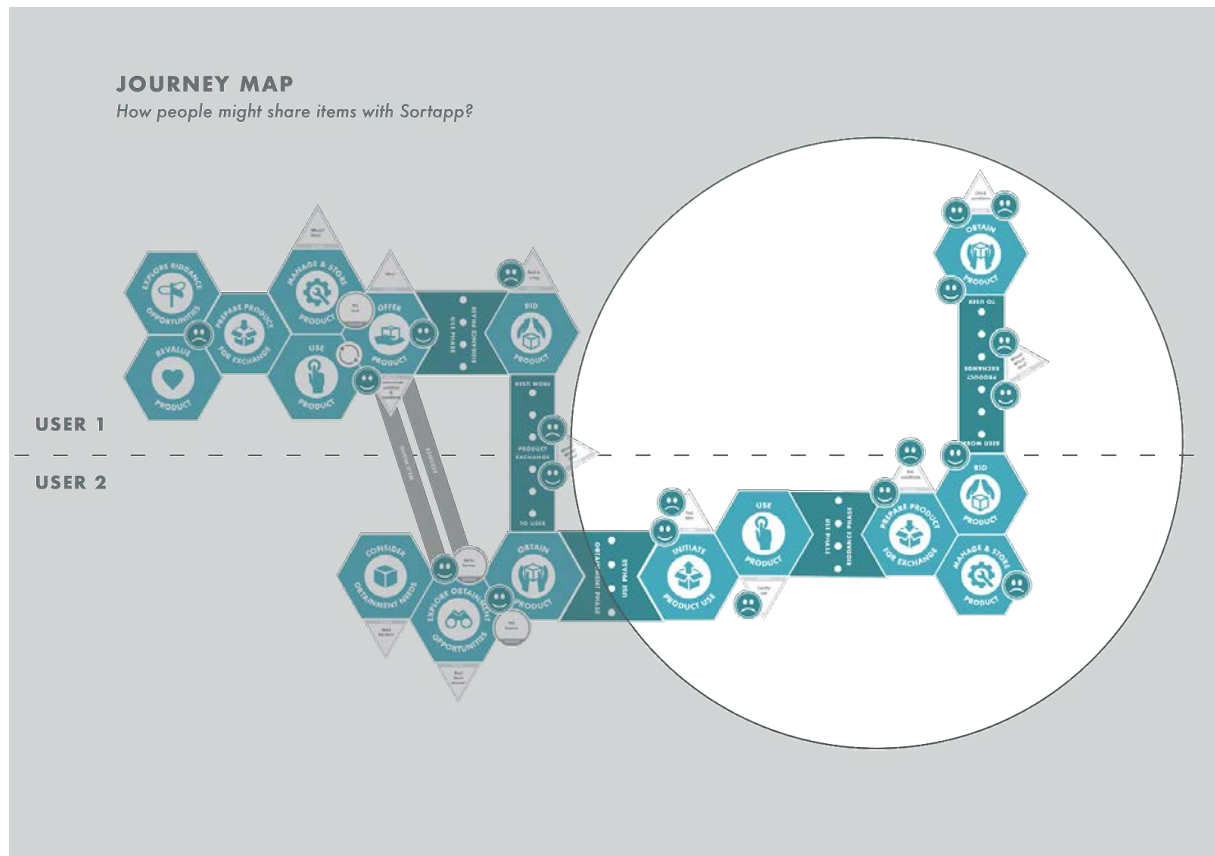


Figure 35. Illustration of the second journey map, highlighting the last part for U1 and U2.

4.2.5 Conclusion Phase 2– Prioritizing sharing activities

During the second phase the hypothetical target group and persona in chapter 4.2.1 helped identifying a group of people to distribute a second survey that resulted in important answers and arguments, on why and how people share. The main issues identified was **asking the question** of lending items but also the problem of trust, when to return the item and in what condition it was returned etc. A need in improving communication and presenting the accessibility of items to share was defined.

Secondly the result of identifying the different Sortapp members in chapter 4.2.3 showed the importance of receiving information and notifications of scenarios that can occur. The scenarios helped the project and Sortapp view the different risks a user may encounter when managing storages and inviting other users to share. Lastly the analysis of the Journey map resulted in three concluding issues to be solved to facilitate the process of sharing items through Sortapp:

1. Simplify the activity of adding items to the app and facilitate the communication of terms and conditions regarding the items to others.
2. Ease the riddance phase of lending the product by facilitating the communication process with other conversation platforms.

3. Facilitate the search for items, communicate the terms and accessibility of the item in a clear way.

The three issues above were the main problems found and prioritized to be able to create ideas and concept in upcoming phase of the project.

05.

PHASE 3

Designing concepts

The chapter is a presentation of ideations and concept generations with the results from phase one, Exploring Sortapp v.1.0, and phase two Analyzing the sharing processes.

5.1 Phase 3: Ideation, concept generation & evaluation methods

This chapter presents the methods used during the project to create a final concept. The methods are presented in the same sequence they have been completed during this process. The ideation phase has been an iterative process by re-sketching ideas, and the methods used have overlapped each other along the process to achieve reliable ideas as solutions to the outcome from phase one and two.

5.1.1 Ideation base

With the existing application used as a foundation to generate ideas on how to share items, boxes and storages in Sortapp, the basics were set to their framework. As the thesis began with testing the existing app (v.1.0) in various ways, the results of the tests had already been communicated to Sortapp and some changes has been made by the company during the project. The ideas for the changes, presented in chapter 3.2.5, were generated from the user's tests of app v.1.0. Where the interaction was tested and analyzed to improve Sortapp.

Due to the almost finished basis of the application that exists today about sorting items, the focus was set to develop the next important feature for the application; Sharing. The prior study of sharing products and the survey on consuming showed that sharing was something that people want to do but was seen as difficult, shown in appendix VIII. After conducting a thorough analysis with the journey mapping in chapter 4.2.4 the priority was set on which parts were in need of development to facilitate sharing for people.

Firstly, deep discussions about the prioritization found in the journey mapping was completed. Thereafter brainstorming and sketching ideas during discussions about the three chosen parts from the findings in phase 2, focusing on one part at a time:

1. Simplify the activity of adding items to the app and facilitate the communication of terms and conditions regarding the items to others.
2. Ease the riddance phase of lending the product by facilitating the communication process with other conversation platforms.
3. Facilitate the search for items, communicate the terms and accessibility of the item in a clear way.

Eventually the problems were separated in different needs, transformed into certain activities connected to the app. The ideation process started out by sketching ideas on different interaction features, sketching on one wireframe by using the method crazy eight (I am not my pixels, 2017) where the sketching was made one by one, sketching eight ideas of the same frame, then moving on to the next etc. Thereafter

fast sketches were made during discussions and brainstorming sessions, where various ways of parting pictures, different icons and symbols was sketched upon for the different parts in the discussions.

5.1.2 Concept generation

The ideation was divided into four activities users needed to complete when sharing and finding items to borrow:

- Adding and sharing single items in a simple way.
- Adding and sharing multiple items in a simple way.
- Searching for items/boxes/storages that contacts share.
- Searching for a specific contact's shared items/boxes/storages.

By using the fast sketches that were made during the ideation as a base, additional and refined sketches made on printed iPhone X wireframes were completed, showing details. The wireframes were printed to better understand the size of the frame and also to generate additional ideas and concepts. During the process various ideas of wireframes with examples of footers/tabs, symbols/icons showing, but also ideas of the entire frames were discussed. The sketches present a clearer visualization of the concepts.

During the session additional wireframe/process changes were sketched on A3 paper, with iPhone X wireframes, for a clear visualization. The first conceptual sketching led to further ideas and concepts; as the Notification center and the simplifying of multiple pictures. Studying other applications gave important information on what was commonly used and understood as intuitive. Two important questions that arose were:

- What do I understand as intuitive interaction?
- Which parts and symbols do I recognize from other applications?

The questions were present during the user study and have worked as reasoning questions during the entire project.

5.1.3 Prototyping

To evaluate the sketched concept a first meeting was held with the mentors from Chalmers and from Sortapp. New information was received on the latest version of Sortapp, which adds additional insights and feedback on how to change the concept to fit the application and prepare for the concept prototyping in Sketch/Adobe XD.

Sketch is the tool Sortapp uses to create prototypes, therefore a test was made with the program to try creating the first conceptual features. However, the software is not available for students. Adobe XD was therefore chosen as a prototyping tool to work with in this project. When transferring the conceptual wireframe sketches to Adobe

XD, the main prototypes from Sortapp were used as a basis to maintain their core framework. Their design language and semantics were included; such as color, font and icons. Working with the concept in Adobe XD offered the possibility to create all prototype pages. Also being able to present the concepts clearly and detailed. Showing a demonstration of an actual visual feeling and visual experience of the concept. The prototyping was completed on one part at the time, starting out with one prototyped page, evaluating the prototype through discussions, making changes if needed and thereafter moving on to the interactive prototyping. The interactive prototyping was made by connecting a certain part of the page to the next page, and when clicking on that part one could create an interactive prototype chosen to work in a certain pattern.

5.1.4 Testing prototypes

The final part of the project was the evaluation of the conceptual prototype, accomplished in Adobe XD. The prototype was accessed by downloading a link to an iPhone and it was displayed on a website for the test participants to interact with. This prototype testing method was chosen as it was the simplest way of testing an Adobe XD prototype. There is no option to test it in Invision like previous prototypes, found in chapter 3.1.5, created by Sortapp. This is due to the lack of external programs for Adobe XD.

The tests were preplanned, and a script was handed out to each test subject. The script was divided into five activities listed below, also shown in appendix XI:

1. Search for an item
2. Add multiple items
3. Add a single item
4. Search for a contact's shared items/boxes/storages
5. Test out two examples of notification center/newsfeed

The test was made separately by the participants, with a short-written explanation of the given tasks, that was handed to them. The tests were completed in a silent environment to be able to record the comments during the test session by filming the interaction. A total of seven test subjects completed the tasks, all students at Chalmers, ages 24-28 years. After all tests were completed a quick analysis of all participants interaction and comments was discussed and documented. A more thorough analysis was achieved by reviewing the videos and listing to the struggles that are shown.

Lastly a meeting was held with Sortapp. The presentation was held to show a recorded interaction of the five activities listed above, as well as showing the prototyped pages and discussing each additional page and feature added to Sortapp. The feedback was

used to improve the conceptual features further by relating their comments to the test subjects' experiences.

5.2 Results Phase 3: Adding sharing features to Sortapp

The results of the methods described in phase 3 are presented below. The chapter explains the results of the ideation, leading to the conceptual sketches and then the sketches of the prototype in Adobe XD. The prototypes were tested to evaluate the concepts. The results below are presented in the same sequence as the methods in the previous chapter.

5.2.1 Ideated solutions

The three areas chosen from the journey map were used as a base to ideate around. The activities were divided into features during the ideation phase to generate concepts. This resulted in a definition of three important features to explore.

Adding and sharing single and multiple items in a simple way. This feature is related to the journey map area of simplifying the activity of adding items in the app and facilitating the communication of terms and conditions regarding the items to others. Also, to ease the riddance phase, the lending of the product, by facilitating the communication process with other conversation platforms.

Searching for items/boxes/storages that contacts share. Relates to the journey map area of facilitating the search for items, communicate the terms and accessibility of the item in a clear way.

Searching for contact's items/boxes/storages. Relates to the journey map area of facilitating the search for items, communicate the terms and accessibility of the item in a clear way.

The first method used was crazy eight (I am not my pixels, 2017) and that did not go as planned due to Sortapps set basis that was already determined. The possibility of thinking out of the box was hindered. However, the method, crazy eight, led to a few fast sketches on the three important parts described above. The sketches led to wireframe sketches on different interaction ideas which resulted in a good basis for further ideation and iteration of the sketches. Also, the three features that originated from the journey map analysis where further divided into four parts/features:

- **Adding and sharing single items in a simple way.**
- **Adding and sharing and multiple items in a simple way.**
- **Searching for items/boxes/storages that contacts share.**
- **Searching for contact's items/boxes/storages.**

The early feedback from the first test subjects in chapter 3.1.3 added important information and gave additional insights on what icons the participants recognized and what they associate them with. Intuitive symbols and icons were shown to be crucial for the interaction with the app and was therefore very important to bring to the ideation phase.

The sketches on the first part, **adding and sharing a single item**, have a similar basis and foundation as the developed feature in Sortapp v.1.0 of adding an item. This foundation was seen as a well-developed and intuitive function in the early user tests, found in chapter 3.2.2, and therefore did not need additional adjustments. The additional feature to this function of adding an item was to be able to share the item when adding. This was solved by creating an option for sharing, adding an icon symbolizing a sharing function to the feature; adding an item. Designing and adding a simple icon for a sharing feature was thought to facilitate the process of sharing an item when adding it to Sortapp. Simply by visually communicating the sharing option in the process of adding an item and offering accessibility to the feature.

By pressing the sharing icon, the location, an address, is determined. The location of an item is important as people do not want to travel far to retrieve an item to borrow. Informing users of the address and location can help users in their selection process of which items to borrow.

Conditions that apply to the item can be chosen to enhance a sense of insurance and reliability, as this was identified in the journey map as an obstacle, that the user experienced when lending items to others. Applying a condition generates a good communication between users, regarding shared items. Informing the borrower what conditions applies to the item, when it is borrowed, will simplify the transfer of the item, which was identified in the journey map as a pain/negative experience.

The last step in the sharing process when adding an item to Sortapp is to choose with whom to share the item with. The solution to this is to have contacts to share with, generating a contact list. The contact list would consist of friends and family, or others. To facilitate the process of sharing an item, the contacts needed to be accessible. An idea was to be able to create groups, much like in other communication tools and applications. The groups help the users quickly share an item with many people simultaneously, rather than having them selecting contacts one by one. In addition to facilitating the selection of contacts, the contacts the users shared with the most, are presented at the top of the list. These are listed as favorites to enhance the accessibility and facilitate the process. All solutions were based on the obstacles found in the journey map and are related to facilitate the process of adding an item to Sortapp and sharing with friends and family. The solutions offer options of ways to communicate information about the item to specific contacts.

The process of **adding multiple items** was ideated in the same manner as **adding a single item**. However, the function to divide items in Sortapp v.1.0, Single and Separate items, showed difficulties in the first user studies found in chapter 3.2.2. The existing solution was hidden in a slide up bar in the footer which was unclear to the users as the previous page did not have an interactive footer. As Sortapp expressed early on in the project, the need of adding several items at once was identified as a

prioritized function to develop. Therefore, an ideation regarding this function in addition to a sharing feature was completed. The solution; highlight the possibility to divide items, to separate pictures into several items, to add and share in Sortapp. Placing titles that indicate this function, at the top of the page, thought to bring attention to the feature. The titles need to be clear for the users to understand what the features signify, hence the titles Single and Multiple. When Multiple is chosen the same interface as Separate items in the app v.1.0 is presented as it was seen as intuitive. The sharing feature is placed on this page to be easily accessed and the steps of the sharing process are the same as when adding a single item and sharing. Designing a feature that is consistent even when accessed through different sections of the app was thought to enhance the intuitivism and also create a positive experience for the users. Intuitivism was shown during the early user tests, found in chapter 3.2.2, to be crucial when users are introduced to a new app.

The third part, identified as an important activity from the journey map, was **searching for items**. This is a feature that does not exist in the foundation of Sortapp v.1.0 and could therefore be widely explored. Placing the search feature in the loop icon in the footer, on the main page, creates an obvious access to a search function, as a loop is often recognized as an action of searching for something. When entered, the search feature offers the user an opportunity to search by typing an item name and selecting a distance. These two options were seen as most important when searching for something to borrow. The survey results found in chapter 4.2.2 showed that participants felt that sharing was most comfortable accomplished when done in a close area, that it does not imply long travels to retrieve or return the item. The search bar is identical to all typing bars in the app to create a consistency throughout Sortapp, indicating the function of typing. Different ideas on how to display the choice of a distance were explored. Ideas such as typing, scrolling through a list and presenting alternatives in buttons to interact with were quickly sketched upon to have a wide spread of ideas to choose from.

When an item and/or a distance is chosen the user is directed to a new interface. The interface presents the result from the search and quick sketches were made on how the results could be presented in that view, depending on what was seen to be important information from the survey and the journey map in chapter 4. The search results are also divided in a list view and a map view to create an adaptivity to the feature. To communicate the information of the items, users can access an interface presenting a full view of the item with picture and notes. This interface can be seen as similar to a shopping experience, creating an opportunity for the users to browse through, in a recognizable manner. To borrow an item three parts were discussed to be included in the process of completing the task: accepting conditions applied to the items, choosing dates of when the item is needed and being able to contact the owner. Different ways of presenting the choice of dates were quickly sketched to generate various alternatives to develop the concepts further.

The fourth part generated from the journey map, **searching for contacts items/boxes/storages** is also a new feature to be added to Sortapp. During the initial user test, inviting a friend in chapter 3.1.5, participants pressed the icon with two people in the footer as they expressed that they recognized this icon as a symbol for contacts. Therefore, the choice of putting the search for contacts behind this icon felt obvious. Similarly, to the appearance of separation of single and multiple items, a top bar choice on top of the page is used, one for contacts and one for showing shared items and storages. The possibility of scrolling for the right persons item/boxes/storages is possible under the shared title. The possibility of searching or scrolling for a certain contact is possible under the contact title.

All ideas above were sketched on blank papers to discuss each step and to be able to ideate, analyze and evaluate before turning the ideas into refined sketches and concepts.

5.2.2 Conceptual features

The ideations described in the chapter above needed to be further developed and evaluated to be presented as concepts. The four areas that were explored and ideated around were outcomes from the journey map and survey results from phase two as well as survey results and user tests from phase one. To refine the ideas from the ideation phase, the sketches were clarified on printed wireframes.

Adding items & sharing

In figure 36 and figure 37 the first part of the concept is presented; **adding a single item** and sharing it with a contact. This idea and part of the concept includes an adding of the sharing feature to the existing adding item feature. Therefore, the focus was directed on how the sharing feature could be added without complicating the existing process of adding an item. The sharing feature is an add on, it should not interfere with what Sortapp already has developed. Instead the idea was to create greater use for the app and include other potential users with other goals than simply storing their belongings in an organized manner. The survey results in chapter 4.2.2, confirmed that a potential user group consists of people that want to share items and adopt a circular consumption belief.

The first steps of the concept, adding an item, is presented in the sketches in figure 36, as it is developed in Sortapp today:

1. Pressing the add button, see wireframe 1 in figure 36.
2. Taking a picture of the item, see wireframe 2 in figure 36.
3. Looking at the taken pictures in big size by only pressing at the miniatures, see wireframe 3 in figure 36.

The added share feature is presented in the ideation phase as an icon symbolizing two people, which was seen in early user tests. Different placements of the icon were discussed when sketching to find the most accessible and intuitive indication of the feature. This resulted in placing the icon in the bar beneath the picture of the item next to the notes icon. This was believed to be a good placement as it is next to an important feature, which was seen in user tests as a well-established and used feature when adding an item to Sortapp. Many tests subjects wrote at least something to enhance the information of the item, when completing the task of adding an item to Sortapp, found in chapter 3.2.3. Also, after completing the notes it was often seen that the test subjects would continue scanning the bar to see what the other features implied. Therefore, it was thought that placing a sharing features next to the notes feature would guide the users to new features and options of use.

When the sharing icon is pressed and activated the following steps are visible:

- choosing a location, see wireframe 7 in figure 36.
- choosing terms and condition to apply to the item, see wireframe 8 in figure 36.
- choosing with whom to share the item, see wireframe 1 in figure 37.

These steps were found as important communication topics to facilitate the sharing process. Location is set to a default of adding the location by an auto selection of the address where the picture is taken. However, the choice of searching for an address was also added. The solution of creating options for the user is made to enhance flexibility and offer customization in the app which is thought to create a positive experience.

When a location is set a condition to apply to the item is needed. Offering different conditions to choose from can hopefully encourage more users to share as it facilitates the communication, which was seen in survey result from chapter 4.2.2 as one of the most crucial barriers of sharing. The conditions are presented as examples; a default condition, two examples regarding specific groups of items and an option to write a condition. The options are to guide the user in the sharing process, to facilitate the process by offering the user alternatives to be able to adapt the feature to their needs.

The last step is to choose friends and contacts to share the item with, which can be done in various ways. The contact list is quite similar to the existing solution in Sortapp v.1.0. As explained in the ideation phase, found in chapter 5.2.1, the presentation of contacts was essential for a simplified sharing process. Creating accessibility to the most needed contacts by placing them at the top of the list is a solution. Offering the possibility to type in a name to find a contact or choose from the list below the typing bar was sketched as this is a common solution found in many communication tools and is therefore familiar to many users. When the choice of friends to share with is made, the items is added in the chosen virtual storage and shared with the Sortapp

contacts that have been selected. To confirm the action a notification is shown on the main page, as seen in wireframe 2 in figure 37. A confirmation was added to the concept as it was identified as an important part of completing a process in an app. In the early user test on Sortapp v.1.0, found in chapter 3.2.3, participants expressed a positive experience when receiving a notification, implying that the task was indeed accomplished.

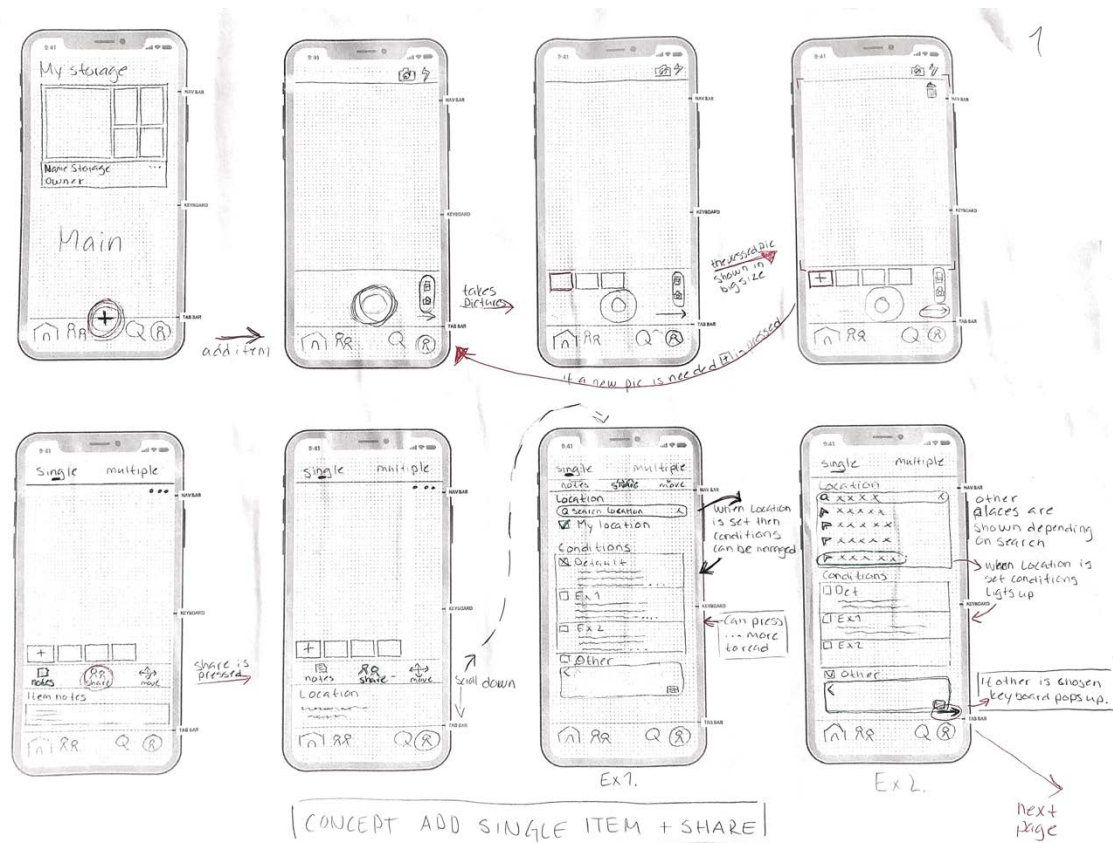


Figure 36. Handmade sketch of the final refined sketch of adding and sharing an item, part 1-8.

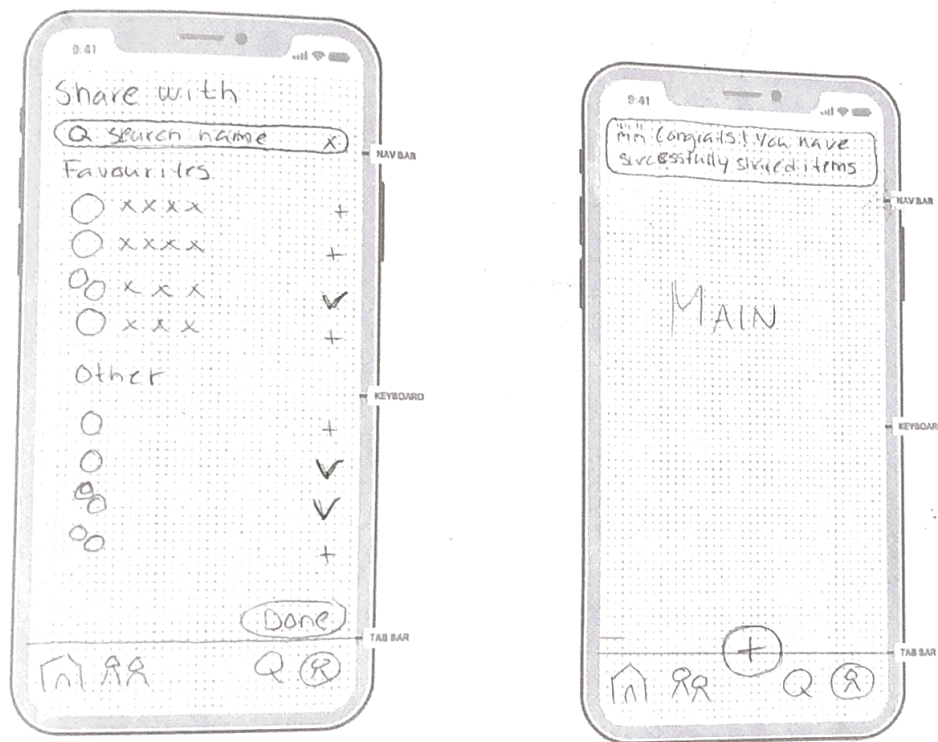


Figure 37. Handmade sketch of the final refined sketch of adding and sharing an item, part 9-10.

Adding multiple items & sharing

The second ideation area that was further developed and explored was adding multiple items and sharing with friends and family, see Figure 38. The first steps of adding the items, taking several pictures is equal as in the app, v.1.0, and in the concept of adding a single item and sharing, mentioned above:

1. Pressing the add button visually presented with a (+) icon.
2. Taking a picture of the items.

An alternative solution to divide added items, to create several items to add, is to place the feature in a title that signifies this function, Multiple. The placement of the titles Single and Multiple at the top of the page was chosen to guide the users through the process and offer the option to separate a single item, consisting of several pictures, to multiple items instead. When switching from Single to Multiple the pictures are divided and are shown as singles, see wireframe 1 in figure 38. A switch function from one title presenting one interface to another title presenting a different interface is an established function in the app v.1.0 and was therefore seen as a possible solution. When generating ideas, consistency was a keyword as it creates an intuitive and coherent design throughout the app. Hence the use of existing solutions to new concepts.

The Multiple interface is, as previously mentioned, similar to the existing interface and the feature Separate items in app v.1.0. Presenting all images taken by the user to be able to edit the items, see wireframe 1 in figure 38. Another feature that was seen as important and valuable during the concept generation was the possibility to edit items separately, one by one, sketched in wireframe 2 figure 38. As mentioned in chapter 5.2.1 adding notes to an item was an important feature to the adding of items process. It was therefore seen as a feature to implement in this concept as well. However, the notes feature is only accessible when editing items one by one, and not in the view where all images of the multiple items are displayed. The notes feature was seen as only valuable when handling one item at a time. Adding notes to all images at once when separated was discussed as meaningless and was changed from the existing feature in Sortapp v.1.0.

Another added feature to the Multiple interface is a select button placed above the images, shown in wireframe 2 figure 38. This feature allows the users to select several images to handle at once. The two icons sketched below the images represent two features, sharing and moving. The moving feature can be found in Sortapp v.1.0 and allows the users to move the item from one storage to another storage in the app. However, the icon found in Sortapp v.1.0 was expressed as confusing in the early tests of the app, found in chapter 3.2.3. Many participants associated the icon with a shooting target (aim) or a map target. The icon was therefore changed in this concept to intersecting arrows, which was an icon used for the move feature in a different interface in the app v.1.0 and was more recognizable as a move function. The share icon is placed next to the move icon to increase accessibility. The share icon implies the same share function and feature found in concept of adding one item and sharing. Setting a location, choosing a condition and selecting with whom to share with. This is to create cohesiveness and consistency throughout the app.

When exploring the different needs, the users might encounter in the Multiple feature and its interface, an additional idea was added to the concept of adding multiple items and sharing. A function of merging images to one item is thought to bring more variation and adaptation to the user needs. A drag and drop function was thought to be a solution for merging images, seen in wireframe 3-4 in figure 38. When the images are merged it is visually confirmed by dots on the bottom center of the image, indicating more images are accessible. The idea was an outcome of the early user test of the app v.1.0, found in chapter 3.2.2, where the participants tried to use a drag and drop function for various task. This lead to believe that the function is well known and an established function for smartphones users. It is also a function Apple has chosen to group applications.

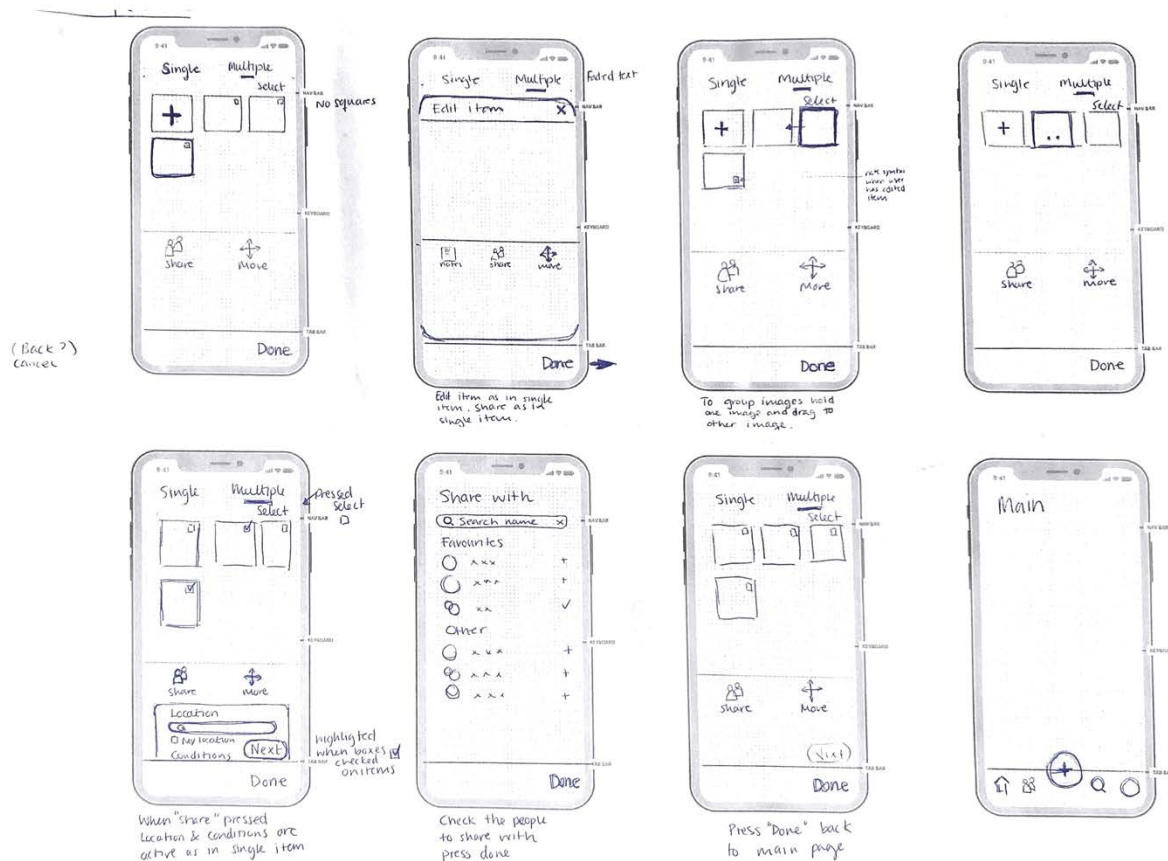


Figure 38. Handmade sketch of the final refined sketch of the last parts of adding and sharing multiple items, part 1-8.

Search for an item

The first refined sketches were made on small iPhone X wireframes. Shown in figure 39 are examples of how to search for an item by starting from the main page in the app:

1. Going to search from the tap bar.
2. Searching for the item and choosing a distance in what range to find the item.
3. Accessing a results interface where items are listed.
4. Choosing one of the items and accessing an overview of the item information.
5. Asking to borrow the item by accepting the terms/conditions, choosing a date when to borrow the item and if needed being able to contact the owner.



Figure 39. Handmade sketch of the first refined sketch of searching for a contacts storage, and two examples of a news feed.

Secondly additional sketches were made on bigger iPhone X wireframes, adding further details to the concepts. Creating more worked through and thorough sketches was important to understand and explain the ideas clearly and to be able to evaluate the concept.

Shown in figure 40 and figure 41 are the last refined sketches of the wireframes on the search for item concept. The wireframes visualize the journey from the main menu and goes through the same steps as mentioned above in figure 39. The conceptual ideas of wireframe 3 and 4 in figure 40, showing the maps result is further improved by designing two solutions to the interface. The first being a list of items beneath the map that can be explored by scrolling, seen in wireframe 3 figure 40. The second solution is having the list of items accessed by swiping, seen in wireframe 4 figure 40. A map was added as the distance to an item was identified as an important part of why people choose not to share and was seen as an obstacle that needed to be reduced. An option of switching from the map view and a larger list view was added to the concept for the users to be able to adapt the app to their needs. In wireframe 5 and 6 in figure 40, two examples of the list view are presented. The items are presented with an image, the item name, the name of the owner and the distance to the item. These three types of information were chosen to be presented as they were seen as the most necessary in this stage, of choosing to borrow an item, generating a

simple browsing interface. To retrieve more information about the items the user can access an overview of the item by pressing the item in the list, seen in wireframe 7 figure 40. The item is then presented in a larger image and additional notes are shown about the items and are displayed beneath the previously displayed information. Designing a clear and simple overview was thought to help communicate the items information in an engaging way, similar to a shopping experience. The last wireframe, wireframe 8 in figure 40, provides the important information about the conditions that apply to the item when borrowing it. These conditions are chosen by the owner and are required to be accepted when wanting to borrow an item. Selecting a date is the second task and is accessed by pressing the date bar in which a calendar appears. Having the users select dates of when to borrow an item was thought to help users gain a better overview of what they have chosen to lend and to whom. As more guidance was given to facilitate the process of sharing, the feature was thought to result in good user experience. The satisfaction of the experiences will encourage users to share their belongings with others and therefore reduce consumption. The previous ideation phase resulted in various ways of presenting the selection of dates, the end design is presented in the wireframes above. When selecting dates, the user has to first select a start date and then an end date in the calendar. The design is kept simple and similar to other calendar interfaces seen in various apps as it is recognizable and intuitive. The third button on wireframe 8 in figure 40 and wireframe 2 in figure 41 allows the user to contact the owner of the item. Figure 41 shows how wireframe 8 in figure 40 works during the interaction, showing the conditions and calendar, and lastly a notification appears when the borrowing request has been sent. The last notification in wireframe 3 in figure 41 was found to be important during tests made in the beginning of the project.

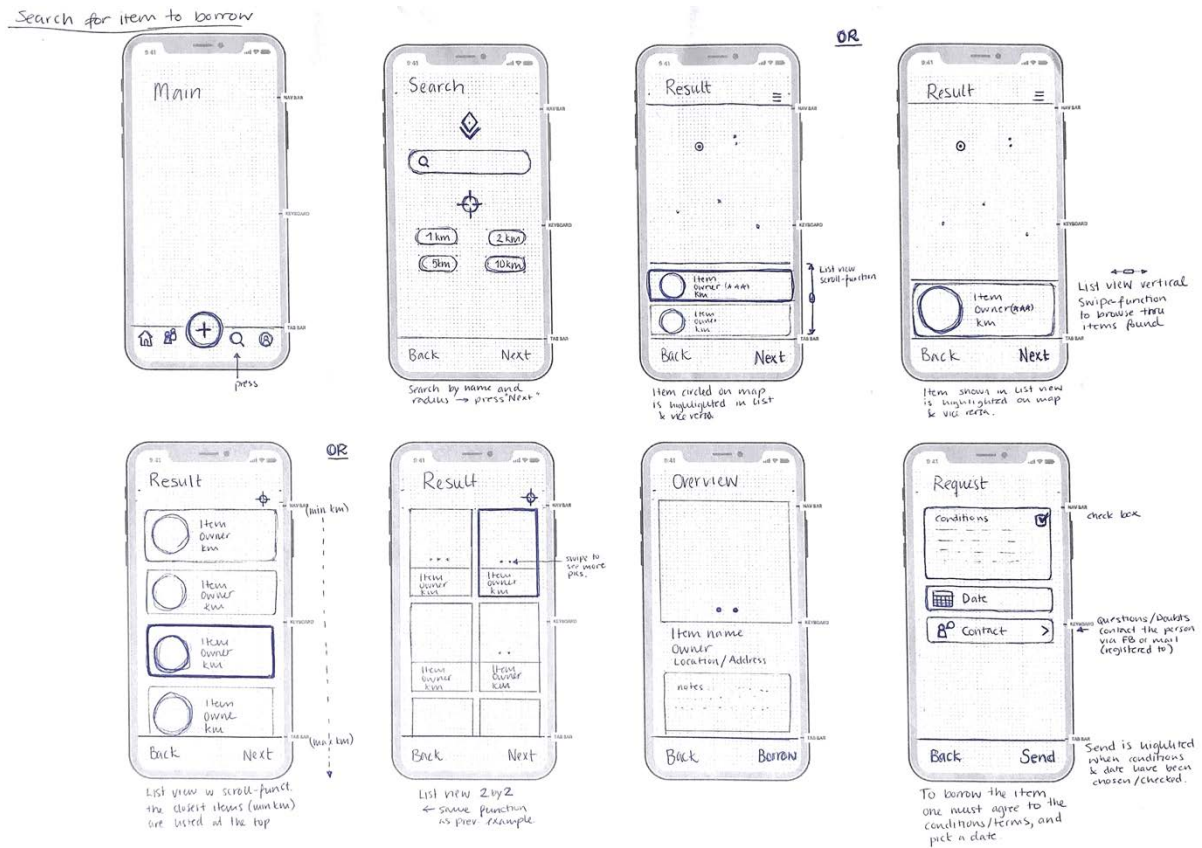
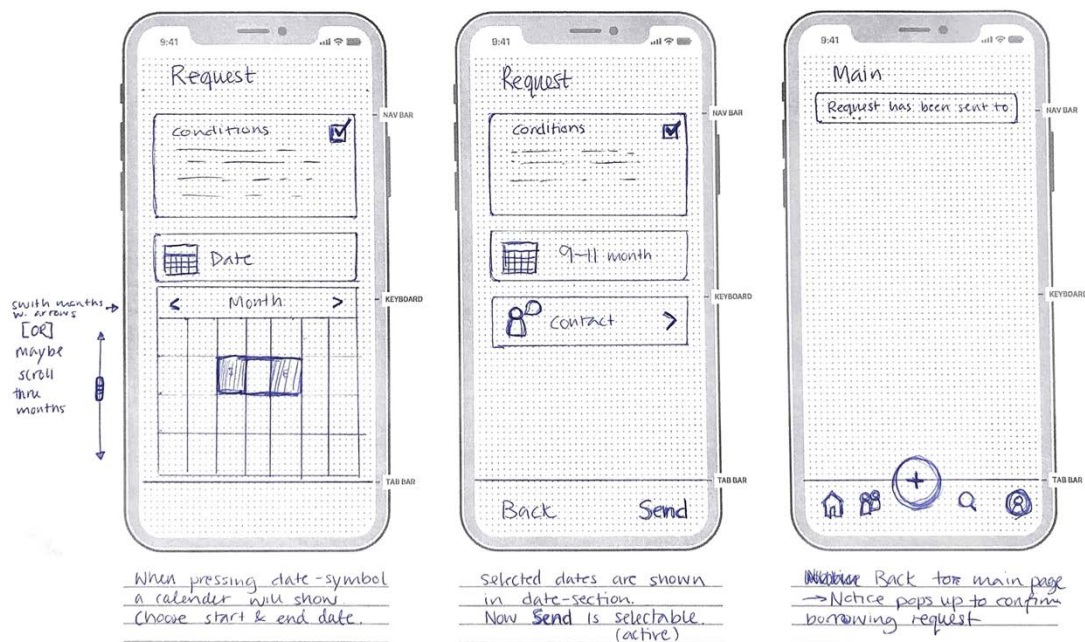


Figure 40. Handmade sketch of the final refined sketch of searching for an item, part 1-8.



Template Created by Matthew Stephens (matthewstephens.com)

Figure 41. Handmade sketch of the final refined sketch of searching for an item, part 9-11.

Search by contact

The next refined conceptual feature from the ideation phase was firstly made on small iPhone X wireframes, shown in figure 42. This conceptual feature includes the activity of how to search for a contacts storages/boxes/items that they have chosen shared with “you”, seen in wireframe 1-6. These are simple sketches on what is important to present on each interactive view.

The second row in figure 42, wireframe 7-9, shows two examples of where to present the “news flow”/notifications. As there is no feature in Sortapp v.1.0 that represents the gathered notifications and information’s that a user receives when completing various task, two solutions are created for further tests and evaluation. The idea of having a notification center originated from the user tests throughout the project, were participants expressed that confirmations generated a good experience. As the ideation and concept generation was focused on how to add a sharing feature to the existing foundation of Sortapp it was also thought to lead to additional information and notifications given to the users. A center/feature were the user can retrieve the information that has been given to them regarding their storages/boxes/items as well as when sharing items to friends and family was designed to enhance the organization aspect of Soratpp.

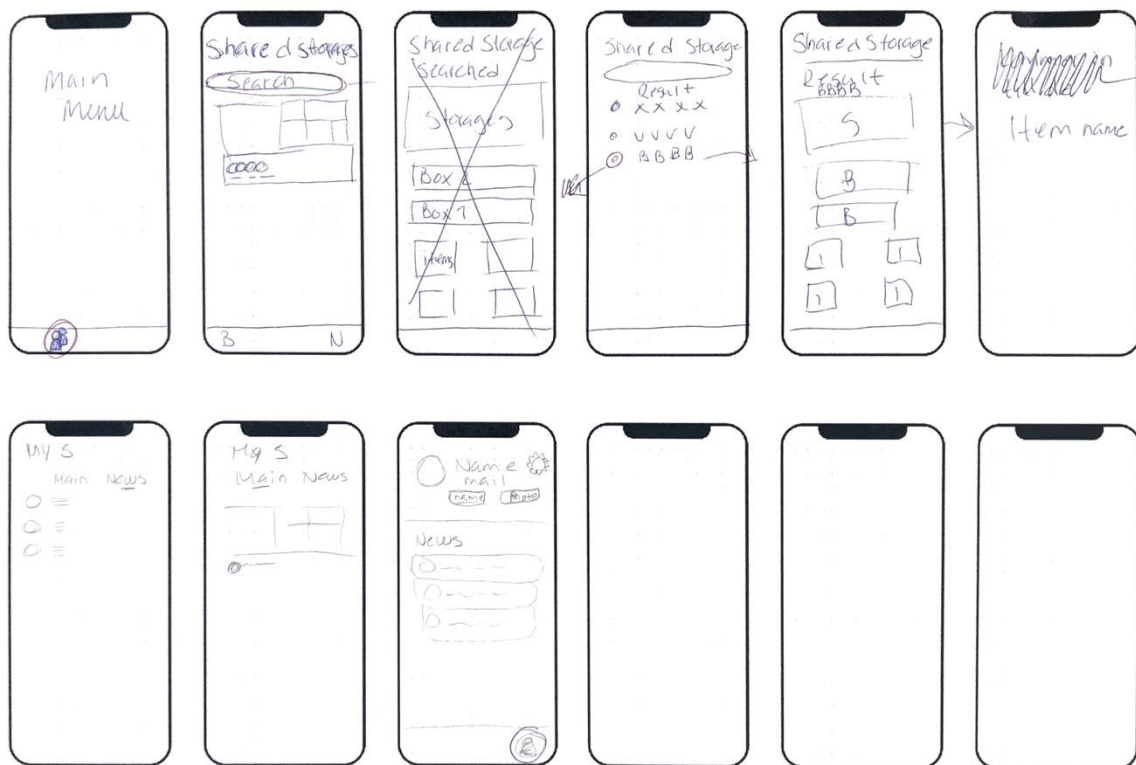


Figure 42. Handmade sketch of the first refined sketch of searching for an item (made by the authors).

Additional sketches were made on larger iPhone X wireframes to add further details to the concepts shown below in figure 43. The concept is not directly related to the most important parts found during the journey map analysis. However, accessibility to information was shown during user studies on Sortapp v.1.0 to be vital when sharing with friends and family. Therefore, creating access to contacts shared storages/boxes/items was seen as a valuable feature to Sortapp. For example; Neighbors in a housing cooperative may have a basement storage where they store belongings they use occasionally and would therefore like to share these items with their neighbors. If a neighbor wishes to check if an impact drill has been stored by another neighbor in the communal basement, they can access this information by searching for the housing cooperatives storage in Sortapp rather than searching for the item elsewhere. This solution generates easy access to shared items in a user's nearby area. The concept is presented in figure 43 and has been refined in comparison to figure 42 above. Accessing the shared storages when pressing the icon illustrating two people, as this was recognized as a sharing feature. The shared interface is divided in two titles, much like the separation of Single and Multiple items in the concept of adding items and sharing. The first switch title, Shared, represents a list of storages/boxes/items other users share with you. The second title, Contacts, represents a list of Sortapp contacts. A search bar was also added in Contacts to be able to quickly search for a specific contact, to access their shared belongings.

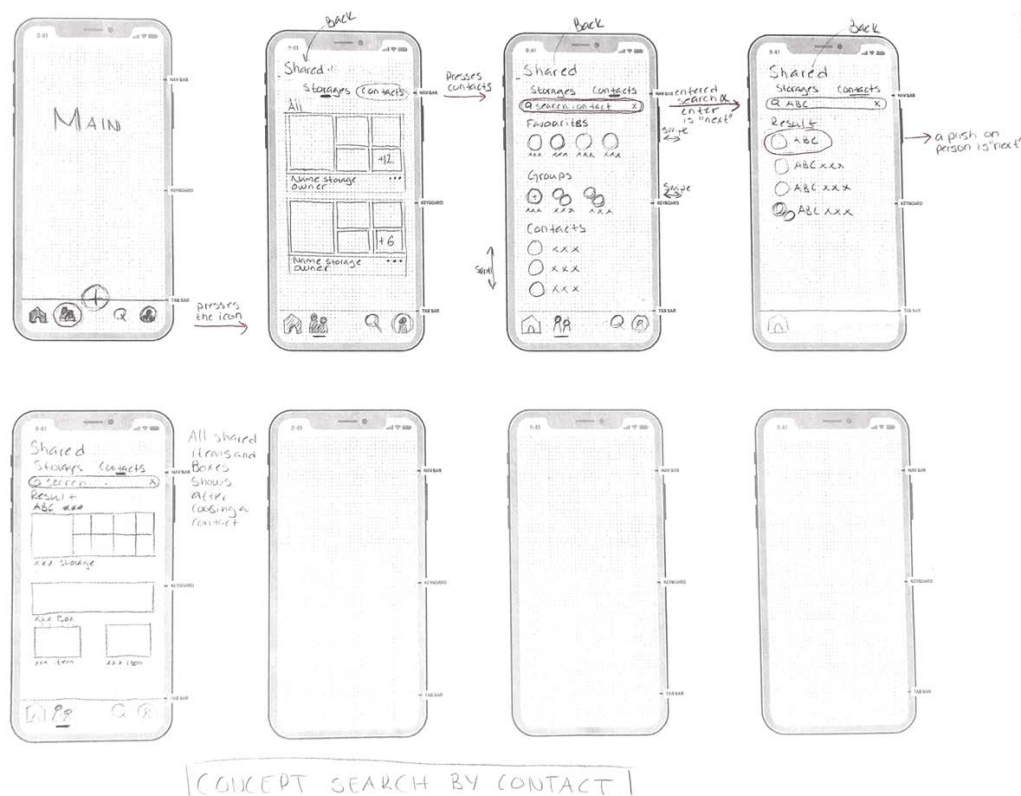


Figure 43. Handmade sketch of the final refined sketch of the last parts of how to search for a contact shared items/boxes/storages with you, part 1-5.

Notification center

The last conceptual idea concerns the notification center, shown in figure 44 and figure 45 below. The notification center was not an issue that originated from the user test of Sortapp v.1.0 or from the analysis of the Journey map. It was instead an outcome of positive feedback on required information given to the user when completing various task in the app. It was discussed during meetings with Sortapp as an interesting feature to add. Therefore, two solutions were designed to facilitate the flow of information.

In figure 44 the conceptual idea to add a tab on the main page are shown, under the header consisting of two titles to switch from, same as seen in other concepts presented. The title Main represents the home page, a list of the users' own storages/boxes/items to access. The second title, News, is where the user can find all the information and notifications received regarding storages/boxes/items and shared belongings. The negative factor of this concept was that the clean main page could give somewhat of a messier impression when adding titles, shown in wireframe 1 and 2 in figure 44 below.

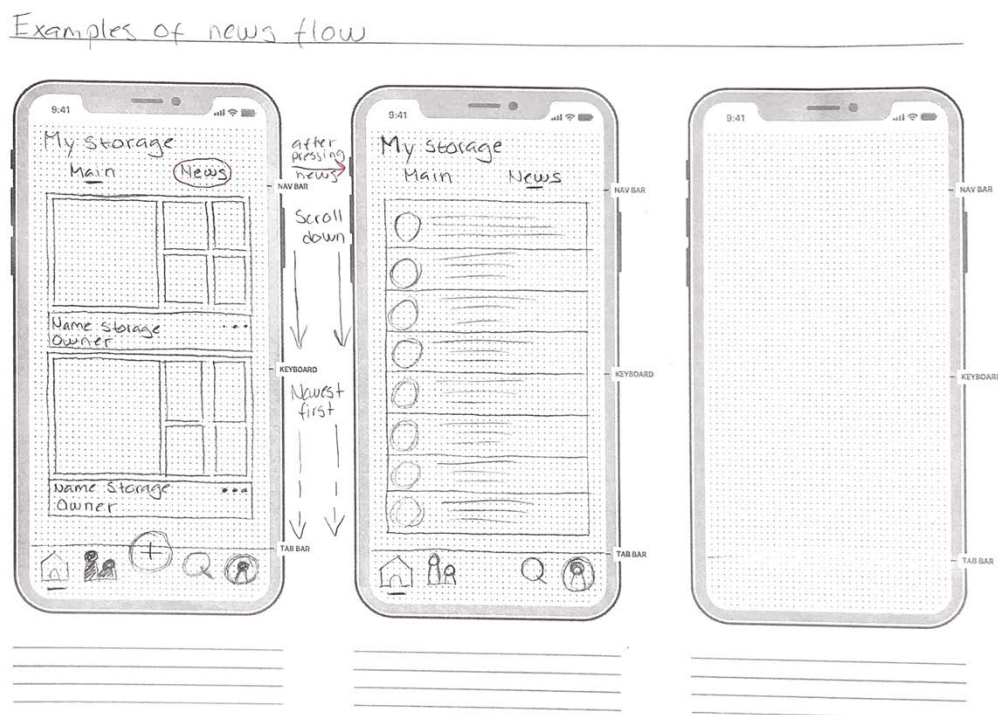


Figure 44. Handmade sketch of the final refined sketch of concept one of the notification center.

The second concept of the notification center, shown in figure 45, is placed in the profile feature where a settings feature can be found in the existing app v.1.0. The concept has an advantage of the possibility to add the classic red notification circle

that can be seen in many other applications and communication tools. The added red circle alerts the user that something new has happened and the information is accessed in the profile feature. The profile was then divided in the profile information/setting at the top of the page and a notification list was placed beneath. The settings icon (the gear) was added to the top of the page, as it was well recognized to contain settings.

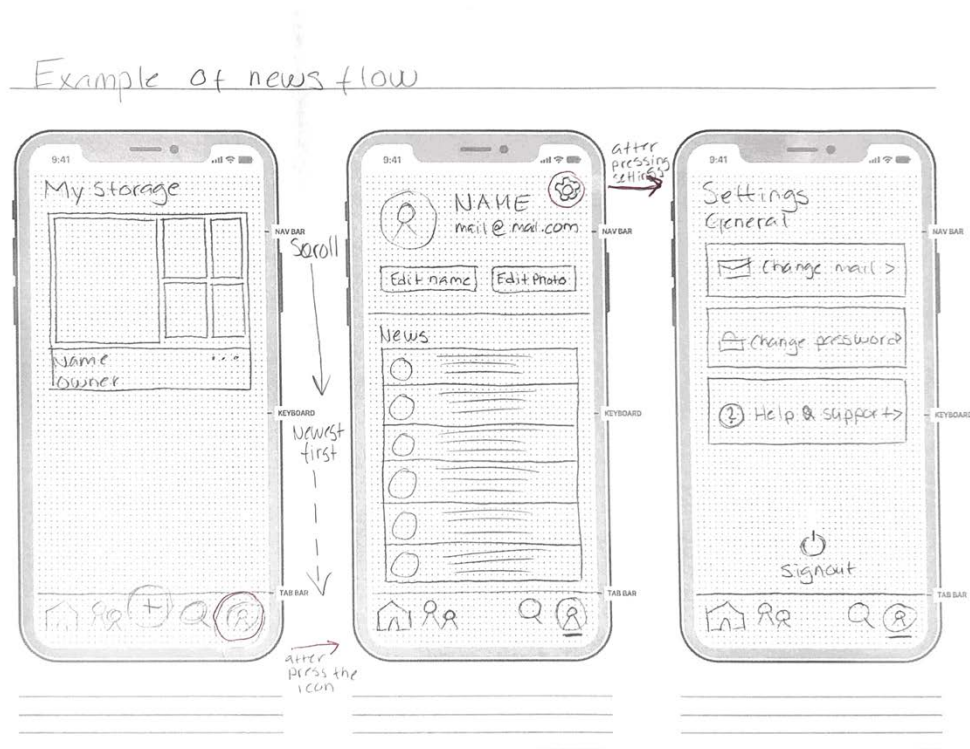


Figure 45. Handmade sketch of the final refined sketch of concept two of the notification center.

During the meeting with the mentors from Chalmers and Sortapp, the evaluation led to new add ons to the conceptual designs. New improved app designs and prototypes from Sortapps was given to the project to keep the main design theme throughout the application. A discussion about the tab bar in the footer gave knowledge on how much it will be used in the different features and interfaces. Also, the buttons next, back and cancel needed to be added and removed from some wireframes. The meetings were helpful, and the evaluation of the concepts above led to some improvements to work on during the prototyping in Sketch/Adobe XD.

5.2.3 Conceptual prototypes

The conceptual sketches and wireframes presented in the previous chapter were further refined in Adobe XD. This was completed to be able to evaluate and test the concepts to achieve a final result to present. Each conceptual feature was re-evaluated

and some changes and additional parts to the concept were added to facilitate each task and feature.

The first conceptual feature, **adding a single item** and sharing, did not result in many changes when refined in Adobe XD. The prototype was simply refined by adding color and interactive elements to be able to test in the next phase of the project. Figure 46 represents an image of the interface the user enters when adding an item as a single unit. Coloring the title Single with a green vibrant color indicates that the feature is active. This was thought to guide the users in their process of adding an item and sharing, and to facilitate this activity as it was seen as a pain in the journey map found in chapter 4.2.4. When the icons in the bar beneath the image are pressed and activated this same indication is applied by turning the icons green. This also applies to miniature pictures displaying the item. The green color is the same as Sortapp uses in their v.1.0 which originates from their chosen design language.

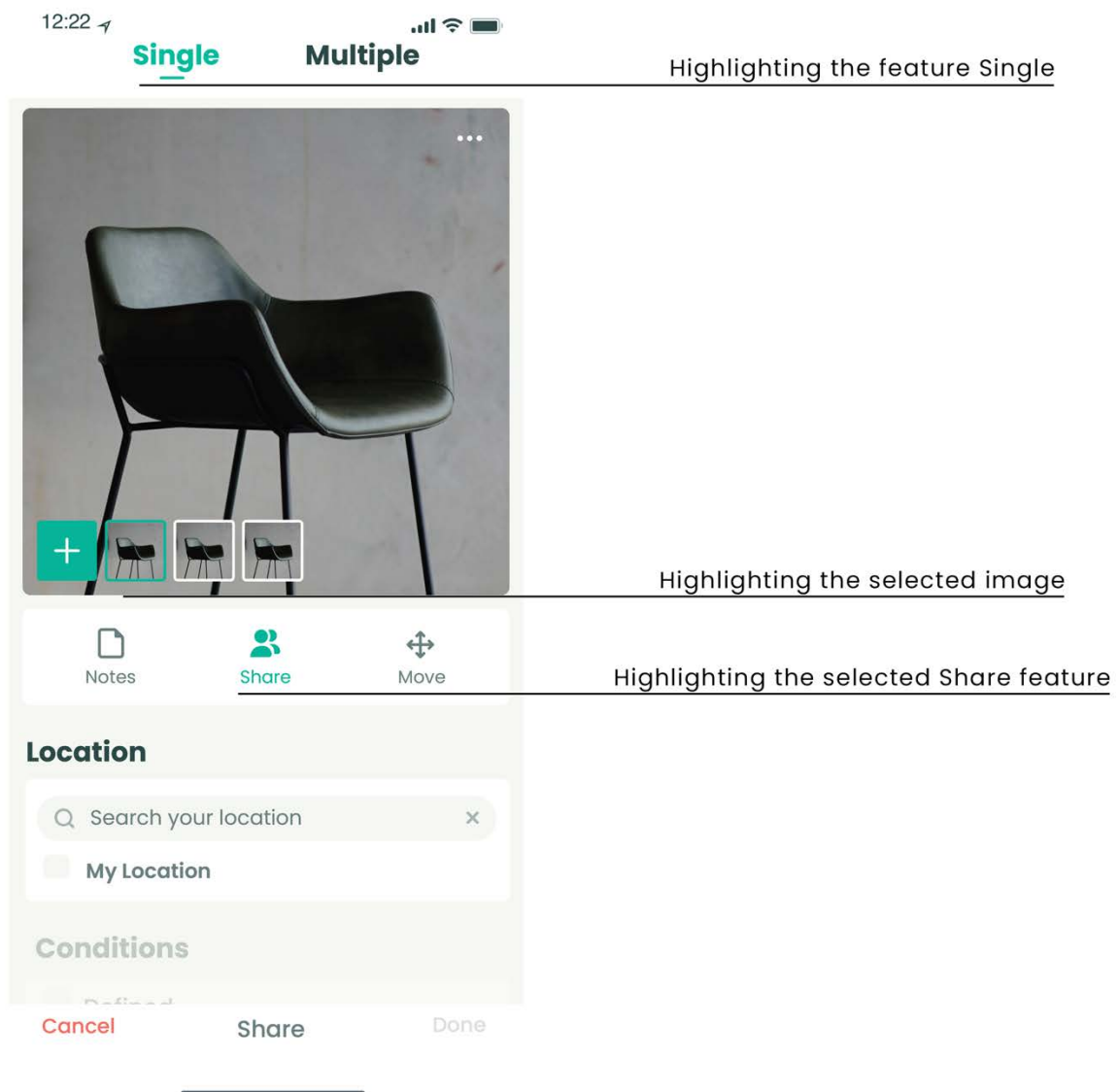


Figure 46. Prototype page of concept adding an item and sharing.

When dividing a single item to multiple items a new interface is presented to the user, see figure 47. Here the title Multiple is colored green to indicate the switch from a single item to multiple items. An additional delete icon was designed to this concept when prototyped as it was discussed as important when editing. Highlighting the active features were found to be important in this phase of the concept evaluation. All the highlights are thought to guide users and create an intuitive app. It was therefore also added to the images when selected, to intensify the indication of what the user has accomplished so far.

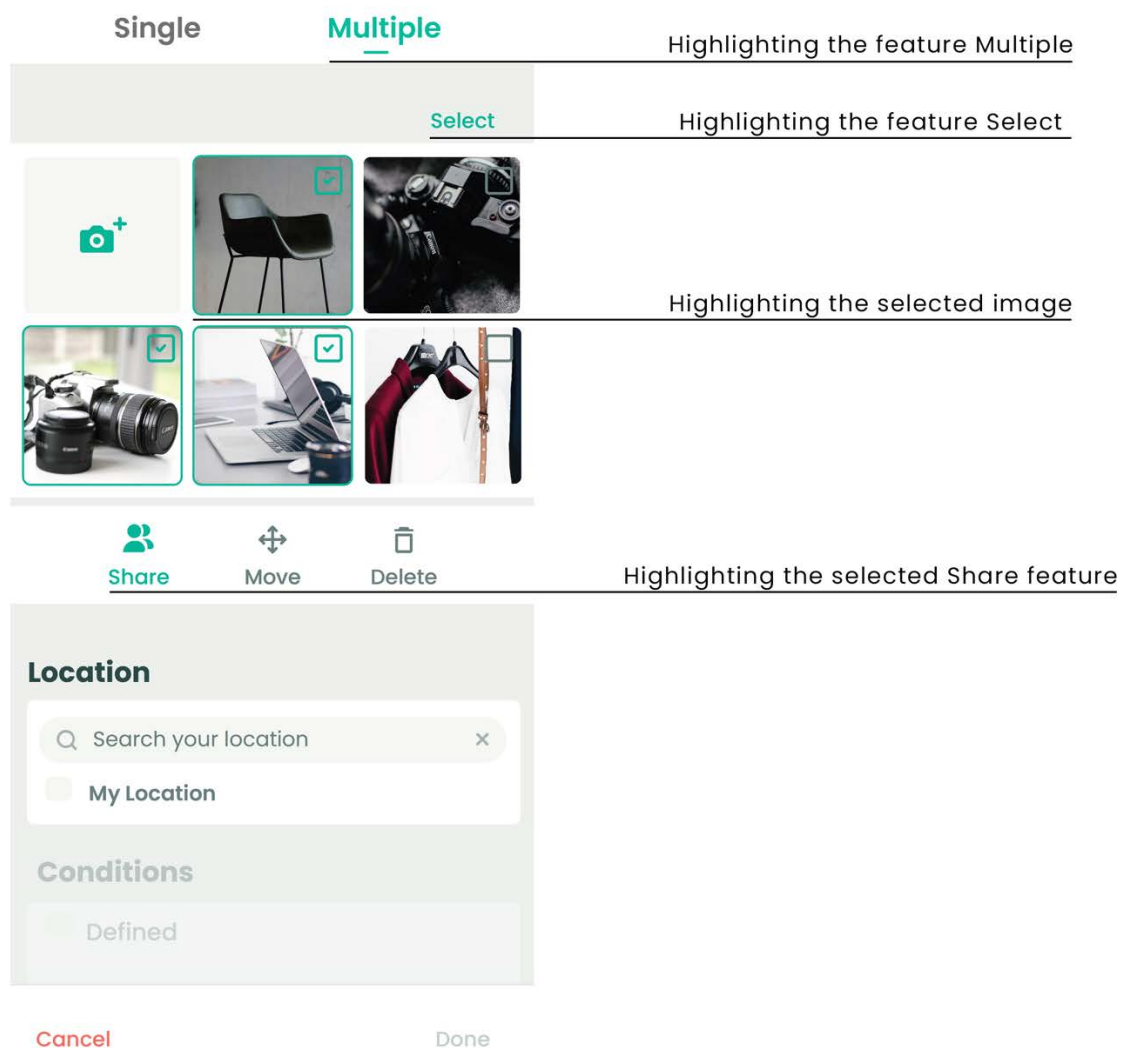


Figure 47. Prototype page of the concept adding multiple items and sharing.

In addition to the small changes to the conceptual features **adding an item/items** and **sharing** an idea of how to nudge people to share more was discussed. To guide users to find this feature of sharing items when adding them to Sortapp a message was designed to appear when users have added items without sharing, see figure 48. This message is shown when a user wants to complete the task of adding an item and has

not selected that they want to share it with friends and family. This way users that are not acquainted with the share feature are introduced to it. For the users that normally do not share their belongings it works as a reminder that sharing is easily accomplished therefore encourages them to do so.

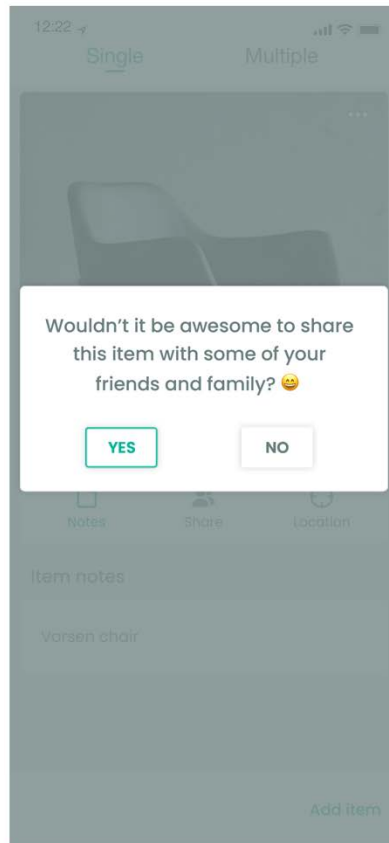


Figure 48. Prototype page of message on nudging users to share added items.

The third conceptual feature, **search for an item to borrow**, was thoroughly refined and design decisions were made when prototyping. Firstly, the choice of distance was chosen to be presented as buttons representing specific distances in kilometers to facilitate the selection, seen in figure 49. A second decision made in this phase was which of the alternative results designs to prototype and test. Therefore, the map view in this concept is chosen to be presented as in figure 50, a map and a list of items beneath it to scroll through for browsing. This alternative was seen as most similar and cohesive with Sortapps overall design. The solution chosen for the list view is presented in figure 51 and displays the items in a view inspired by shopping apps and websites to give a familiar interface to the feature.

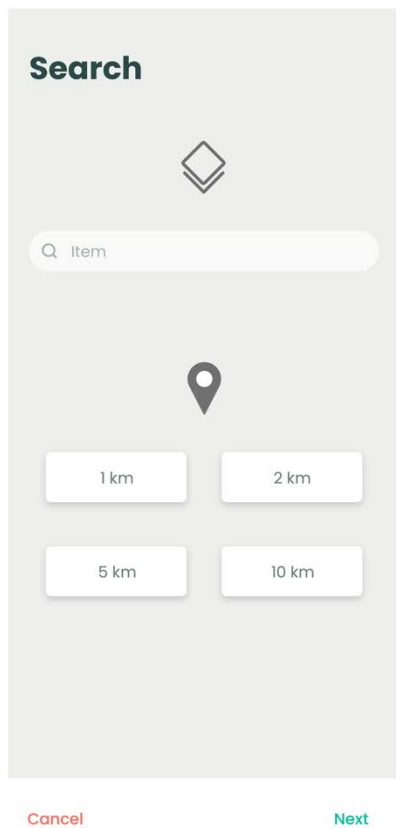


Figure 49. Prototype page of the first search interface.

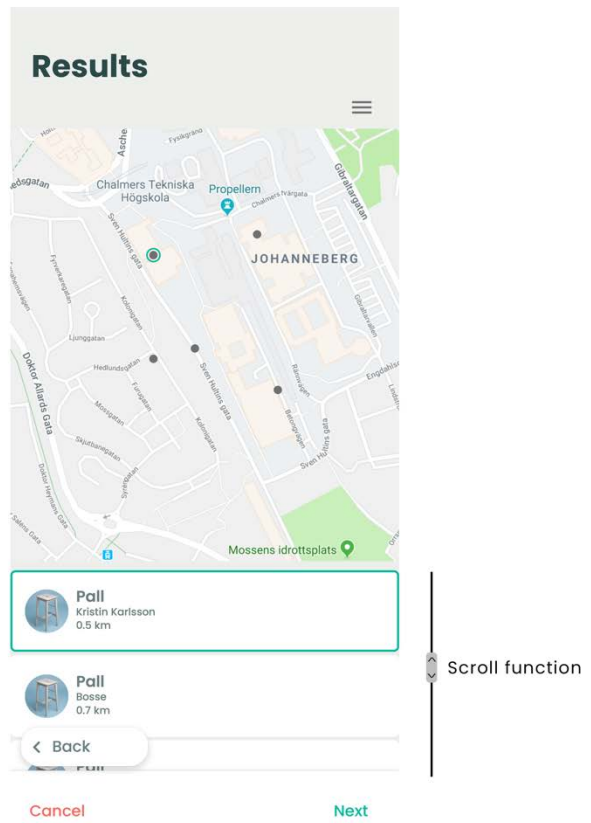


Figure 50. Prototype page of the results map view

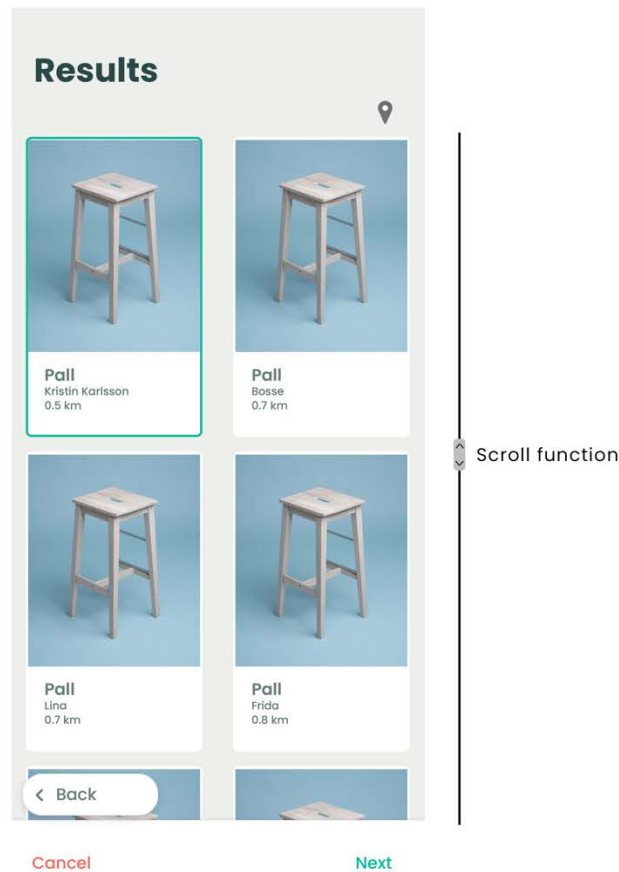


Figure 51. Prototype page of the results list view.

The conceptual feature **searching by contact** to see what they have chosen to share with you, also has a similar design to the wireframe sketches presented in the previous chapter 5.2.2. The list of contacts was further explored and discussed when prototyped. It resulted in a simple list display with favorites presented at the top followed by other contacts, see figure 52.

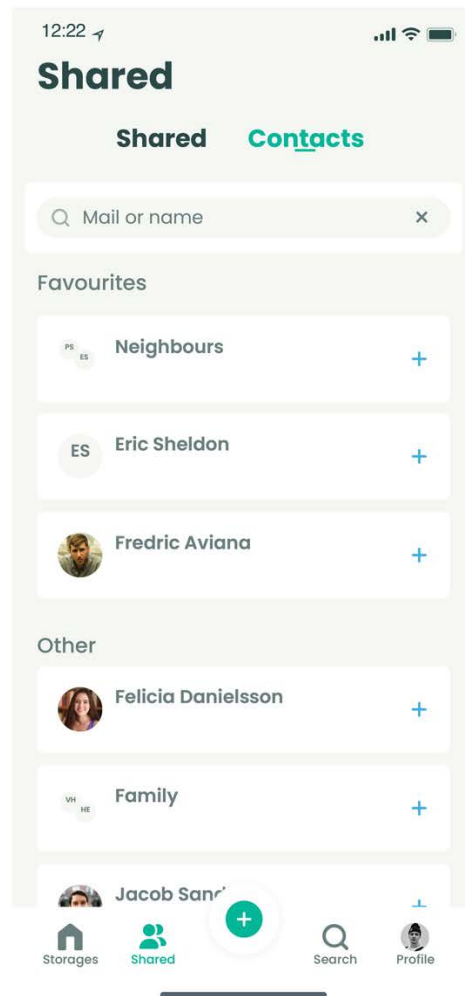


Figure 52. Prototype page of the presented contacts.

The two alternatives to showcase a notification center were both prototyped as it was discussed that both alternatives needed to be tested to be evaluated. During the prototyping the importance of highlighting the newest notifications was discussed, to clarify for the users what the unseen notifications are. Figure 53 presents the first solution of placing the notification center on the main page and accessed by pressing the title News. In figure 54 the notification center has been placed in the profile feature as discussed in chapter 5.2.2.

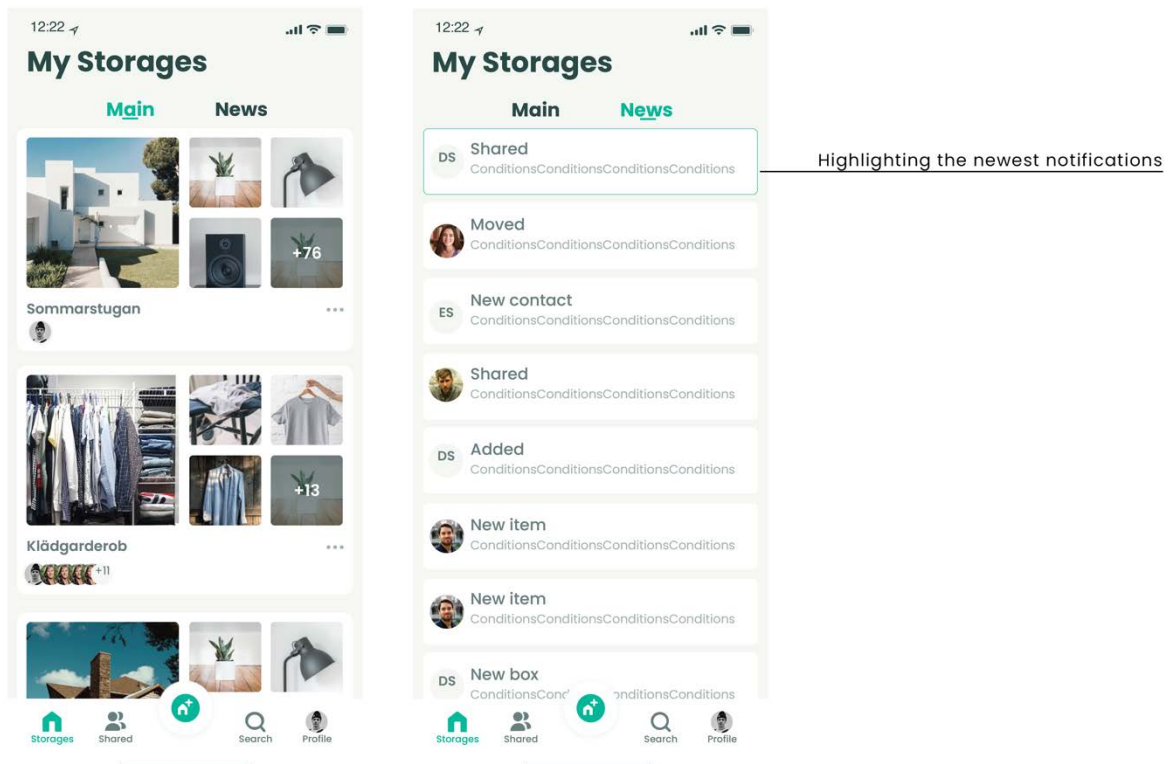


Figure 53. Prototype of notification center placed on the main page.

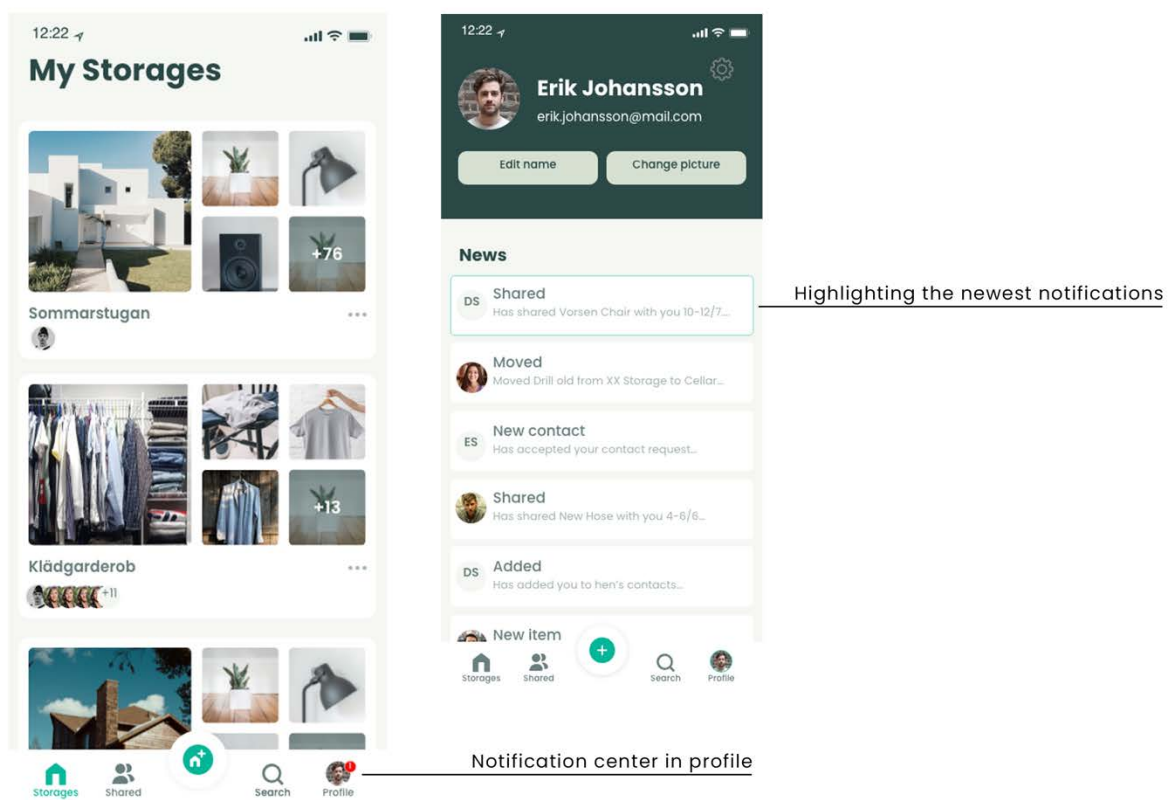


Figure 54. Prototype page of notification center placed in the profile feature.

5.2.4 Prototype evaluation

The prototype testing involved five tasks to evaluate the developed conceptual features presented in chapter 5.2.2 and chapter 5.2.3. The results for each test subject were very similar regarding the five tasks. By grouping the analyzed outcome by cause of tasks, the important and recurring difficulties could be identified. All comments from the analysis and the tests are shown in appendix XII.

Search for an item to borrow

The overall opinion of the Search feature was that it was intuitive and resembled other existing solutions. The concept brought a recognition element that many test subjects have expressed, throughout this project, as positive when interacting with new apps. Apart from the positive feedback a few struggles did arise when completing the task of sending the request to borrow. Many test subjects did not realize that they were required to check the Conditions box to be able to move on to the next step. Other digital agreements, terms and conditions are most often the last element to accept, placed below everything else. The placement of it at the top of the screen might therefore have confused the subjects. They went on to select dates before accepting or reading the conditions that apply to the item, determined by the owner.

Add multiple items and share

The second task was a little more demanding. Many subjects identified the switch from Single to Multiple, however not all realized what they had accomplished a separation of the items by switching. Once they analyzed and examined the Multiple interface, they understood that they had divided the pictures to separate items. The next step was to select several items to share, which was shown to be the most demanding challenge the subject encountered during the tests. They tried to press the images to select them, this however would direct them to the feature Edit item. In this feature the subjects were also able to complete the task of sharing the items one by one. Though the task was to select several items at once to share with friends and family. After pressing different sections of the interactive screen, they came across the Select button. When pressing Select the small check boxes made it intuitive to be able to continue the selection of the three items as described in the given task.

Thereafter the following steps to complete the sharing of the items showed no further struggles. The icon was easy for all the test subjects to find, as they all associate it with a group of people and a community. When the steps of sharing the items with friends and family were completed the indication that it had been accomplished by having a notification appear on the main page was well received and valued.

Add single item and share

To share a single item when adding to the app showed no additional struggles in comparison to adding several items, described above. The first step of the task, adding an item, is easily found by all subjects. The large (+) icon in the footer is distinctive and intuitive according to the subjects.

The following steps of sharing the item required similar interaction as in the previous task of sharing multiple items, a recognizable sharing icon and logical steps to follow. The condition option Other that could be interacted with in this task showed a small confusion. When the box is checked it creates the feeling of accomplishment, that no other requirement is needed, much like the other check boxes throughout the app. However, the user is asked to fill in their own written conditions to apply to the item. This is achieved by pressing the bar with an arrow, that implies that a keyboard will appear for the user to type in what they would like. Therefore, that option demands two activities, check the box and press the bar to type in a condition. Unlike the other three options, where the only requirement was to check the box to choose a condition.

Search by contact

The fourth task the subjects were given, was to search for a contact to see what the contact has chosen to share with them. The difficulty in this task was to find the feature, thus most subjects firstly went to the Search icon, the loop, as this implies some kind of search function. When they realized that finding contacts was not there, many tried pressing different icons simply to see what feature lies behind them. This showed that the share icon found on the main page in the footer was not intuitive enough, that the subjects did not associate the icon and the text Shared with contacts and friends on the app. Once they found the contact list in the Shared feature, they understood how to interact with it. However, some participants had trouble understanding what the results where. This was due to their way of interpreting the task as some understood it as only searching for a contact.

Notification center

During the fifth and final task the participants were asked to find where a notification center was placed inside the app. They were presented with two different option, presented in chapter 5.2.3, and were asked to choose which they prefer and why. The first solution was placing the notifications in the user profile and when the user has received a new notification a red circle with a number appears on the users' profile picture in the footer. However, that indication was difficult for many participants to see, mostly due to the size of the screen. The participants also explained that they usually do not associate one's profile with a notification center. They would expect a user setting feature, which is still present in the profile, though it is implemented in

the gearwheel icon. The new placement of the settings showed no struggles in finding; thus, that icon is well known.

The second solution was to place a notification center on the main page. That was designed by having two titles, Main and News, on the main page where the storages are listed. Many participants found it much easier to find the News title. However, they did not associate the word News with notifications. They expected news that were in regard to the app, what the latest news Sortapp had to offer etc. The easiness of finding the feed might had to do with the size of the screen as it showed that the one test subject, using the big screen saw both examples just as easy. This concept needs further evaluation and tests as it was an additional feature idea and not a part of the project scope.

Feedback Sortapp

When the conceptual features and prototypes were presented to the company Sortapp and the developers, the concept received some feedback. The concept was presented in a meeting room where six people participated; two UX-designers, the founder of the app, one graphical designer, one programmer and the project/market leader. The overall assessment was that the general idea of the concepts was well compatible with the app as it is designed today. Also, that the concepts add to the aim of being a sustainable tool, by promoting a sharing economy and society. Small comments on the overall design and UI elements were given. However, these were parts that the project did not develop and analyze further as they were not part of the project scope.

5.2.5 Conclusion Phase 3- Concepts

To conclude the third phase of the project, it showed how important the initial tests from phase 1 in chapter 3 were. The initial tests gave insights on how to think regarding the interaction and design to facilitate for the users when using an app. The overlapping between the phases has been used to achieve reliable ideas as solutions during the conceptual designing.

The results obtained by analyzing the main issues from phase 2 presented in chapter 4.2.5 was used as a basis to create ideas around. The issues were turned into detailed problems and lastly translated into features which were ideated upon to solve the problems showed in chapter 5.1.1. The ideation worked fluently, and the ideas were quickly improved during the concept generation when using wireframes as a basis for the wireframe sketches. When transforming the wireframes to interactive prototypes in Adobe XD, the last improvements on the conceptual features were created and detailed, to be able to test the ideas on potential users.

When testing the five prototypes on potential users' further evaluation could be completed. All prototypes showed an overall good result. However, some minor design details showed a need of further development. These changes were mostly related to the information flow and structure of the different interfaces of the concepts. These details did in some activities hinder the participants to fully understand the features and their full potential. However, the goal of each concept was to improve and facilitate the different activities found in the journey map chapter 4.2.4 and was seen as overall accomplished. Further prototype tests and evaluations of the concepts need to be completed as it was seen that the low-fidelity interactive prototypes could not test all interactive elements of the conceptual features. It is therefore seen that a higher-fidelity level of the prototypes need to be developed to be able to fully test the intuitivism of the concepts.

06.

Final Concept

This final chapter presents the thesis results in a final conceptual prototype as a proposal to improve the app Sortapp by adding sharing features.

6.1 Designed features

The final concepts, including small changes added after the results of the prototype testing, is presented below. The concepts were created in Adobe XD and illustrate the four activities that were shown to be the most crucial and demanding to complete when sharing items with others.

Adding an item & sharing

Adding a new item and sharing was the first demanding task of the sharing process to improve. A general step by step illustration of the task is presented in figure 55.

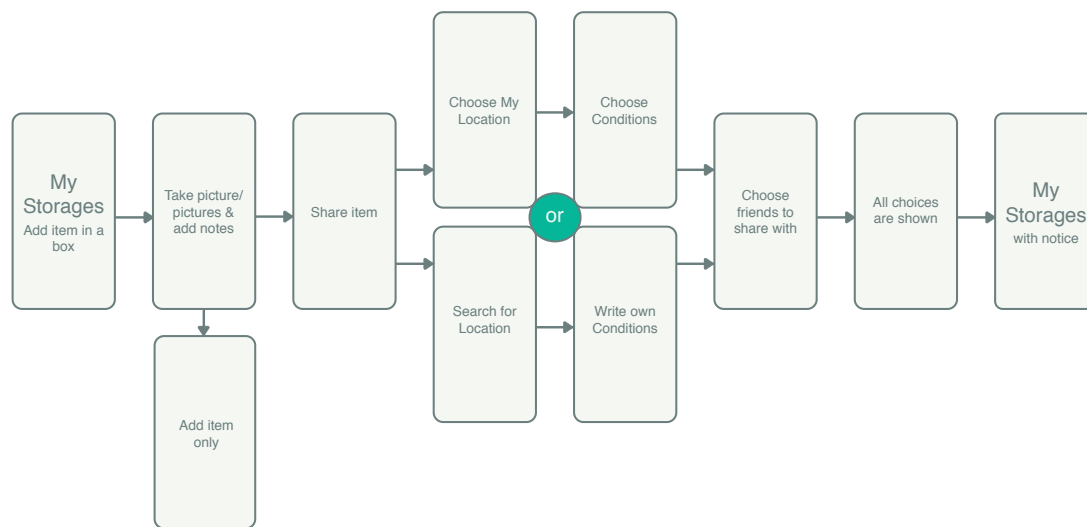


Figure 55. Illustration of the task Adding an item & sharing.

The first steps of adding an item is similar to how Sortapp version 1.0 is developed, see figure 56. Hence, the process is intuitive as the interface is recognizable and similar to other applications. The only added feature to the existing app is the possibility of checking if the taken picture is good by pressing the miniature pictures, beneath the large picture. The presentation of a picture is highlighted by a green frame showed in the third picture below. Furthermore, the process showed no obstacles during the tests in the initial user studies.

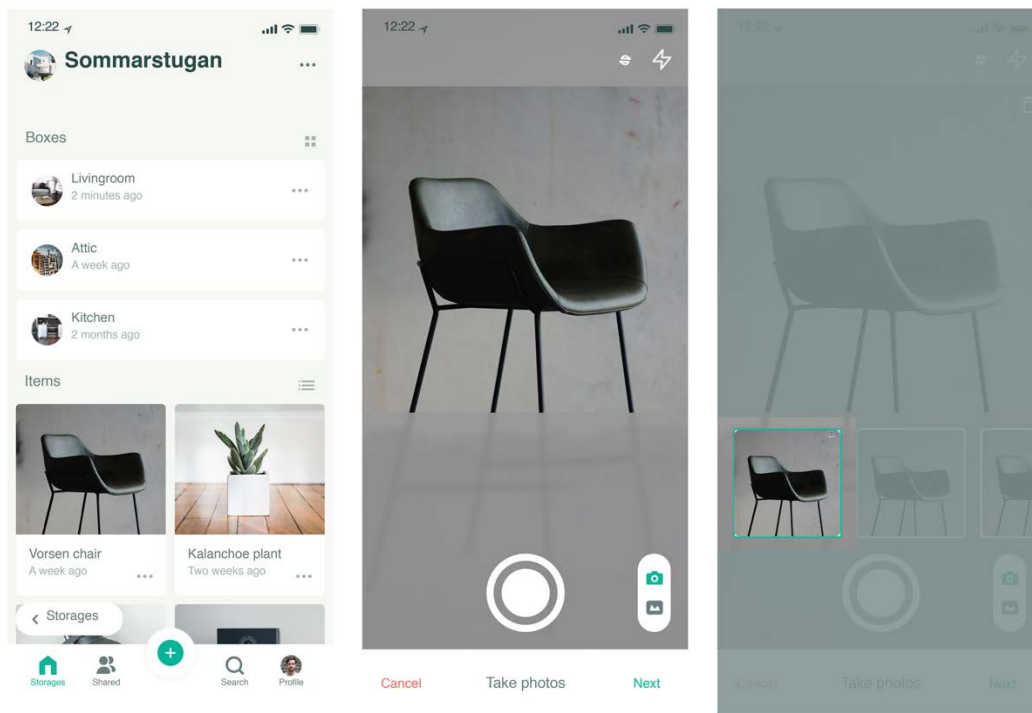


Figure 56. Images of prototypes - adding an item, taking photos and viewing the photos.

When the pictures of the item have been taken, the user enters a new view with a new interface. In this interface an icon symbolizing the feature Share is placed next to the feature Notes found in the bar beneath the taken photos of the item that the user is adding to Sortapp. This placement was chosen as the bar was seen as an interactive element. The bar element works as an additional information panel to the images taken of the item. Starting with the primary feature and function of adding notes to an item such as a name, size, condition etc. The next choice a user encounters is sharing the item with friends or family. Placing the sharing icon next to a primary feature, such as notes, enhances the importance of this feature. This can therefore nudge people to share more of their belongings with others. The icon is equal to the one Sortapp is using when illustrating the task of sharing, see figure 57.

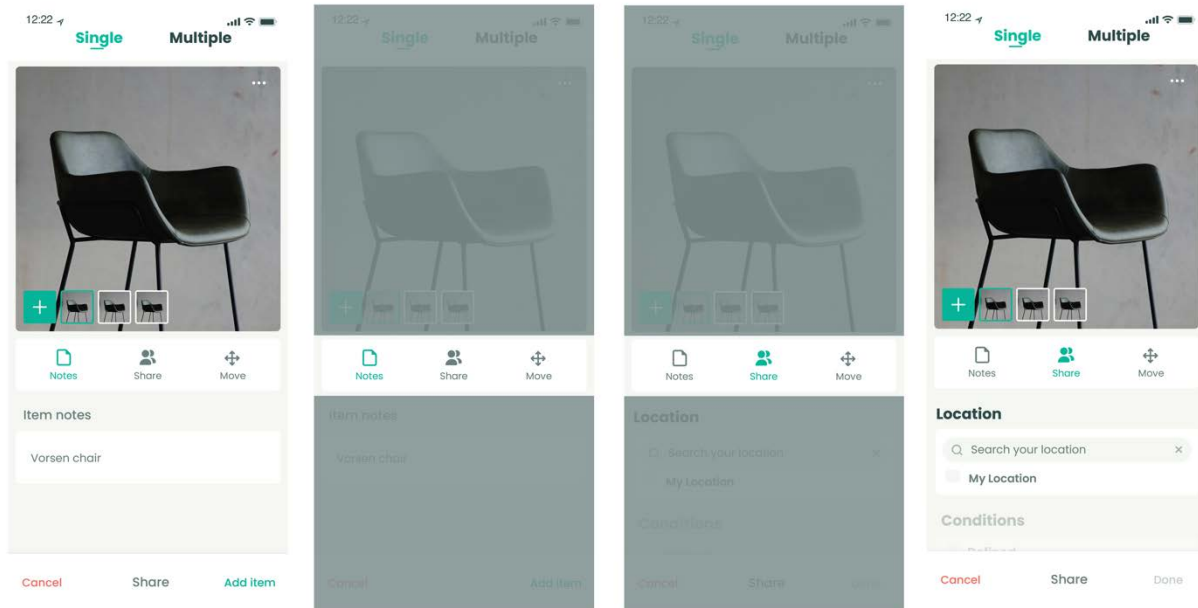


Figure 57. Images of prototypes - Next view and interface when adding an item, with a sharing feature.

When users share an item, three elements regarding the item have to be determined. The first is a location for where the item is stored, an address where the item can be found. The user can either choose the option "My Location" which refers to the location/address they are at when adding the item in Sortapp, see figure 58. The other option is to write an address in the search bar where the app helps to determine an existing address, see figure 59.

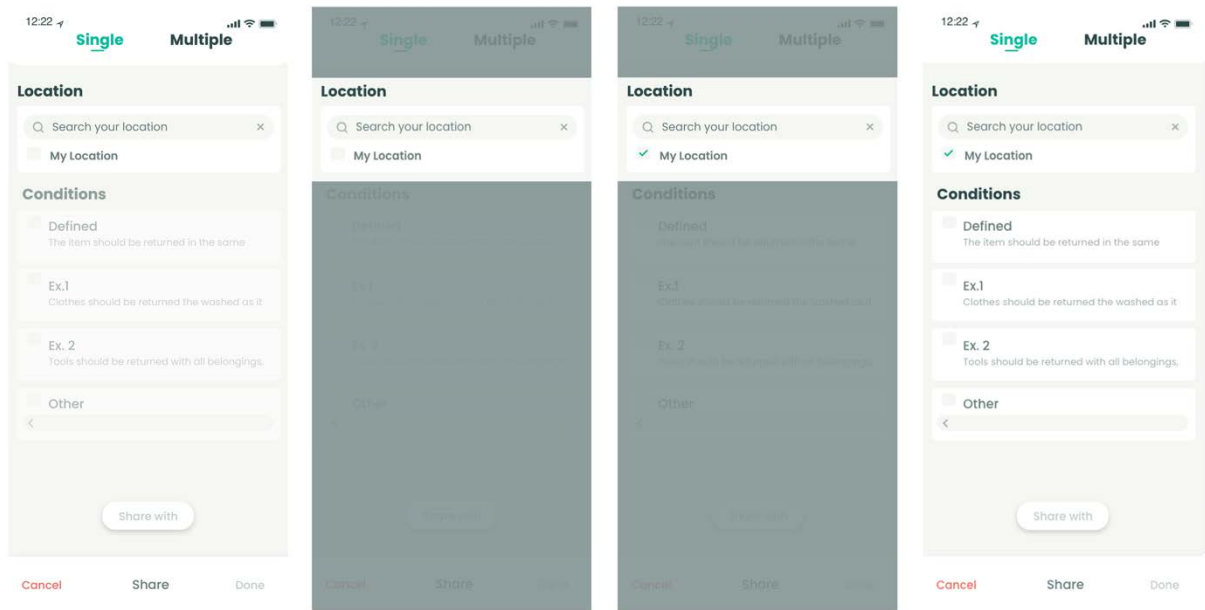


Figure 58. Image of prototypes - Interaction with the Share feature and choosing My Location, the address that you are at when adding the item.

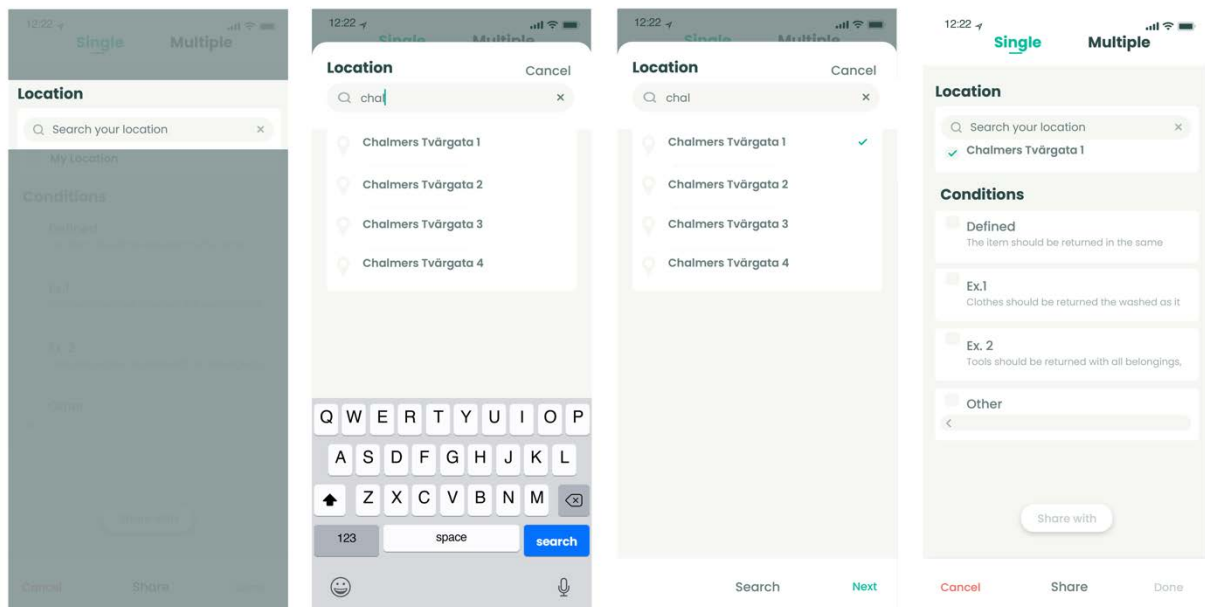


Figure 59. Images of prototypes - Option of typing an address in the search bar.

The next element is choosing what terms and conditions apply to the item when borrowed, see figure 60. The concept offers four alternatives to choose from. The first being a basic default condition, "This item needs to be brought back in the same condition as it was when picked up". Thereafter having two conditions that concern special types of items, such as clothes or tools. These types of conditions will however require a more thorough exploration and collecting of data on what items and products are mostly shared through Sortapp. The last condition is an alternative for the user to type a condition of their own, offering an option to determine exactly what terms the user would like to apply to their item. The last condition was shown in the test to be confusing and therefore a minor change has been added to the design. To enhance the implied task of writing your own condition a keyboard appears when the user checks the box related to the Other condition option immediately. To display what the user is typing the message box is in largened.

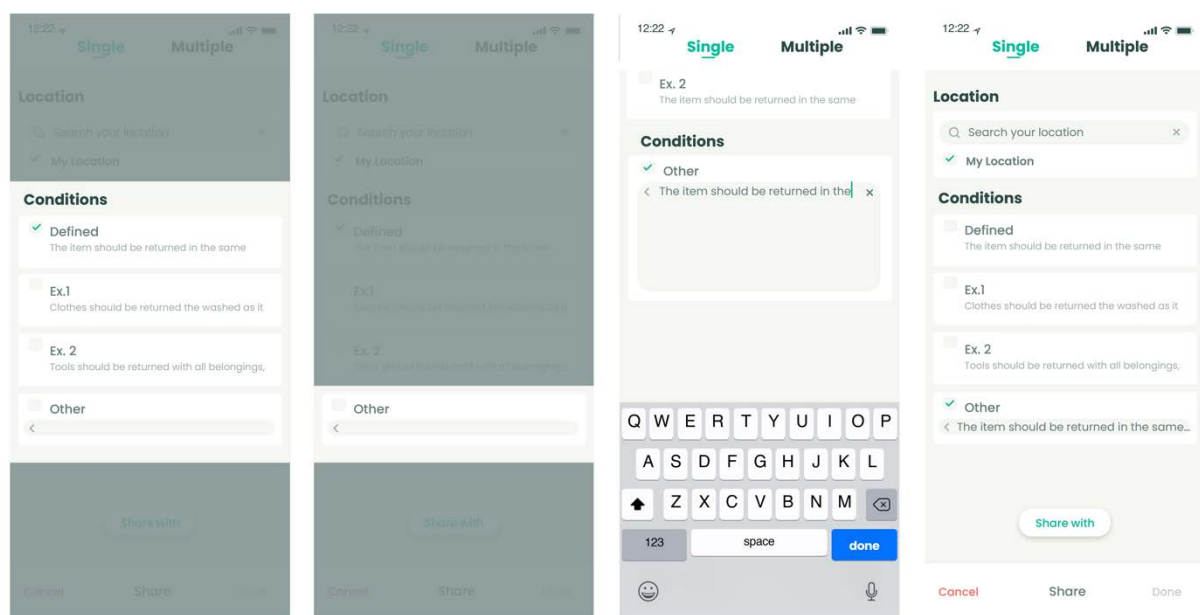


Figure 60. Image of prototype - choosing from a selection of condition to apply the item.

In the last step to the feature; sharing an item, the user has to choose with whom, see figure 61. Users have the option to choose as many of their contacts as they want, by scrolling in the contact list, searching for a friend or invite a new friend by email. To highlight the function of adding and also to display that the contact bars are interactive a small, plus is placed to the right in the bar. A plus sign is recognized as an addition symbol and was therefore thought to be an intuitive solution to the task

of adding contacts. To indicate a user's choices a small green check appears in the contact bar replacing the plus sign. A highlighted border contouring the contact bar is also added.

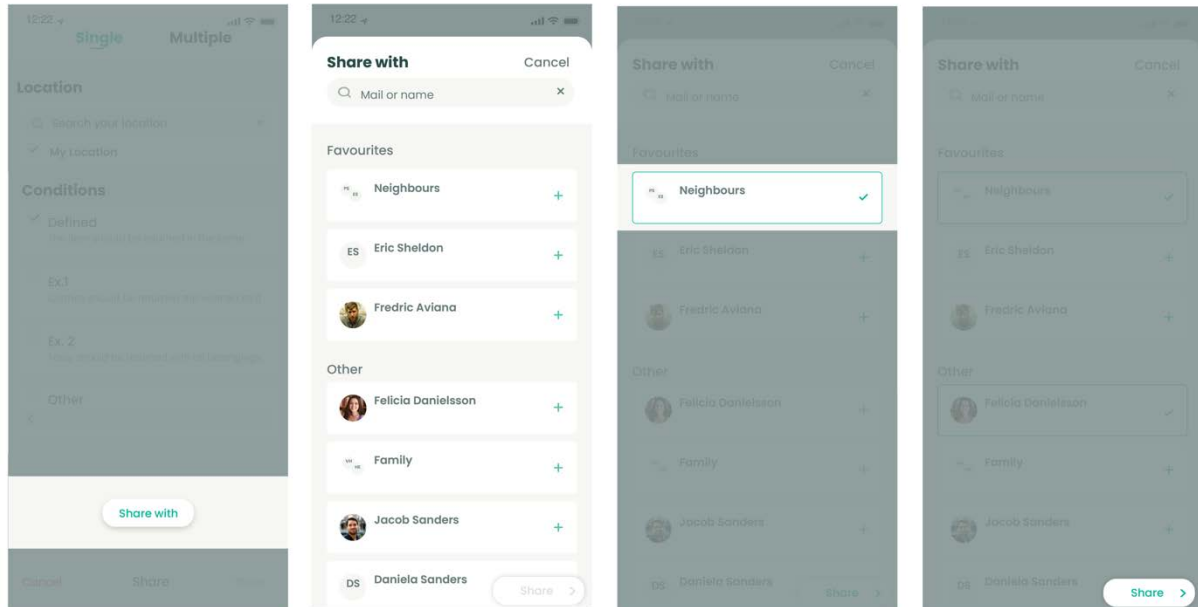


Figure 61. Image of prototypes - choosing from list of Sortapp friends and sharing.

Once the task of adding an item and sharing it with friends, family or other Sortapp users, the user is redirected back to the main page, with the list of all storages. Here a notification appears that confirms what the user has accomplished and completed, see figure 62. Informing the users on what has been accomplished after completing various tasks was identified as important throughout the initial user tests on Sortapp v.1.0 and during the prototype tests. This was seen as a reassurance of what the user was trying to accomplish, that the task has been performed in the app.

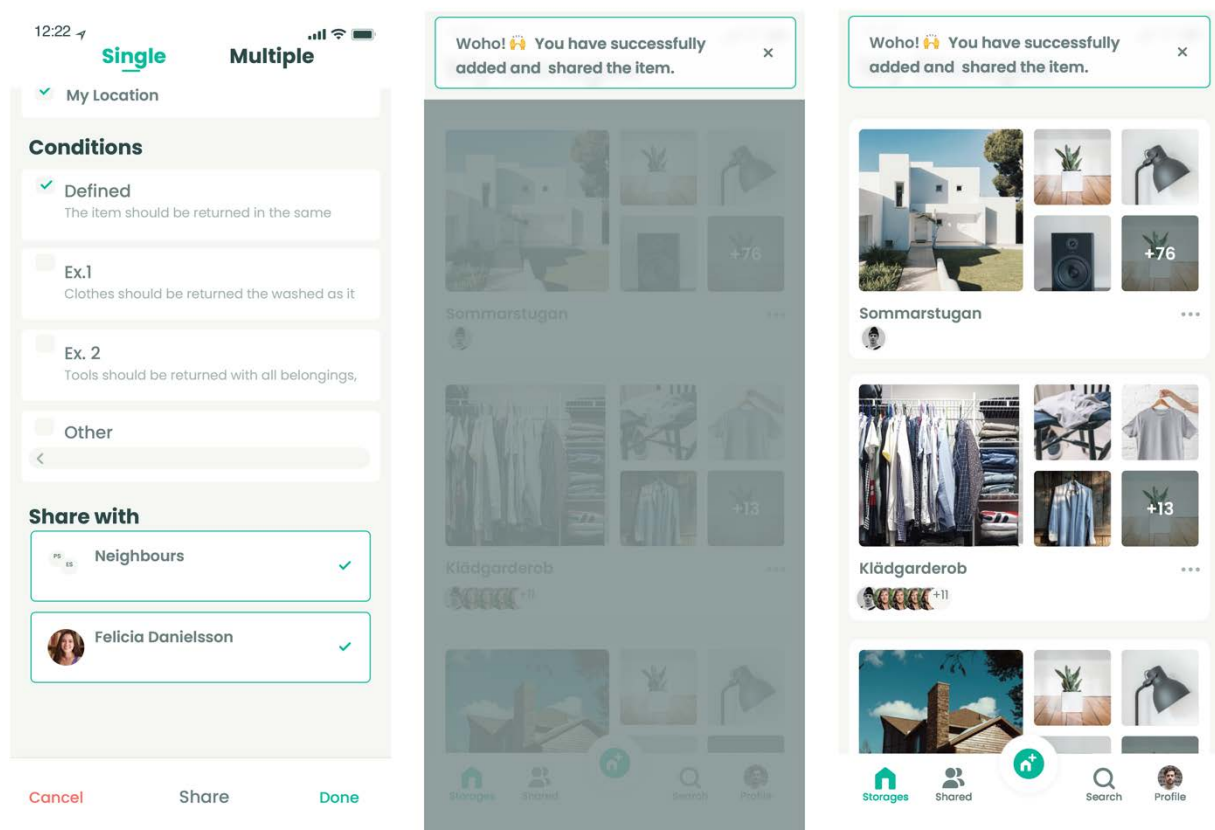


Figure 62. Image of prototypes - When user is done sharing and adds the item a notice will appear on the homepage to confirm that this has been completed.

Adding multiple items & sharing

The existing features and functions of Sortapp version 1.0 was taken in to consideration when creating concepts for a sharing feature. One important aspect of adding items in the app was to be able to decide whether the item is considered as one single item or if it is pictures of several items, that the user desires to add as multiple items. Therefore, an additional concept of adding multiple items has been designed and created to support the option of adding several items at once. An illustration of the task is presented in figure 63.

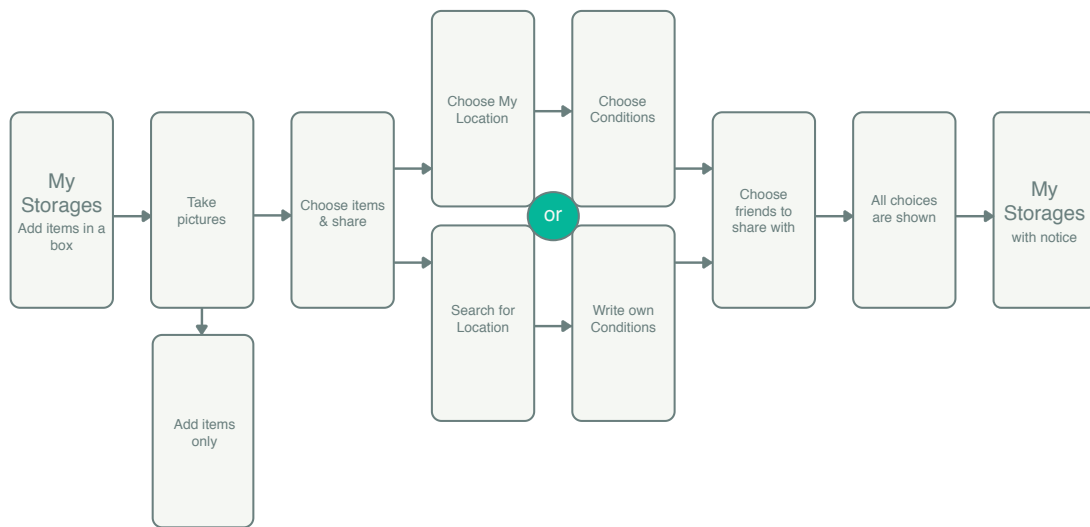


Figure 63. Illustration of the task Adding multiple items & sharing.

A solution of highlighting the words Single and Multiple at the top of the screen once the pictures have been taken by the user is shown figure 64. The idea of the switching from one title to another is an existing feature in Sortapp today, which was tested in the first phase of the project. The test subjects from the first tests showed that the switch feature was easy to interact with and was therefore thought to be a good solution for the dividing of single item to multiple items.

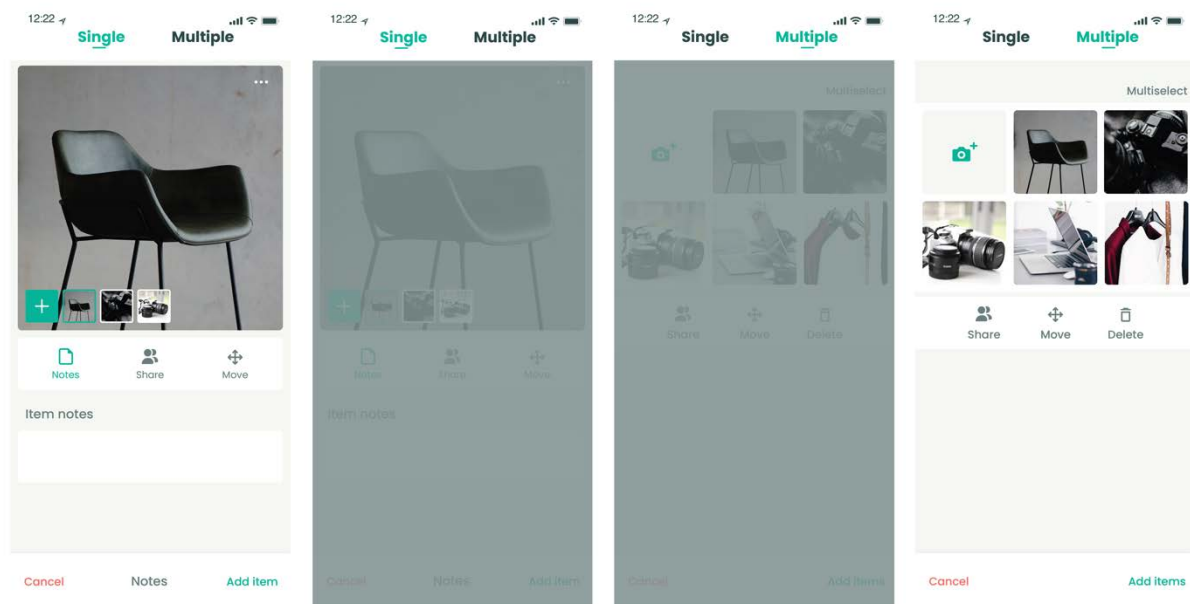


Figure 64. Image of prototypes - Switching from Single to Multiple.

The titles were added to help guide the users for the upcoming steps and choices to be made. Having the users read the titles and ask themselves "Have I taken pictures of a single item or do I want to separate and divide the pictures to multiple items?". The default in this stage is the automatic creation of a single item, highlighted in green. To separate the items the user will have to actively choose to press Multiple. When Multiple is chosen the interface changes, by dividing the pictures to singles displayed one by one and turning the title Multiple green, see figure 64.

In this interface the user has the option to choose one picture, one item, and is directed to the feature Edit item, see figure 65. The feature is similar to the Edit item-feature Sortapp has developed today. The edit function consists of three underlying features: Notes, Share, Move, see figure 65. Notes and Move are based on Sortapp's defined functions in version 1.0. Notes is an option that allows the user to write something about the item, giving a short description of the item. The Move feature is based on Sortapps Location feature, which displays the placement, in which storage the item can be found in the app.

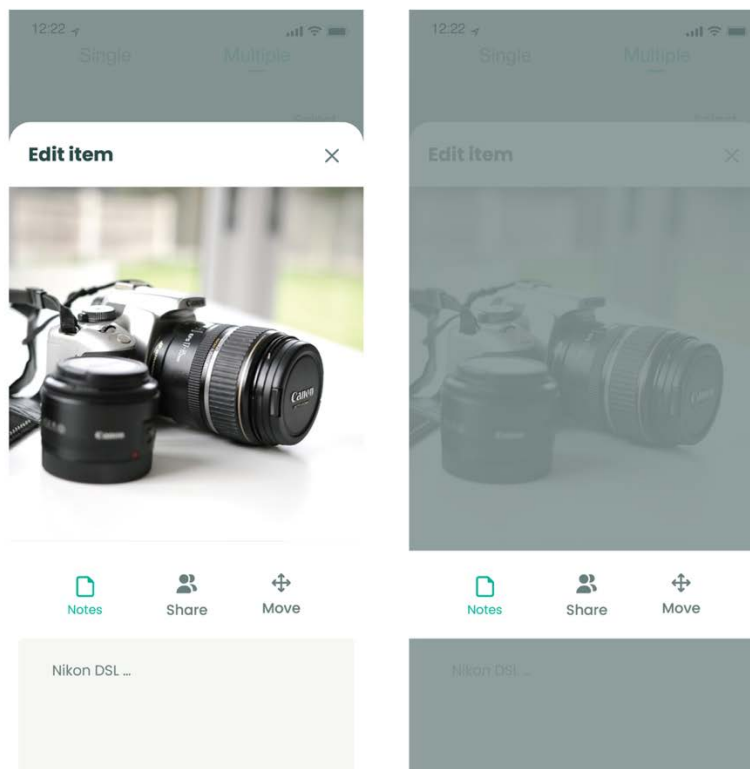


Figure 65. Image of prototype - Edit a single item as an item, by typing notes, sharing with others and moving the item to different storages in Sortapp.

An additional feature has been added to this interface, the share icon. The feature is identical to the one found in the interface of adding a single item. The user will have to make choices of where the item can be found, an address has to be determined. What conditions apply to the item and with whom the user would like to share the

item with. As shown in figure 66, the structure follows the previous concept description of adding one single item and sharing it. This was to keep the feature recognizable and intuitive, as it requires a few steps to complete the sharing.

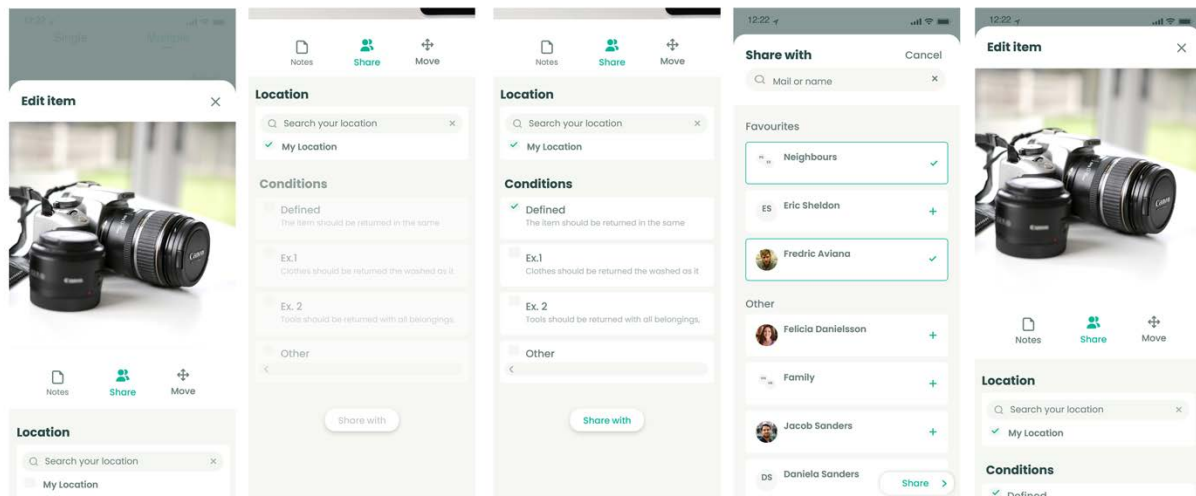


Figure 66. Image of prototypes - The sharing feature identical to the one found in previous concept of adding a Single item.

To share several items at once the user can select what items to share by choosing multiple items at once. This is done by pressing Multiselect placed above the pictures. This function was difficult to find according to the participants testing the prototype. The previous solution was Select and now a minor change of naming it Multiselect hopefully indicates the action more clearly. When Multiselect is activated small checkboxes appear on each picture, see figure 67 in the second prototype page. When the user selects an image the check box will be checked and the border of the image will be highlighted with a green color to indicate that the picture/item is chosen, see figure 67 in the third prototype page. This green color is consistent throughout the concepts and indicates an action of a choice the user has made. When the items are chosen the user can share the items by pressing the share icon and follow the next steps. The sharing feature in this interface, see figure 67 in the fourth and fifth prototype page, is equal to the Edit item option presented above as well as the sharing feature in the concept of adding a single item and sharing. The user shares the item by completing three steps; adding a location, applying a condition and choosing people to share with.

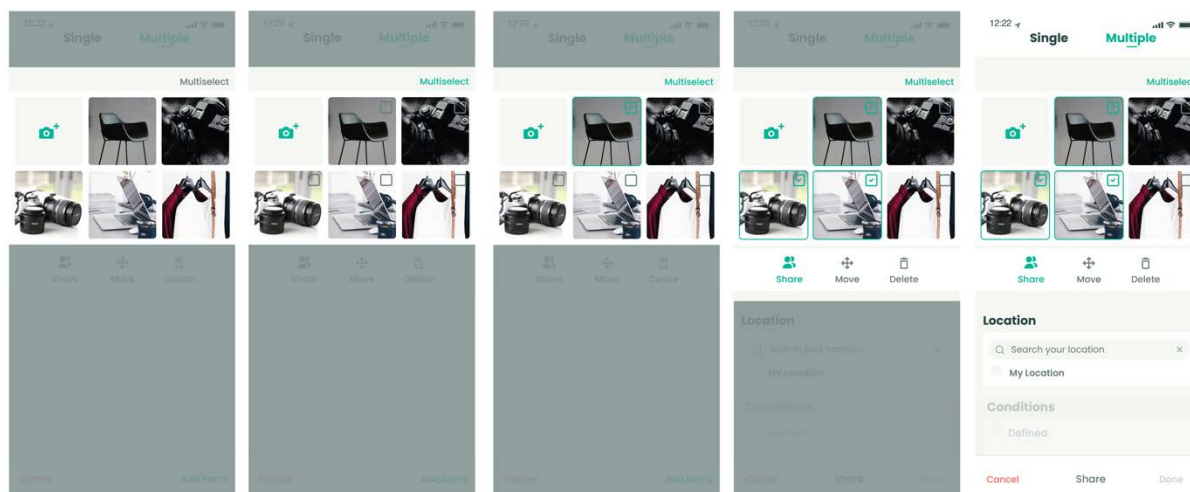


Figure 67. Image of prototypes - Selecting several images to share with others.

When the three sharing tasks have been completed the user presses Done and is redirected to the Multiple interface, see figure 68. This solution is added to the final concept due to discussions on the clearness and intuitivism of the concept were held when testing the prototype. The previous solution was that when a user has shared multiple items they were redirected to the main page where a notification appears informing the user that they have successfully shared their items. What if the user wanted to share more of their multiple items? Does the user fully understand that the other items that they did not choose to share still are added to their Sortapp storage? It is therefore thought that redirecting the user back to the Multiple interface generates an option of continuing the task of adding items and sharing if many items need to be shared with different contacts. To highlight that the user has chosen to share some of the items when redirected to the Multiple interface, small green share icons are placed in the right bottom corner of the item image, see figure 68. The icon appears when a user has actively completed the task of sharing. To finish the task of adding multiple items, when sharing is completed, the user presses the Add items button that implies to finish the task, see figure 68. When it is accomplished the user is redirected to the main page, indicating that the task is completed and to reinforce the accomplishment, a notification appears informing the user that the items are added and shared as in the concept sharing a single item. The small changes are thought to create a confirmation of what the users have achieved and will hopefully guide the users properly through the task of adding multiple items and sharing.

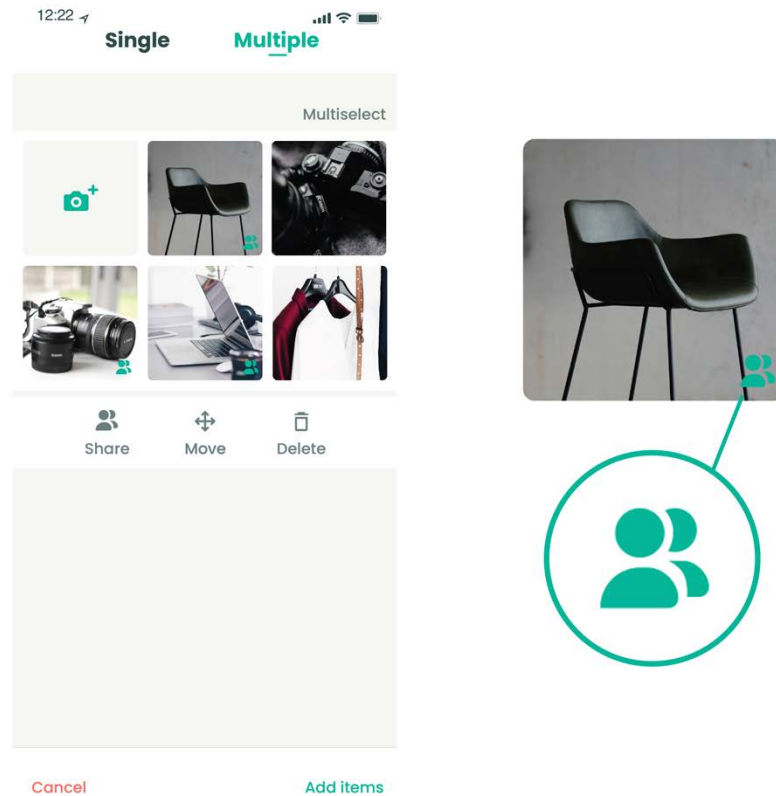


Figure 68. Image of prototypes – Redirected to Multiple interface.

Search for an item

Part of sharing one's belongings through Sortapp is also being able to borrow what others have to share. This concept regards the user that would like to borrow an item from another user. An illustration of the task, step by step, is presented in figure 69.

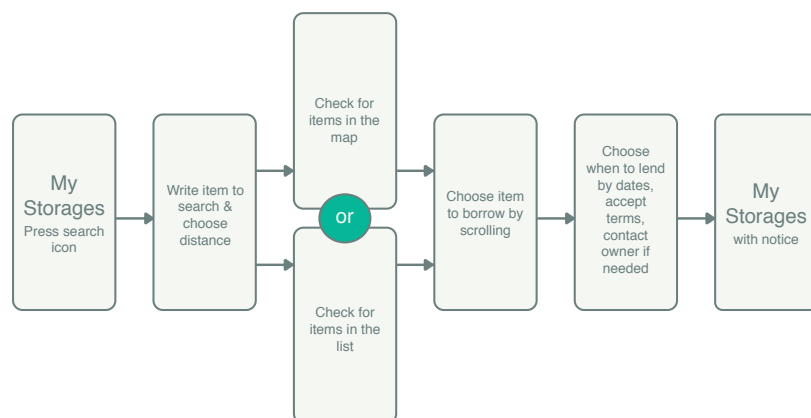


Figure 69. Illustration of the task Search for an item.

The first step of borrowing is to search for what one would like to borrow. Offering a clear and simple search feature will hopefully encourage users that sharing is an option of obtaining products they need. Creating an accessibility to what can be borrowed was seen in the survey results, found in chapter 4.2.2, as important and vital to encourage people to share more. The search feature is visible in the footer on the main page interface, see figure 70. The icon is part of the Sortapp version 1.0, however no features to the icon has been determined. As the loupe icon is widely known in digital interfaces as a type of search function the feature to search for an item in Sortapp has been placed here. The searching for an item activity was shown in the Journey map 1 as a pain and was facilitated in Journey map 2 as the items are accessible in Sortapp. It eliminates the activity of asking many without really knowing if they have the item or if they want to lend the item.

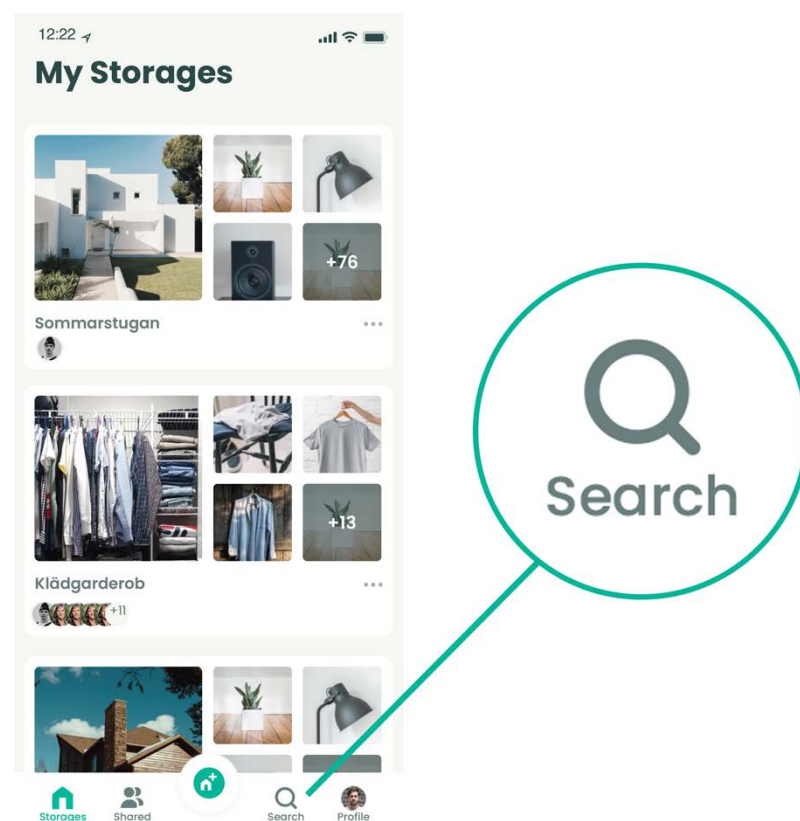


Figure 70. Image of prototype Search icon in the footer of the home page.

When pressed, the search interface appears and two choices can be made to facilitate the search of an item to borrow, see figure 71. The user can either choose to type in a name for the item such as "pall", as well as selecting a range of how far the user would like to search for the item. These choices are not obligatory, the user can choose to fill in both, one or simply none. This was thought to give the search feature more of a browsing interface and mimic an online shopping experience. If for example a user would like to check what can be borrowed in the neighborhood, simply choosing the range would lead to a list of various items in that range that are

available for borrowing. The choice of range is highlighted with a green border, as an indication of selection, as seen throughout the concepts.

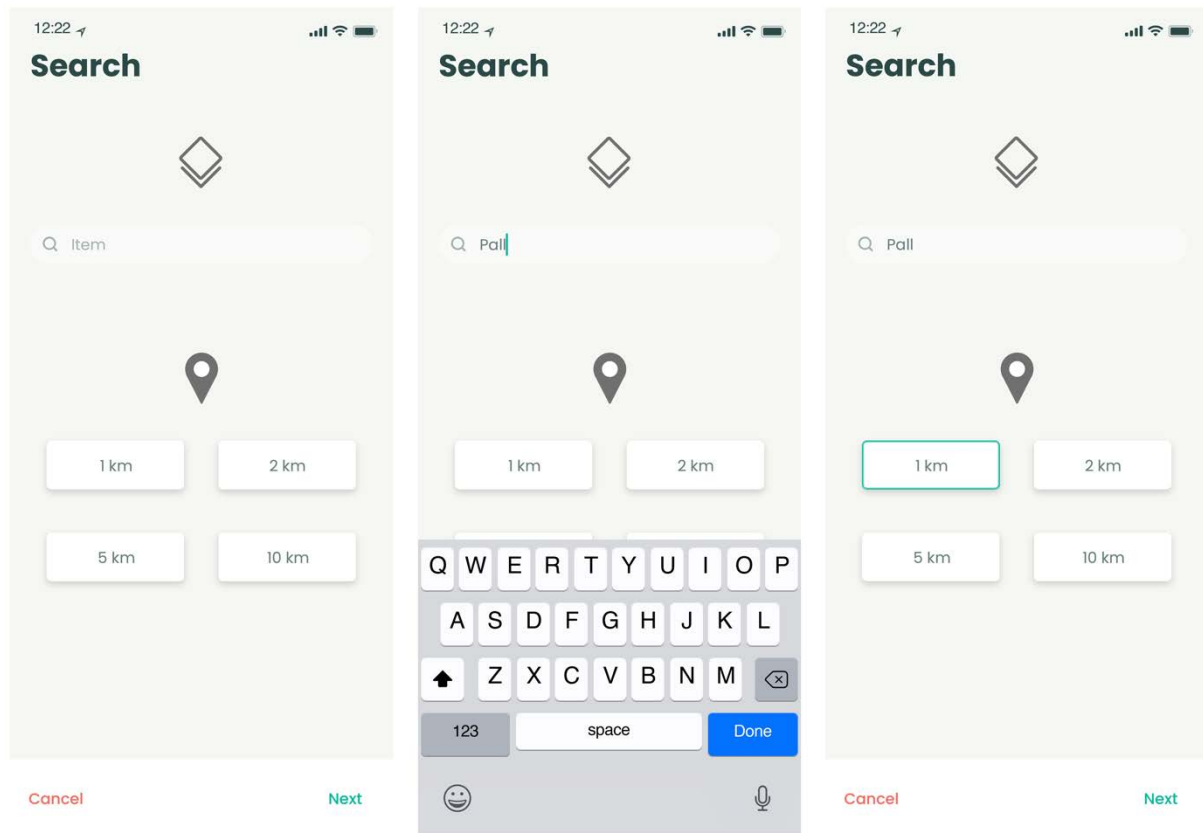


Figure 71. Image of prototypes - Search view, search bar to type an item name and range options to select from.

The result of the search is presented in an interface where important information about each item is visible. The item name, the owner and the distance are displayed next to an image of the item so that the user can easily find what they are looking for, see figure 72. Images and photographs are dominant as Sortapp strives to arrange their content with as little text as possible as it seem to be more pleasing and intuitive for users.

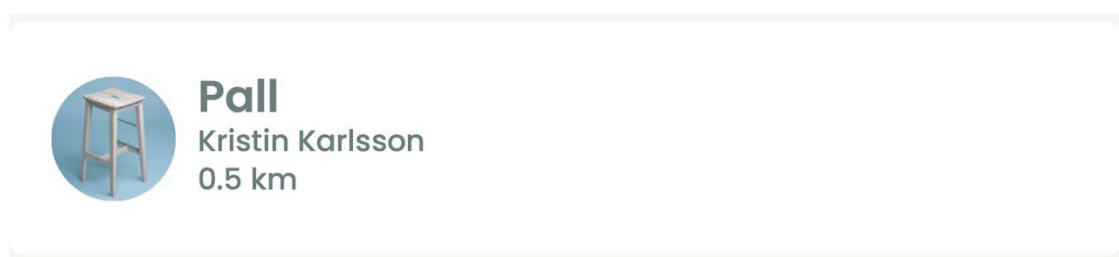


Figure 72. Image of item bar - image, name of the owner and distance.

The Results-interface is divided into two presentation options. The first being to showcase the items on a map as well as a list under the map. The list of items is presented with the closest item at the top and has been designed as such as it was seen in the survey results found in chapter 4.2.2, that people like to share with people near them. Also visualizing the distance on a map will hopefully facilitate the sharing process and encourage people to share more, shown in figure 73.

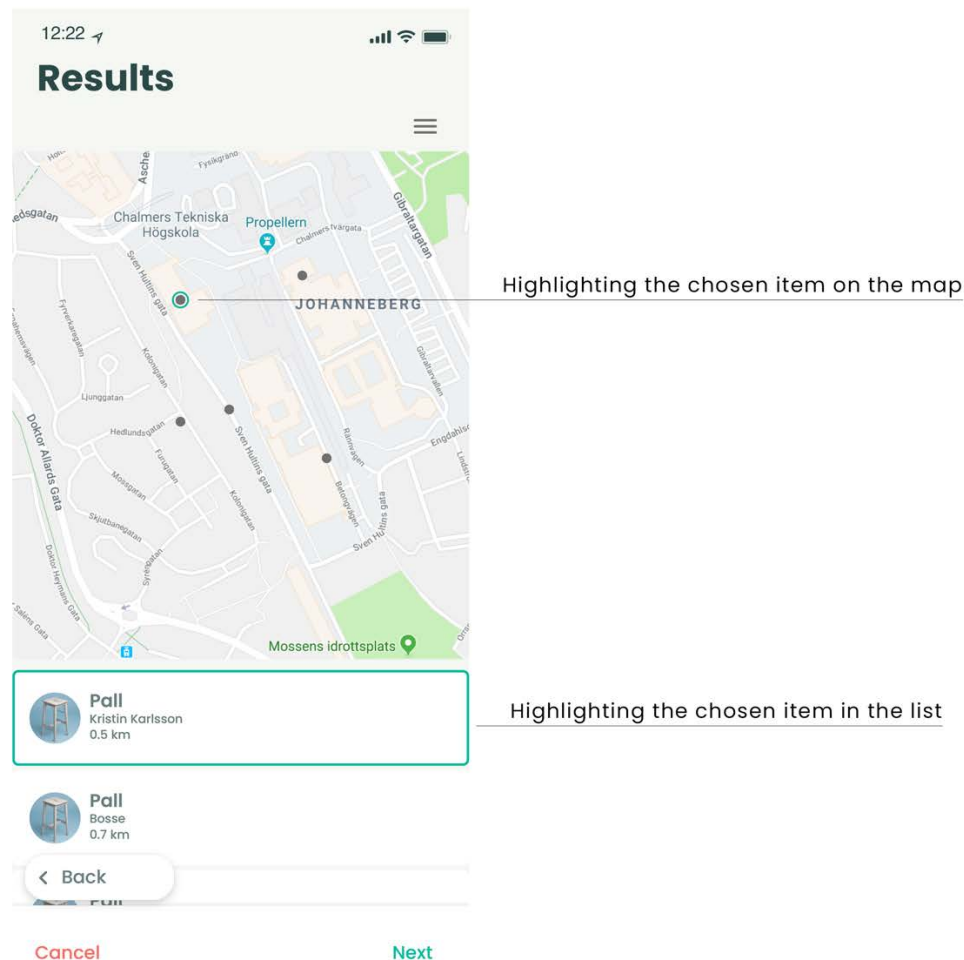


Figure 73. Image of prototype, Map view with scroll option in item list below the map.

When a user is not interested in visualizing the distance on a map, they can select a list view of the items. The list view in figure 74 showcases the images more clearly than the text, as discussed previously, Sortapp would like to see that images are the navigation tool most used and highlighted throughout the app. The items nearest the user is presented at the top, equal to the list in the map view.

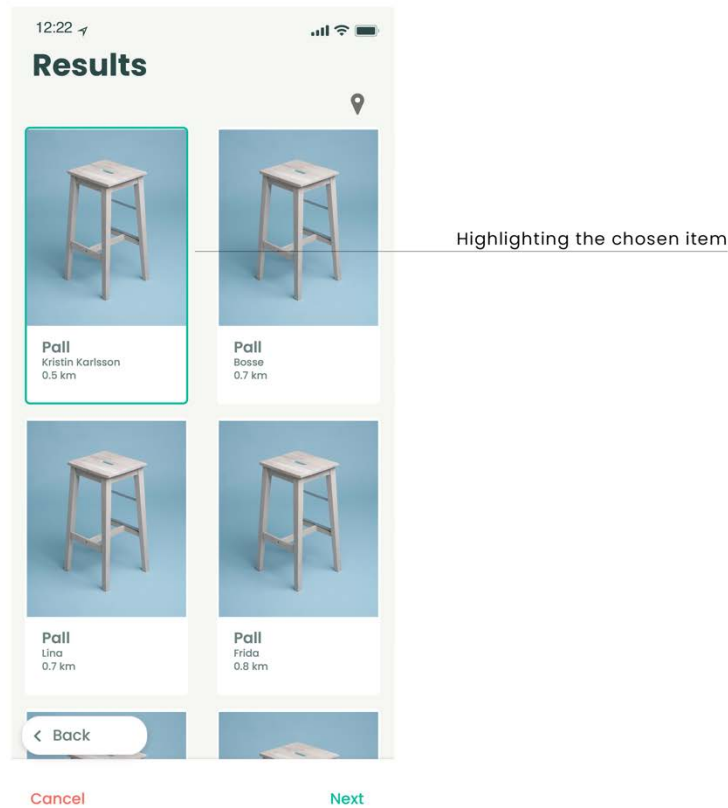


Figure 74. Image of prototype, List view with an alternative of displaying item bar.

The option of switching from an interface of a map and a list has been added as it generates a sense of adaptation and customization for the users, see figure 75. The icon representing the map view is used in many apps as a location symbol and is therefore thought to be useful when describing the feature. The list view is represented with an icon of three lines which is also present in many apps and refers to a list function.

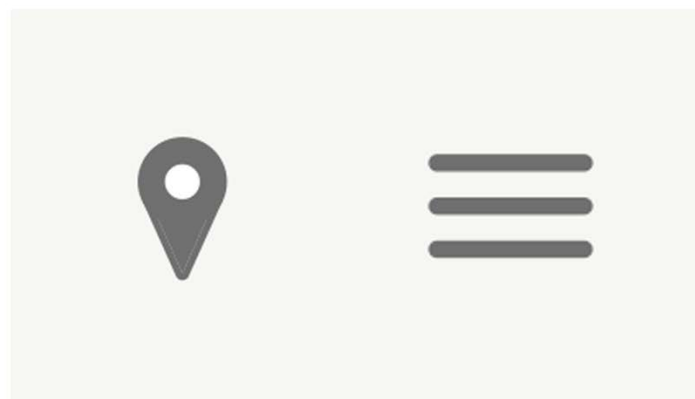


Figure 75. Illustration of icons representing the map view and the list view.

When the user chooses an item, by pressing an item bar, the bar is highlighted with a green border indicating that the user has selected it. By pressing the next button, the user is guided to an overview of the item, see figure 76. Here the user has a chance to better view the item with the added notes, to thereafter choose to borrow the item or not. An option of going back to the list/map interface is easily accessed by having a back button, creating a pleasant browsing interface.

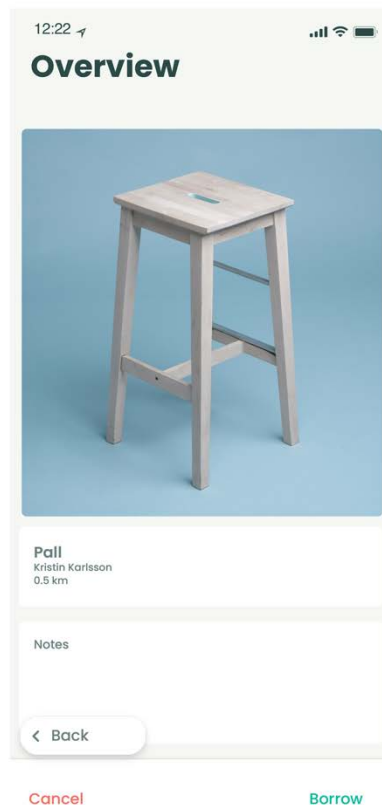


Figure 76. Image of prototype - Overview of an item.

If the user chooses to borrow the item the next activity will appear, see figure 77. The results of the prototype tests showed that the conditions box was not intuitive enough. Therefore, a rearrangement of the content in this interface was completed to the final concept. Placing the selection of dates at the top as it was seen as the first activity the participants wanted to complete during the tests. This interaction symbol is designed as a calendar. The user presses the Date-bar and a calendar appears where a start and end date have to be selected by the user, see figure 77. When start and end dates are chosen, the user presses 'OK' and the dates appear in the Date-bar to confirm the choice, which is also colored green.

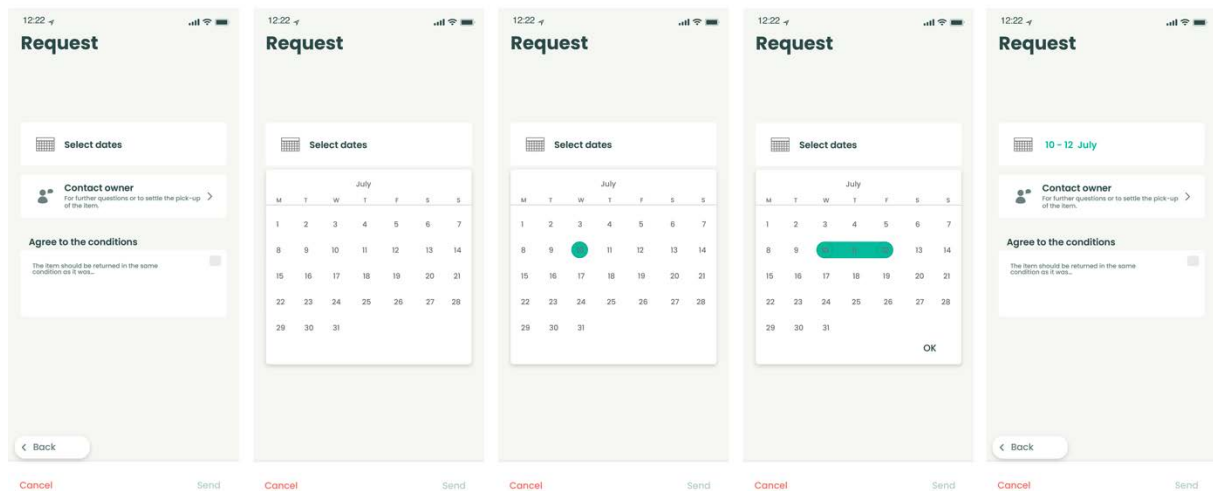


Figure 77. Image of prototypes - Pick a date by choosing to start and end date, selecting OK

Thereafter the Contact owner option is presented. The feature is available if the user would like to ask questions about the item or to settle the pick-up, see figure 78. The user presses the 'Contact owner' bar and is redirected to Facebook or email depending on what the owner has chosen to create their Sortapp account with. Having a communication link is added to help the users have further conversation around items if they feel the need.

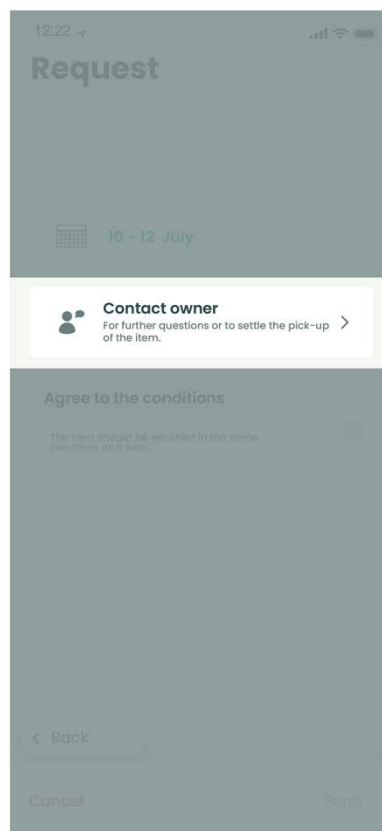


Figure 78. Image of prototype - contact owner bar.

Lastly the conditions box is displayed with a more describing title compared to previous concept, indicating that the user is demanded to accept the conditions applied to the item, see figure 79. The idea of placing the condition box at the bottom of the interface was inspired by other terms and conditions placements on websites. The condition idea is to help owners feel secure when lending their belongings, as this factor was identified as an obstacle when analyzing the survey results as well as in the Journey map found in chapter 4.2.4.

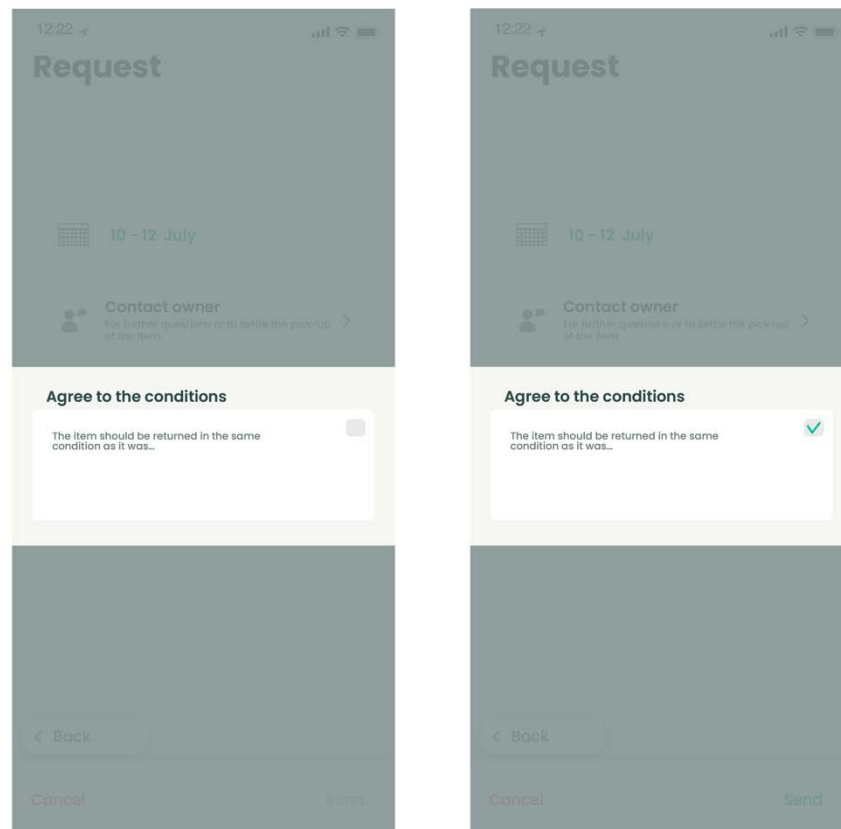


Figure 79. Image of prototypes - When requesting to borrow, accepting the conditions applied to the item is an obligation.

When all selections are made, choosing dates and accepting the conditions, the user can send a request to borrow the item. When the task is completed the user is redirected to the main home page where a notification will appear to confirm that the request has been sent to the owner of the item, with the question to borrow, see figure 80.

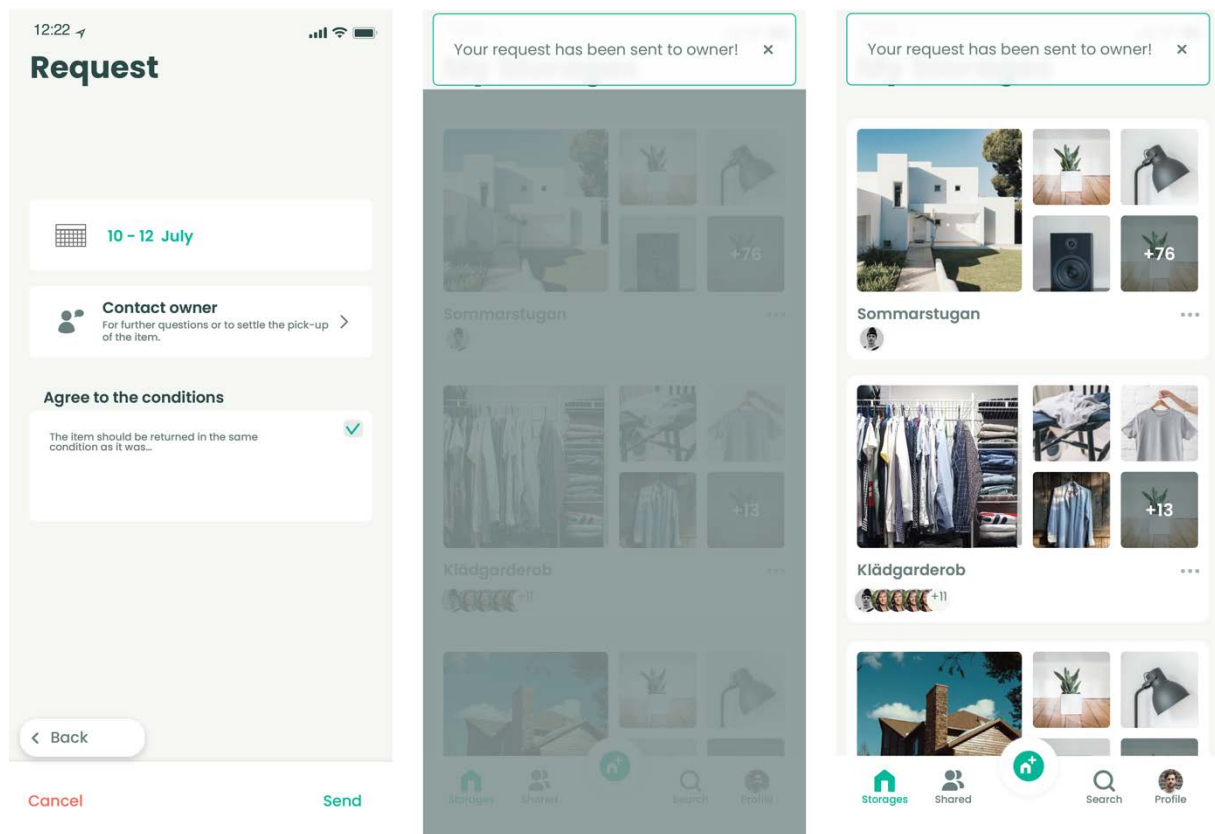


Figure 80. Image of prototype - Notification to inform that the request to borrow the item has been sent.

Search by contact

A secondary option of searching for items to borrow, is to search for a contact, a friend that may have an item that they share with others. An illustration of the task is presented in figure 81.

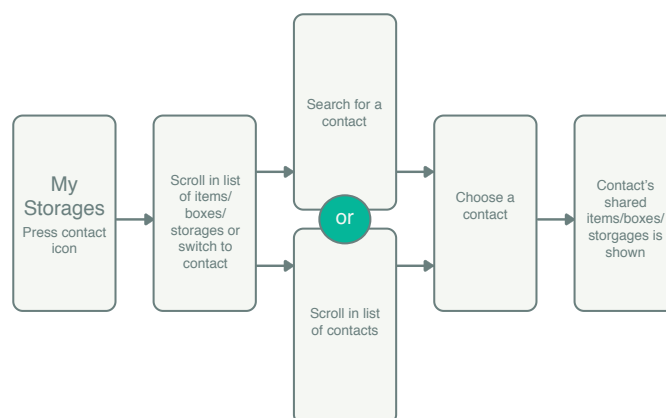


Figure 81. Illustration of the task Search by contact.

This feature is created as a contact list, forming a community in Sortapp, so that users easily can find their friends. The contact list is reached by pressing the people-icon in the footer, see figure 82, as this symbol is commonly used as a signification of friends or a community.

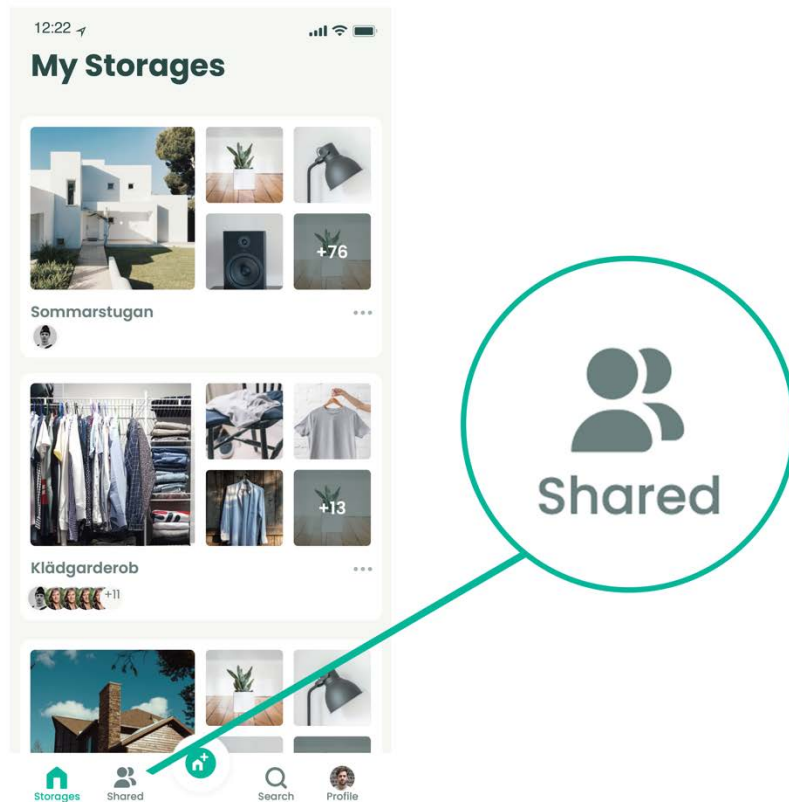


Figure 82. Image of prototype - home page showing the share icon.

When the user presses the icon, a new interface appears on the screen. The user can choose to see what they have to share with others or to see what others share with them. The title Shared lists the items, boxes and storages that the user has chosen to share with "you", see figure 83. This feature is based on Sortapps vision to share storages easily with friends and family and is an established function in the application design. To see the contact list, the user presses the title Contacts placed next to the title Shared. This design is similar to the switch option when adding items and separating them from single to multiple. As an important part of designing interfaces in an app is to develop cohesiveness, that solution was chosen for switching between Shared and Contacts.

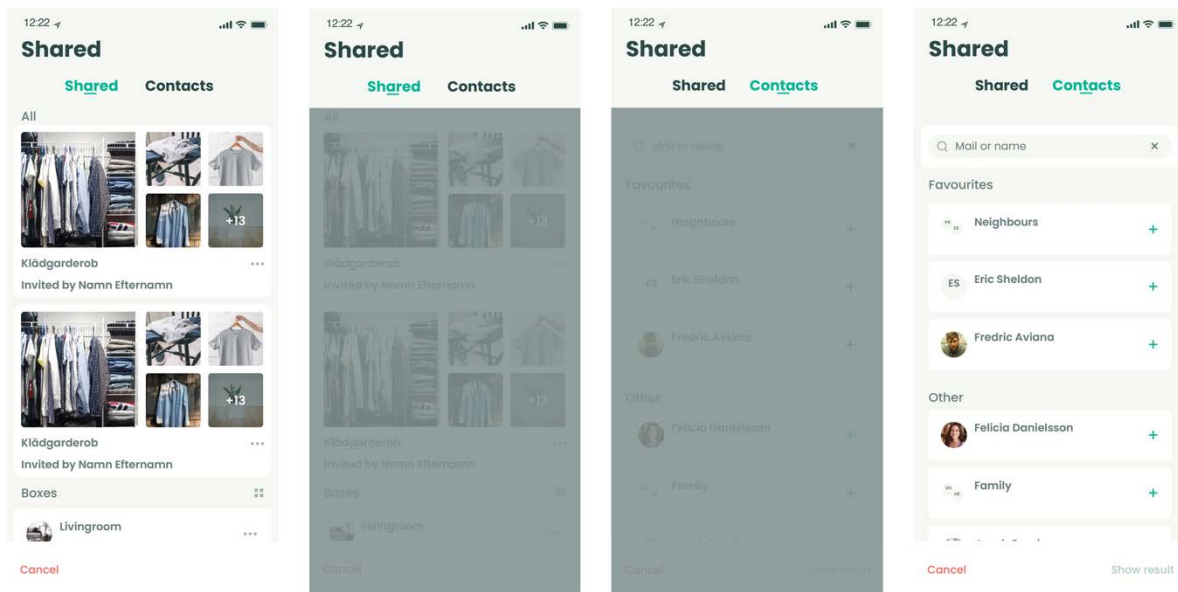


Figure 83. Image of prototype - Shared and Contacts switch.

The Contacts-interface consist of a structured list with Sortapp users and a search bar. The list beneath the search bar presents the Sortapp users that have chosen to share their belongings specifically with you. A division in the list was created to showcase the users that are 'favourites' at the top to have easy access to the users one has the most interaction with through Sortapp, see figure 84. The search bar is to facilitate the search if the contact list consists of many users. The user can only see what other Sortapp users have specifically chosen to share with him or her.

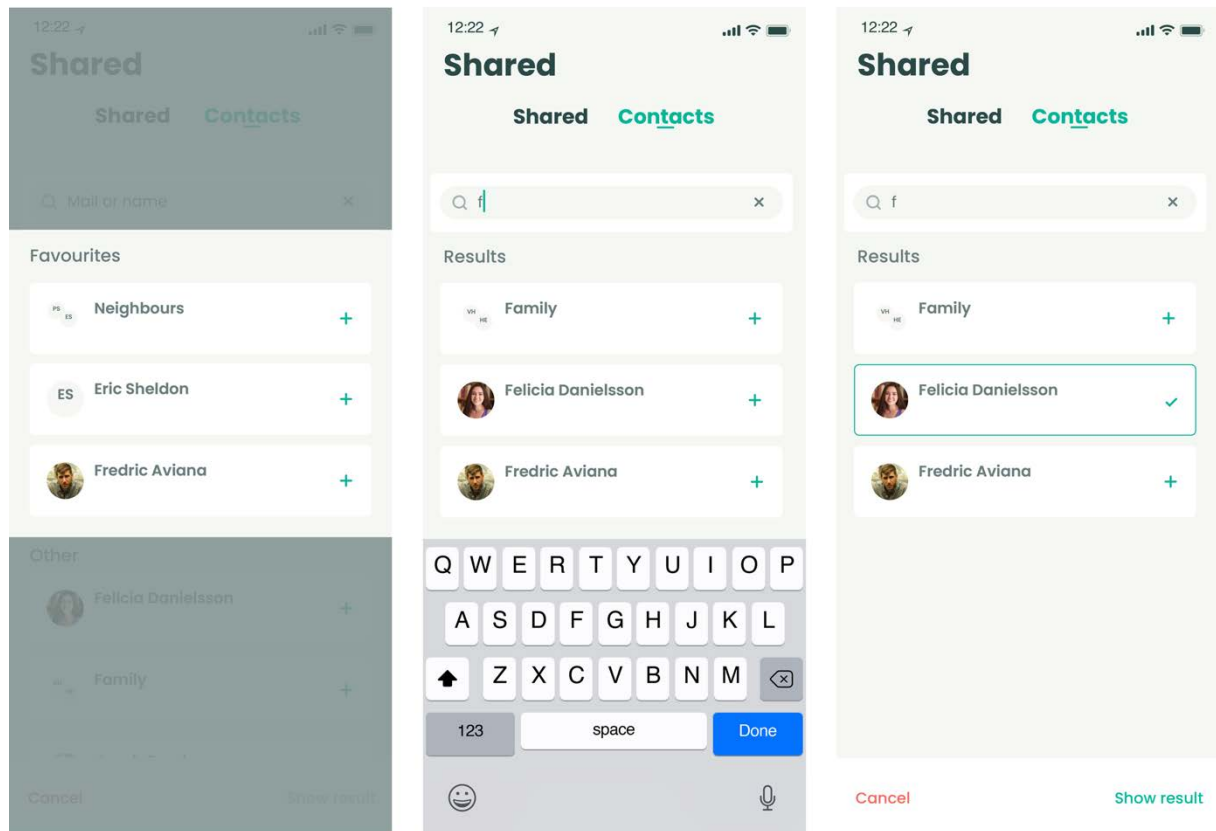


Figure 84. Image of prototype - list of contacts.

The design of the contact bars is identical to the designs found in the concept adding and sharing an item with someone. The users are represented with a small profile image and their name, showing what is important to find and recognize one's friends in Sortapp. When the user has selected a contact and pressed show result, they are presented with an overview of what the select contact chosen to share, see figure 85.

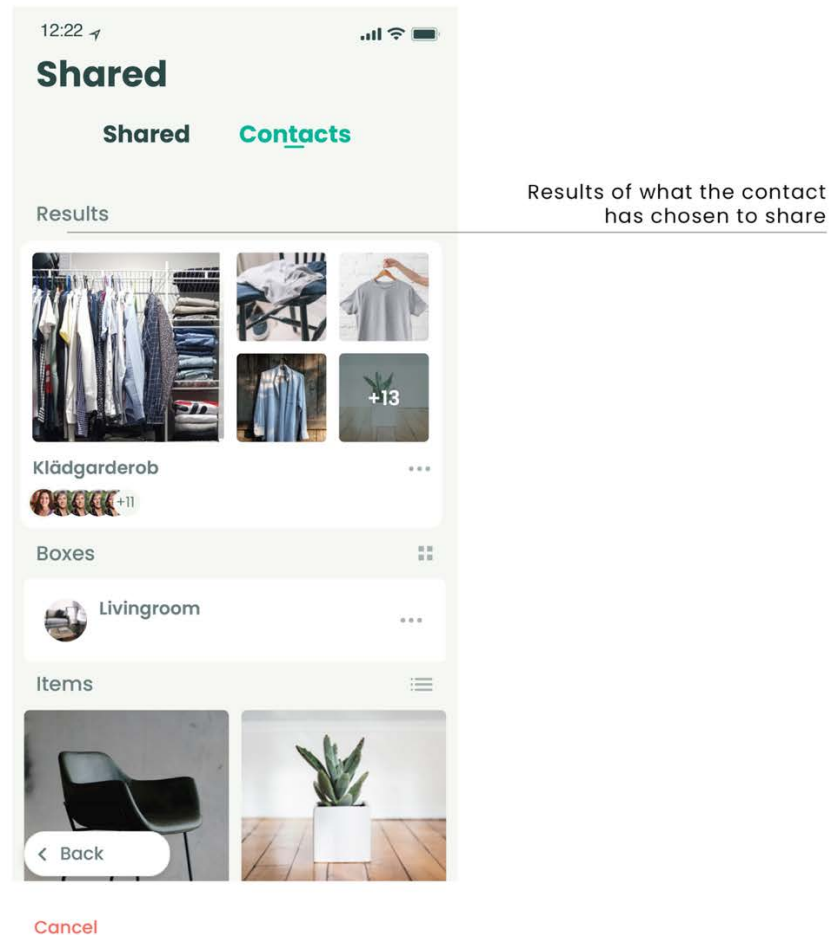


Figure 85. Image of prototype – Showing the results.

Notification center

As Sortapp consists of many functions and happenings, an additional feature was created to build a community around sharing items, a notification center is essential. A notification center will help users find the right information and updates on what has changed. During the prototype tests the participants were presented with two different solutions. The outcome showed that the prototypes needed further development and changes. A new solution is presented in the final concept and is inspired by the previous two ideas. An illustration of the task is presented in figure 86.

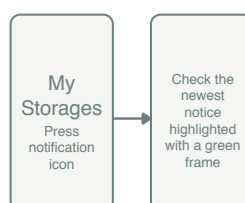


Figure 86. Illustration of the Notification center.

Placing a bell icon at the top of the page, see figure 87, and creating a visual and accessible alert feature. The bell is recognized as an alert and message symbol and is therefore thought to guide users to retrieve information. Indicating that a new notification has been received a small red circle, taken from one of the previous concepts, can be placed on the bell. When the bell is pressed, an interface of a list of notifications are presented. The notifications that are newly received and not yet read are highlighted with a green border. This design idea was to bring attention to the notification and guide the user in this interface. When the notification has been seen or interacted with the border switches to no color, signaling that the user has viewed the notification.

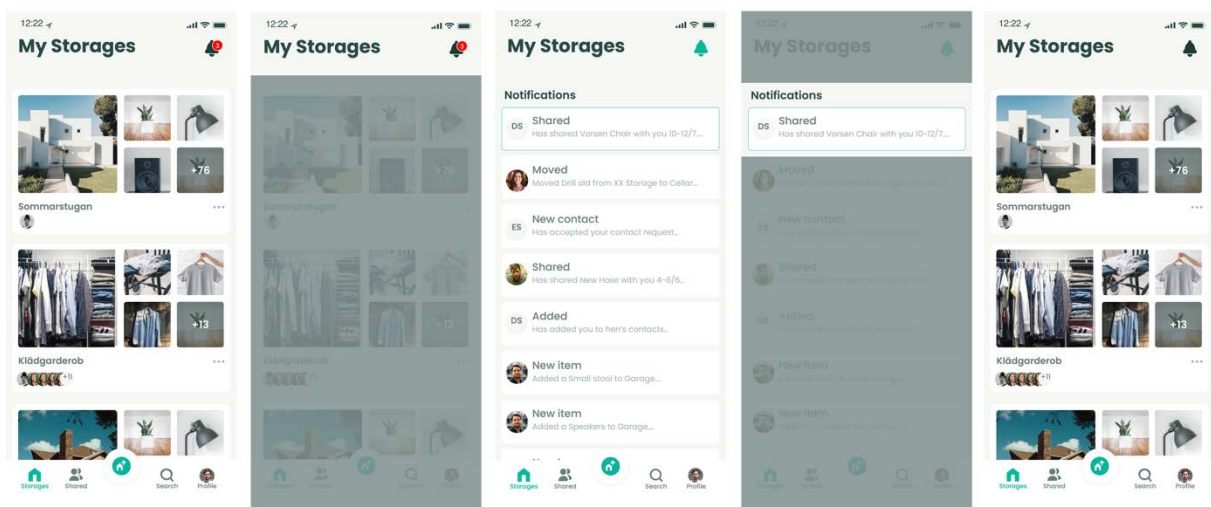


Figure 87. Image of Notifications in the bell symbol.

Nudging to share

To support and advocate the sharing function when adding items to Sortapp a suggestion of a nudging solution was developed. When a user adds an item as a single or a multiple and does not choose to share with friends and family via the app, a message will appear before completing the task off adding item/items. This message will ask the user if they would like to share the item/items that they are adding to their Sortapp storage, see figure 88 and 89. The user has two options of 'YES' or 'NO'. When no is chosen the user is redirected to the home page where a notification will appear to inform the user that the item/items have been added successfully, see figure 88. If the user chooses to select 'YES' they are redirected to the previous interface of adding a single or multiple item. The share icon is highlighted, visualized by coloring, for the user to fill in the coming steps when sharing and item, as in presented in concept of adding an item and sharing see figure 89.

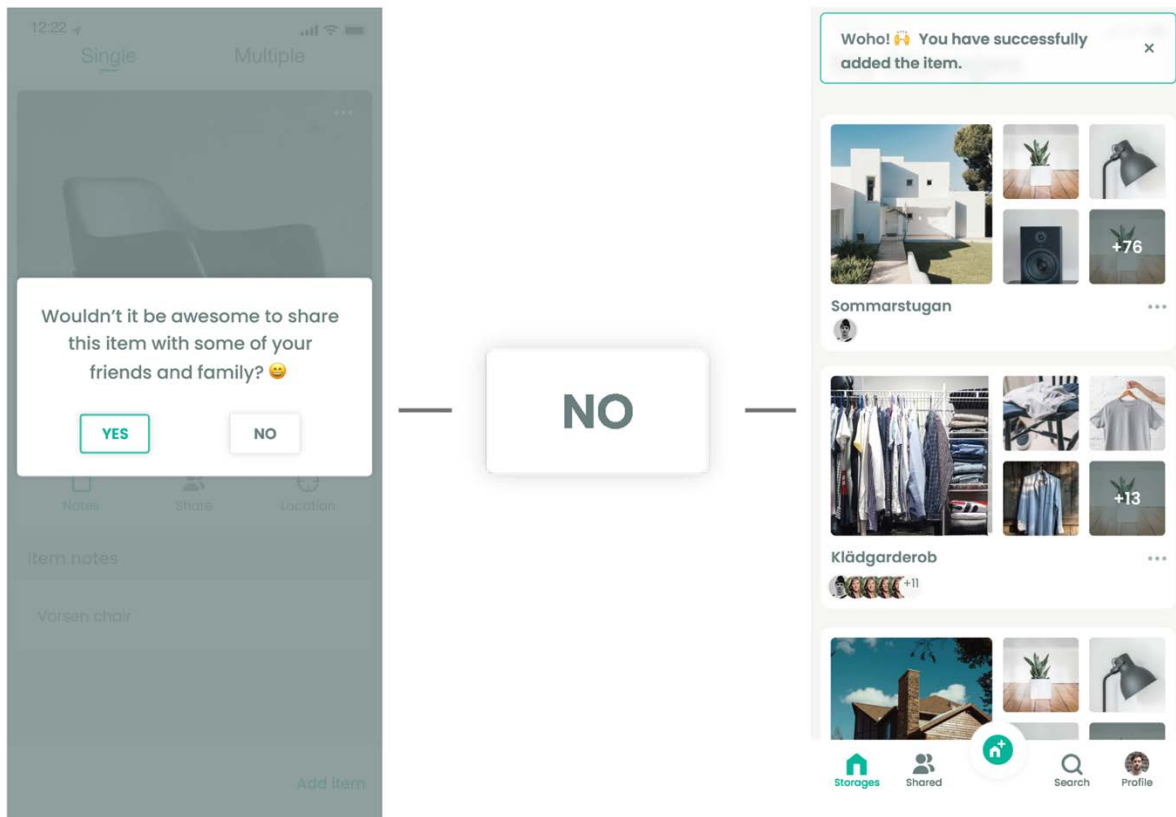


Figure 88. Image of prototype, when NO is pressed the user receives a notification that the items have been added.

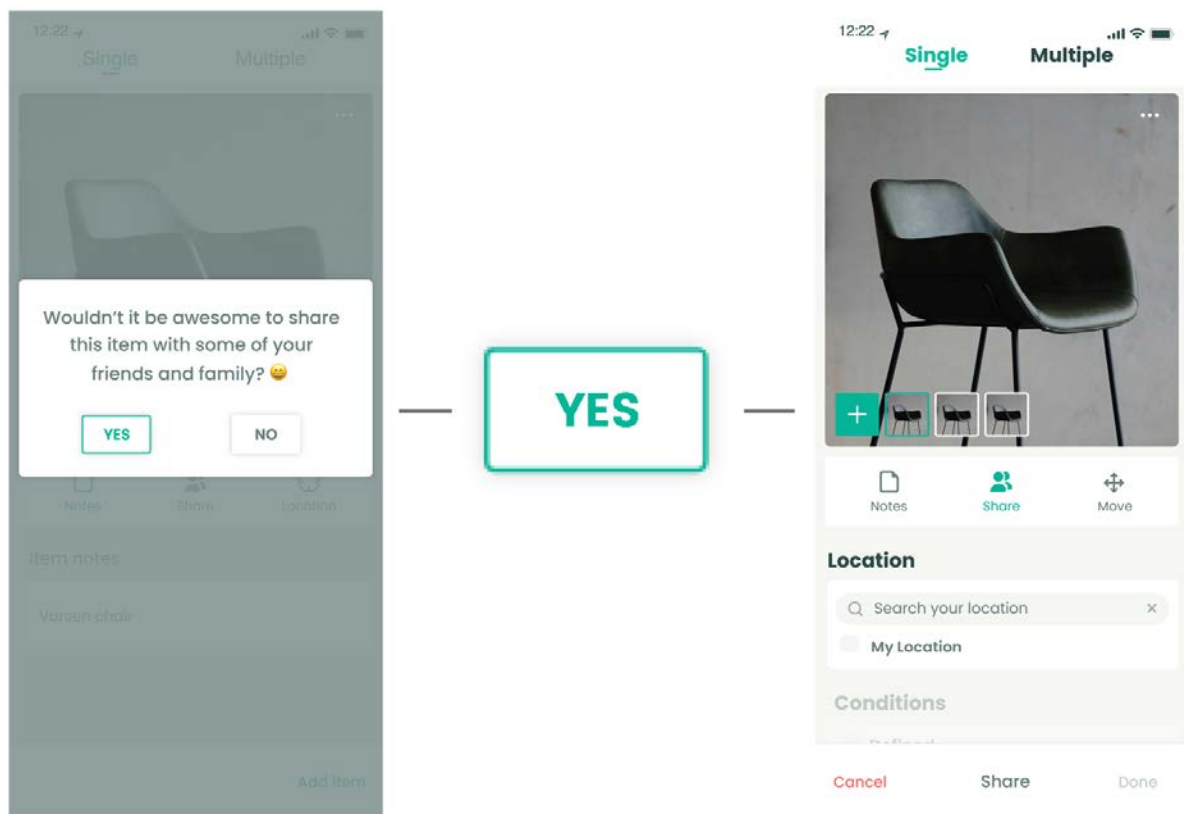


Figure 89. Image of prototype, when YES is pressed the user is redirected to the Share feature.

The nudging solution is to help users familiarize with the sharing function in Sortapp when adding items, to support sharing as a solution when in need of a product. The idea needs to be further discussed of how often the message should appear. An idea is to make it appear the first ten times when adding or offering the possibility to turn off the message in Sortapp settings.

Pile images to group

When exploring the feature of adding multiple items and sharing, an additional function was created. The option of grouping pictures in the multiple items interface, see figure 90. This is done by a drag and drop function; holding the image that is to be grouped, dragging it to another image and dropping. This solution is similar to other interaction features when wanting to group, such as in Apple interfaces when grouping applications in an iPhone interface. The item with the grouped images is shown by adding dots at the bottom of the image, indicating that there are several images, see figure 90. This function is to facilitate the task of adding multiple items. The drag and drop solution were seen in early tests of the Sortapp version 1.0 as an appealing function. Grouping images, items and boxes by drag and drop is therefore thought to be helpful in the app, to facilitate the interaction.



Figure 90. Image of prototype - Merging two images/items to one, visualized by two dots on the merged image.

07.

Discussion & Conclusion

This chapter presents the discussions about the thesis results, regarding the aim, purpose and the four objectives from the introduction. Finally, a conclusion of the thesis is presented.

7.1 Discussion about the results and the objectives

The aim of this project was to explore how the application, Sortapp, can be further improved and adapted to users' needs. This has been achieved by fulfilling the objectives; identifying relevant users before launching Sortapp v.1.0, identify needs people have and what/how people do when managing, sorting, storing, sharing and selling products they do not use, identifying and prioritizing functions that are relevant to include in the app to meet user needs, create a finalized concept with functions based on the user needs.

7.1.1 Identify and target relevant users before a launched product

Identifying a target group before a launched product was somewhat difficult. The app is today constructed by features and functions to support a storing and organizing vision and aim. Sortapp's long term vision and idea is to also be able to share and sell items/belongings through Sortapp. These three main functions can be related to different target groups. The project first aimed to target a broad user group when researching and analyzing the sorting and organizing element. This broad target group showed that many did not feel the need to organize their storages and items digitally. This led to believe that an encouragement, an enticement, would be needed to reach potential users. Therefore, a new target group was chosen to study. The target group was defined and established in collaboration with Sortapp and is a hypothetical target group of potential users. The hypothetical target group consists of people that are more environmentally conscious, that make an effort to change their daily consumption habits for a more sustainable society, buying second-hand etc. It is thought that an app helping users in organizing, managing and sharing belongings would appeal to an eco-friendly user as it will help decrease consumption.

The hypothetical target group was difficult to reach in person which might have led to an uncompleted data collection of their thoughts and needs. It was thought that surveys distributed to eco-friendly groups on Facebook, consisting of the hypothetical target group, would give good results for the project. The outcome of the survey was informative enough for this project considering time limitations. The more environmentally conscious were a convincing target group for Sortapp when adding the sharing feature to the already established organizing element of the app after analyzing the collected results.

7.1.2 Identify needs people have and what/how people do when managing, sorting, storing, sharing and selling products they do not use

One of the objectives was to identify needs people have and what/how people do when managing, sorting, storing and sharing products they do not use. When

identifying people's unknown needs, it was important to get insights on how they do things today, finding out the difficulties and then ideate solutions to solve them.

The beginning of the projects started out by testing the existing application (v.1.0). This was completed to gather opinions on how the app is received by new users, unfamiliar with the various features. The first tests, completed by the authors of this thesis, set a foundation to all the user tests to come. The user tests performed on other test subjects was used to confirm the first found issues and pains. Studying other's experiences and difficulties during the tests, became easier to comprehend and the mistakes were easier to detect.

During the user tests the documentation mainly consisted of filming the test subjects' hands interacting with the application downloaded on an iPhone. This method of documentation was useful when presenting the studies to the company as well as having the ability to review afterwards. To variate the tests, the subjects in the discussion groups, interacted with the application separately and wrote down own notes on how they felt about the app and what pains and difficulties they encountered. The test subjects varied both in age, gender, education and interests which was preferred as no target group was determined at this stage. The test subjects all had similar difficulties during the interaction, and they felt that an app used only to document all belongings at home might be difficult to reach out to people as the "gain" is hard to understand, due to the work that is needed to be done to document everything the first time. The initial plan was to test the application on more people. However, the test results showed a saturation and a decision to stop was made. This was completed when the tests results started to be more and more similar, regarding the identified issues and pains.

As a result, from the information the user tests brought, a survey was sent out to get an insight on how people store and organize things at home. This was completed to see if/how Sortapp can facilitate the process for the users. To see if people actually organize their storages at all, what pains they have regarding storages etc. The survey was successful as 864 people participated, which made the results varied and reliable. The information did not give knowledge on how Sortapp can facilitate sorting because many people had their certain ways of sorting and did not see the gain in documenting. Therefore, another reason for sorting items had to motivate people; documenting items to share. A motivation would be to encourage people to be more sustainable, by not always buying new things when in need and also consume less. Using a survey as a method to gather insight and information about users worked well for this project as surveys are not that time consuming. For further exploration on how people store and organize items it would be helpful to complete observations to fully grasp the activities. A second survey was addressed to a narrowed down target group of environmentalists as well as a few others to see how people share items today, what they are willing to share, their interest in sharing etc. With answers from little

over 200 participants it resulted in a big will of sharing things, mostly among the closest; family, friends, relatives but also neighbors and colleagues. The result was surprisingly informative and cancelled the plan of meeting people for interviews. The results gave all important information of the difficulties of sharing as well as the knowledge that there is a desire to share more, but in an easier way than today. However, interviews and observations might have given more information and more outspoken needs to consider.

To analyze the results of the survey the Journey map- method was used to find out the existing difficulties of today's sharing process. There were some pains found and the most recurring one was to **ask around for a certain item**. A second Journey map was made to find out the difficulties of sharing with Sortapp, which showed that the entire journey became smoother and that many pains a user experienced when sharing could be eliminated. For example, the pain that was the outcome of having to ask around for an item was removed from the sharing process described in the journey map with Sortapp. The method was well suited for analyzing and following a certain items journey and it was important to have all activities in consideration to understand each users' actions, decisions and behavior during the journey. The tool confirmed that Sortapp could have an impact and facilitate the sharing process for people. The method can also be used to analyze the process of selling items, which is a future goal and feature Sortapp wishes to add to the app. However, that has not been touched upon during this project as it exists in various applications today and therefore was not seen as a prioritized need to solve. The Journey maps are made by assumptions, on a hypothetical items journey, generated from the survey results. Therefore, the accuracy of the journey map results may not be complete and if the method is used again to analyze other parts and processes a more reliable journey would be preferred. Choosing to follow a process by observing test subjects when completing specific activities may give greater insights. Due to certain limitations the project encountered, such as time and test subject obtainment, this was not completed. However, the survey results did bring good insights on the issue and was therefore seen as a good basis to use when analyzing with the Journey map method.

7.1.3 Identify and prioritizing functions that are relevant to include in the app to meet user needs

The needs that were identified in the studies of storing/organizing as well as sharing were translated into functions. The functions were suggestions and concepts on how to solve issues regarding user needs. As the project process was completed in an overlapping manner, when ideating through the entire process and solving minor issues during the project, many functions and features were being re-analyzed and re-evaluated along the way. Working in a parallel process was a great way of working when dealing with smaller elements of a development process. The process helped

bring forward several concepts on various smaller features to complement the use and goal of Sortapp.

By completing priority lists the most essential functions could be identified for further development. Phase 1, sorting and organizing home inventory, led to a priority list on what functions and features the app v.1.0 needed to prioritize to create an intuitive base for Sortapp. The list originated from the needs that were identified in the user studies involving the sorting and organizing functions. The changes and improvements have not been included as visual results in this thesis, as the improvements were designed and developed by Sortapp. When prioritizing which functions to develop regarding Phase 2, sharing with Sortapp, a selection of important general activities generated from the Journey map was made. These important activities were chosen as they were seen as the functions with the most potential to meet user needs when sharing items. The method of prioritizing by listing the most important issues to further develop was essential for the project to be able to narrow down to relevant results and concepts. This has also forced the project to understand the foundations of creating an application. However, the priority lists all depend on the outcome from the completed methods of gathering data related to user need. And as discussed, some of the methods used to gain insights on user needs, user experience and user motivation may have led to somewhat incomplete data. Therefore, the priority lists may also have led to incomplete prioritization and so forth. However, in this project and thesis, the methods used and the outcome of these methods were considered as good foundations for the task at hand.

7.1.4 Create a finalized concept with functions based on the user needs and theoretical studies

The theoretical study gave great knowledge on how important it is to reduce consumption. Studying consumer circularity can lead to better understanding the user perspective on how to obtain and get rid of products. This can thereafter lead to prolonging a products life by generating more lifecycles, which is where the project believed Sortapp could be of help. To facilitate the transfer of a product from one user to another exchange agents would help facilitate the process. The new sharing feature in Sortapp creates an accessibility of items and products and generates better communication between owners. The app works as an exchange agent by encouraging and facilitating the sharing process between users. By helping people share more of their stored items the need of buying new items will hopefully decrease which will thereafter reduce consumption and the negative impact on the environment. As the theoretical study showed, not many exchange agents regarding the sharing process are available on the market today. The user studies and the survey on consumption showed that there exists a demand and a need for a communication tool when sharing items with others. Therefore, the adding of a sharing feature to

Sortapps foundation seemed very relevant, both in regard to the theoretical study and the user study.

As the project has been a process consisting of three overlapping phases, user needs and pains have been solved throughout the process in collaboration with Sortapp. Minor issues found in the initial tests were solved quickly by Sortapp, while greater pains from the priority list have not been fully developed and applied to the app. Working with a project that consists of overlapping phases, regarding different user needs and parts of an application, can in some cases create disorganization and an unbalanced time distribution. If the project only had focused on one feature of Sortapp, for example the sharing feature, more thorough and reliable results would have been accomplished. However, for this project, working with both Sortapp v.1.0 and on how to add a new feature to the existing foundation has worked as a benefit. The outcomes from all phases resulted in achieving final concepts related to Sortapps goal and new knowledge has been gained throughout the process.

The ideation phase was somewhat difficult due to the new way of approaching the product as a digital tool consisting of many small elements. The issues and activities found in the Journey map were divided in three parts and each part was further defined to problems to be able to create features to solve the problems. The process of first ideating on paper and thereafter refining the sketches in a prototyping tool, Adobe XD, generated quick evaluations of details and was very rewarding. Also having a foundation and base, Sortapp v.1.0, helped generate ideas to compliment Sortapps already established design. However, the foundation can also be seen as a hindrance for when ideating new solutions. The already established icons and colors may have blocked the process of thinking outside the box when ideating. These established designs are however related to the UI part of developing an app, which was not to be explored in this thesis. Therefore, the issue of hindrance due to the existing design of Sortapp was not necessarily seen as having a negative impact on the ideation phase.

The concepts were roughly evaluated when testing the prototypes. It led to some minor changes to the design of the concepts. Most importantly the evaluation led to insights on future work to complete on the concepts. The concepts were overall well received by the test participants. The tasks given to the participants when testing the concepts were more or less fully completed and understood. The final concepts include the three issues found in the journey map:

1. Simplify the activity of adding items to the app and facilitate the communication of terms and conditions regarding the items to others.
2. Ease the riddance phase of lending the product by facilitating the communication process with other conversation platforms.
3. Facilitate the search for items, communicate the terms and accessibility of the item in a clear way.

These three activities are part of the first half of the journey map. The final parts have not been studied and explored due to the choice of prioritization as the thesis could unfortunately not explore the entire journey. It is therefore important when developing the final concepts from the project further, that the other activities found in the journey maps are also handled. The concepts and the added sharing feature are made to help people through an entire sharing process. Also, some identified pains such as adding an item to Sortapp was not fully eliminated. The project did not find ways on how to facilitate the process of adding items to the app. The only type of encouragement given to add items to Sortapp was to create an enticement, therefore the concept of a sharing feature. This pain and main obstacle identified in the journey map will need further exploration to be able to fully understand how to solve the issue of adding an item to Sortapp.

7.1.5 Sustainability & ethical issues

Overconsumption is a great issue, and many are starting to realize that action needs to be taken. One way of decreasing negative impact on the environment is to choose to reuse resources. Re-using resources can also mean re-using items and products. Re-using items can be done by choosing to buy second hand or by sharing belongings with others. Sharing items and belongings that are occasionally used is a need and a desire that has been validated in this project. The user studies on sharing, by lending and borrowing items with others, have shown that there is a great demand to do so. However, there are struggles that hinder people from accomplishing this today. The most critical struggle is to communicate the desire to lend and borrow, there is a lack of a communication agent/tool.

This demand has resulted in a feature added to Sortapps base, to meet user needs. The feature is a concept on how users can share their items with friends and family through the app. Facilitating the idea of sharing, encouraging people to share more for a sustainable future. To nudge users to share as much as possible a message of sharing belongings has been added to the function/feature of storing items. This message will appear when a user is adding items and not choosing to share them with others. Users will be reminded of the feature and are offered the possibility to share their belongings. Hopefully a sharing message will bring awareness to overconsumption and making sharing as much of an option as buying or renting an item when exploring obtainment opportunities. The sharing feature will facilitate the accessibility of occasionally used or even unused items and also contribute to a sustainable future.

No complications regarding the ethical issues mentioned in the introduction regarding the aspect of not displaying confidential information about the existing app or the company have been noticed during the project. The GDPR- law, the privacy of

test subjects and the choice of being anonymous have been taken into consideration. No names as well as no pictures have been used in the report. All user tests and survey have been done by free will and no bribes or rewards have been handed to obtain participants.

7.1.6 Concluding of aims and purposes

The aim was to further develop Sortapp and improve the existing application. Also, adding a feature to help reduce the overconsumption and support a new movement towards a circular consumption. The developed Sharing feature presented in the project has established a way of reusing each other's stored items, instead of buying new items. Creating a sharing community in Sortapp might work as an enticement and can encourage people to sort their stored items. The enticement of sharing is decreased consumption which reduces the negative impact on the environment. Sharing can also contribute to an improved personal economy, by offering an optional obtainment source that does not simply spending money.

When creating a sharing community within Sortapp it is essential that trust and security is offered when sharing items. There is a need of established rules and terms that follow the activity of sharing. That both users of a sharing process, the lender and the borrower, can communicate and come to an agreement on what applies to items shared. These certain terms have to be established in order for the sharing feature to be fully functional and that is something that Sortapp needs to explore further. The project has created a basis for a sharing feature to add to Sortapp. Future work is to further develop this feature by designing additional high-fidelity prototypes to test, preferably on right sized iPhone models. Issues such as UI design, establishing membership levels, integrity and insurances are required to improve the feature and Sortapp overall.

7.2 Conclusion

This master thesis project explored how the application Sortappv.1.0 could be further improved by identifying user needs. The theoretical studies were used as a basis to understand Sortapps goal of supporting the new movement towards circular economy and circular consumption. The sharing behavior has been studied and a benchmark on selling and renting applications was completed for a better understanding of customer demands and if they were fulfilled.

The three main phases of the project process; *Exploring Sortapp v.1.0*, *Analyzing sharing process*, *Ideation, concept generation and evaluation* have been explored in an overlapping manner. The three phases have guided the project on how to improve Sortapps existing foundation by several user tests and by helping the company prioritize their work and features to develop. The phases have also resulted in the adding of a new sharing feature.

The identified demand of a tool and an agent to help communicate sharing items by offering accessibility has been solved by adding a sharing feature to the foundation of Sortapp. The features designed in the final concept are solutions on how to improve the first parts and activities, identified and prioritized in the in the project's user studies, of a sharing process. To offer a complete sharing process through Sortapp and ensuring a positive user experience, further activities identified in the journey map are in need of additional improvements. Sortapp and the new sharing feature promotes a sustainable option of product obtainment and encourages circular consumption.

References

Allen, M.R., O.P. Dube, W. Solecki, F. Aragón-Durand, W. Cramer, S. Humphreys, M. Kainuma, J. Kala, N. Mahowald, Y. Mulugetta, R. Perez, M. Wairiu, and K. Zickfeld. (2018). *Framing and Context. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press.

AirBnb. (n.d). *Hitta boenden i Sverige på Airbnb*. Retrieved 2019-03-10 from https://www.airbnb.se/a/?af=43720035&c=.pi0.pk5006346894_263386157897_c_12026464216&sem_position=1t1&sem_target=kwd-12026464216&location_of_interest=&location_physical=1012511&ghost=true&gclid=Cj0KCQiAn4PkBRCDARIsAGHmH3eDqH6rgyKrSaibQJTHqiLYKw3t5BQzoWo3xLis1KDemc-xhtLLLxgaAq4UEALw_wcB.

Andrews, D. (2015). *The circular economy, design thinking and education for sustainability*. Local Economy, 30(3), 305–315.
<https://doi.org/10.1177/0269094215578226>

Apple. (2019). *App Store- förhandsvisning, Hygglo*. Retrieved 2019-03-18 from <https://itunes.apple.com/se/app/hygglo/id1103737624?mt=8>

Apple. (2019). *App Store- förhandsvisning, Shpock: Sell, Buy, Classifieds*. Retrieved 2019-03-18 from <https://itunes.apple.com/se/app/shpock-streetloppis-k%C3%B6ps%C3%A4lj/id557153158?mt=8>

Apple. (2019). *App Store- förhandsvisning, Quick Peek*. Retrieved 2019-03-18 from <https://itunes.apple.com/us/app/quick-peek/id1360613074?mt=8>

Apple. (2019). *App Store- förhandsvisning, Sortly - Inventory Simplified*. Retrieved 2019-03-18 from <https://itunes.apple.com/us/app/sortly-inventory-simplified/id529353551?mt=8>

Beyond Retro. (2018). *Beyond Retro- Vintage clothing*. Retrieved 2019-03-13 from <https://www.beyondretro.com/>.

Blocket. (n.d). *Blocket*. Retrieved 2019-03-10 from <https://www.blocket.se/>

Dr Shukla. J. (2018, 16 July) . Consumerism and climatic change. *The New Times, Rwanda's Leading Daily*. Retrieved 2019-05-07 from <https://www.newtimes.co.rw/business/consumerism-and-climatic-change>

Ebay. (1995-2019). ebay. Retrieved 2019-03-10 from https://www.ebay.com/?ef_id=CjwKCAjw1KLkBRBZEiwARzyE7xcAT7oNBKQBURnrOlv9ij2dqV04sGrpCwV4B64HUwfQ4XESrtvRjBoCXmkQAvD_BwE:G:s.

Ellen MacArthur Foundation. (2017). *What is a circular economy? A framework for an economy that is restorative and regenerative by design*. Retrieved 2019-03-25 from <https://www.ellenmacarthurfoundation.org/circular-economy/concept>

Emmaus. (n.d). *Emmaus Sverige*. Retrieved 2019-03-13 from <http://emmaus.se/>.

Esposito, M., Tse, T., & Soufani, K. (2018). *Introducing a Circular Economy: New Thinking with New Managerial and Policy Implications*. California Management Review, 60(3), 5–19. <https://doi-org.proxy.lib.chalmers.se/10.1177/0008125618764691>

Facebook. (2004). *Facebook*. Retrieved 2019-03-10 from <https://www.facebook.com/>

Dagens arena. (2018). *Så fördelar sig nätläkarbesöken geografiskt*. Retrieved 2019-03-14 from <http://www.dagensarena.se/innehall/sa-fordelar-sig-natlakarbesoken-geografiskt/>

Hygglo. (n.d). *Hyr istället för att köpa- Nära och på tider som passar dig*. Retrieved 2019-03-10 from <https://www.hygglo.se/>

I am not my pixels. (2017). *How to: Run a Crazy Eights exercise to generate design ideas*. Retrieved 2019-04-04 from <https://www.iamnotmypixels.com/how-to-use-crazy-8s-to-generate-design-ideas/>

Interaction design Foundation. (n.d). *Minimum Viable Product (MVP) and Design - Balancing Risk to Gain Reward*. Retrieved 2019-04-04 from <https://www.interaction-design.org/literature/article/minimum-viable-product-mvp-and-design-balancing-risk-to-gain-reward>

Janson, A &. Laninge, N. (2017). *Beteendedesign : psykologin som förändrar tankar, känslor och handlingar*. Stockholm: Natur & Kultur

Johannesson, H., Persson, J.-G., & Pettersson, D. (2013). *Produktutveckling : effektiva metoder för konstruktion och design*. Stockholm : Liber, 2013.

Mattsson. E. (2017, 18/8). *Här är 40 tjänster som underlättar din vardag*. Leva & Bo. Retrieved 2019-03-18 from <https://www.expressen.se/leva-och-bo/har-ar-40-tjanster-som-underlatter-din-vardag/>

MacArthur, E. (2013). Towards the circular economy. *Journal of Industrial Ecology*, 2, 23-44. Retrieved 2019-03-25 from http://circularfoundation.org/sites/default/files/tce_report1_2012.pdf

Meng-Mei, C., Murphy, H.C., Knecht, S. (2016). *An Importance Performance Analysis of smartphone applications for hotel chains*. *Journal of Hospitality and Tourism Management*, Vol 29, 69-79. <https://doi.org/10.1016/j.jhtm.2016.05.001>

Mobil. (2017). *Smartphone-ägare använder i snitt 9 appar om dagen*. Retrieved 2019-03-14 from <https://www.mobil.se/nyheter/smartphone-gare-anv-nder-i-snitt-9-appar-om-dagen>

Mobil. (2018). *Smidigare att använda appar än att surfa*. Retrieved 2019-03-14 from <https://www.mobil.se/partner/smidigare-att-anvanda-appar-an-att-surfa>

Mobil. (2018). *Appar*. Retrieved 2019-03-18 from <https://www.mobil.se/appar>

Myrorna. (2019). *Myrorna*. Retrieved 2019-03-13 from <https://www.myrorna.se/>

Naturskyddsföreningen. (2015). *Ägodela*. Stockholm: Bonnier Fakta

Population Matters. (2019). *Resources & consumption*. Retrieved 2019-05-07 from https://populationmatters.org/the-facts/resources-consumption?gclid=CjwKCAjw2cTmBRAVEiwA8YMgzQ1x_DJjF7mQ2sZla99yY0uZSdokkjvW7xrh-ZJ-wgYE0oKXqxFdYBoCHhcQAvD_BwE

Selvefors. A., Rexfelt. O., Renström. S. & Strömberg. H. (2019) *Use to use – A user perspective on product circularity*. *Journal of Cleaner Production*, 223, 1014-1028. doi: 10.1016/j.jclepro.2019.03.117

Statista. (n.d.). *App stores - Statistics & Facts*. Retrieved 2019-02-28 from <https://www.statista.com/topics/1729/app-stores/>

The balance. (2019). *The 7 Best Home Inventory Apps of 2019*. Retrieved 2019-03-18 from <https://www.thebalance.com/best-home-inventory-apps-4171940>

Think 360. (2016). *What Is Design Thinking and Design Thinking Process?* Retrieved 2019-05-07 from <https://think360studio.com/what-is-design-thinking-and-design-thinking-process/>

Tradera. (1999-2019). *Välkommen till Tradera – en av Nordens största marknadsplatser*. Retrieved 2019-03-10 from https://www.tradera.com/?gclid=CjwKCAjw1KLkBRBZEiwARzyE7w39qL-YMW70gPVWhrB_kEYSBQ3S6jfKZyAkhAi8yVpjfvLzDghmUhoCWUUQAvD_BwE.

Teknik i fokus. (2016). *Häng på nya trenden – sälj och köp via nya loppis-appen Shpock*. Retrieved 2019-03-10 from <https://www.teknikifokus.se/hang-pa-nya-trenden-salj-och-kop-via-nya-loppis-appen-shpock>.

USE2USE. (2019). *Exploring circular consumption journeys*. Retrieved 2019-03-29 from <http://www.use2use.se/?p=799>

Webster, K. (2015). *The circular economy: a wealth of flows*. Second edition.

APPENDIX

Appendix I

Guided Onboarding in phase 1

Appendix II

Phase 1: Survey on sorting habits

Appendix III

Analysis of the first user tests in phase 1

Appendix IV

Compilation from group user test & discussion in phase 1

Appendix V

Results of the first survey on how people organize and sort in their storages in (Phase 1)

Appendix VI

Phase 1: Priority list

Appendix VII

Survey: How do you consummate? In Phase 2

Appendix VIII

Analysis of the second survey on how people consumes in phase 2

Appendix IX

Different Sortapp users/members and examples of various scenarios in phase 2

Appendix X

Journey maps in phase 2

Appendix XI

Script for testing the Adobe XD prototype

Appendix XII

Analysis Adobe XD tests in phase 3

Appendix I

Guided Onboarding in phase 1

Comments from project group.

Timeline would have been preferred, strips or dots showing number of steps.

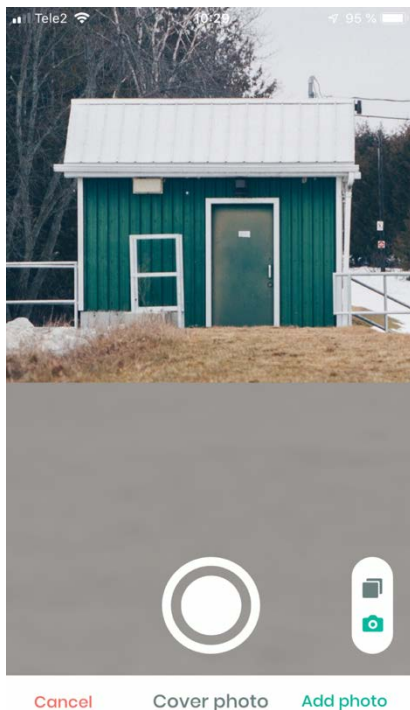
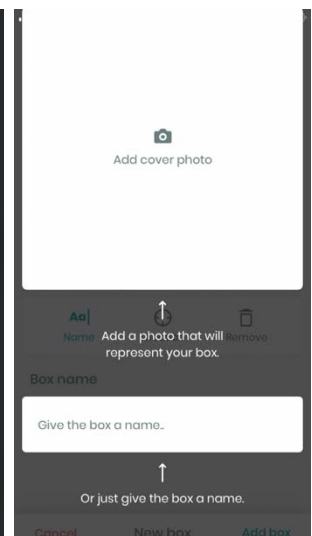
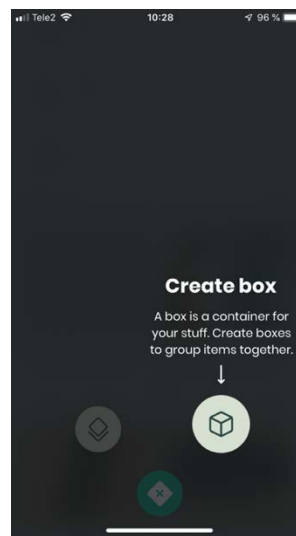
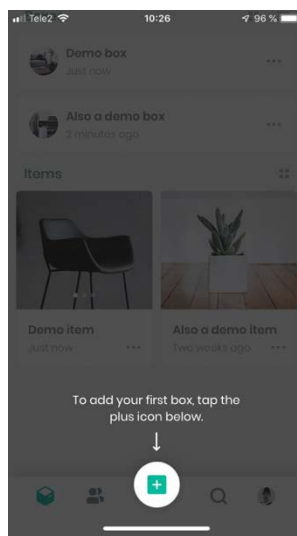
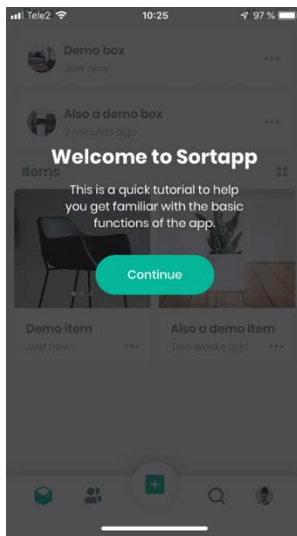
Make sure the junction/exit works.

1. Good

2. Good

3. Good

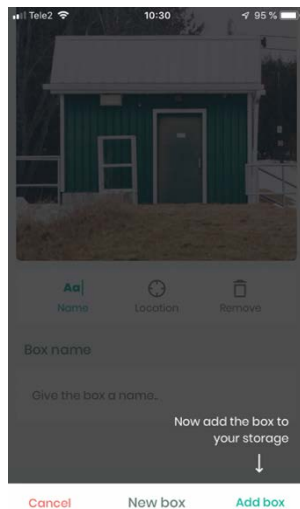
4. Good



5. Just highlight the photo button and the picture, the rest can fade when you cannot use them. Alternatively, that you fade everything except the icon to the right where you can make an arrow that you either use picture from the album or take picture. Thus, everyone knows how to use the camera, feels superfluous.

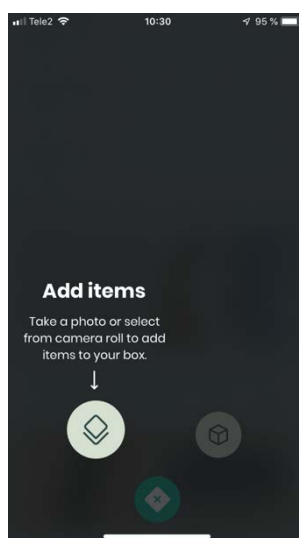
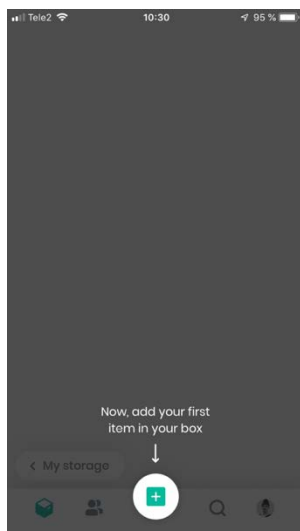
6. (+) Add a picture where it says that you can add info to the image you chose.

7. Good



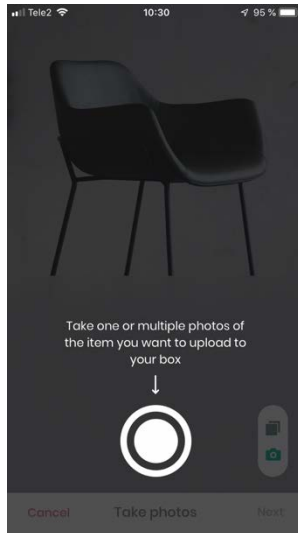
8. (+) A page that says that you created a box and tells you that you move on to next step.

9. Good



10. Only need to say add Add items - should only state that one should add one or more items in their box. Should be more like the previous explanations, similarly as in create a box.

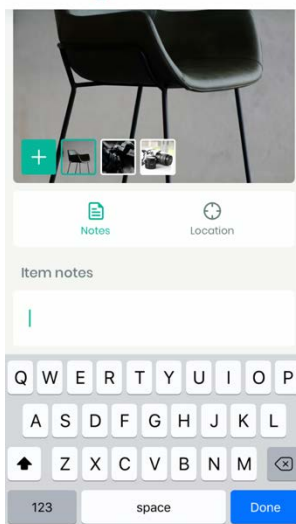
11. Pinpoint just as in step 4 only album or camera to the right and say you can multiple pict.



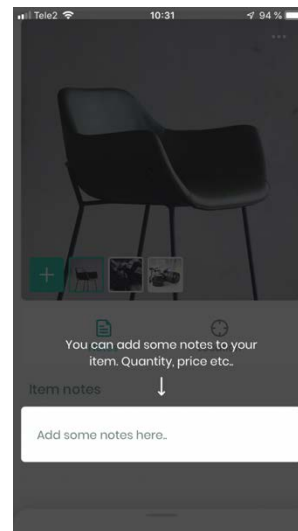
12. Do not get the picture - is the idea to focus of the three pictures available to choose or remove? It's still camera view or can you print the pictures and delete?



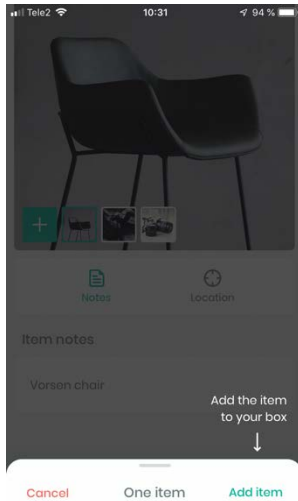
13. Good



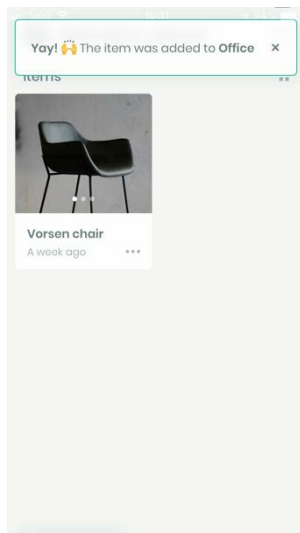
14. Good



15. One item? Maybe show that you can divide the pictures into separate items as well? Show pull up tab. Perhaps not having the opportunity to separate items while you are actually look at the pictures.



16. Good ending but clarify the note, maybe another color



Appendix II

Phase 1: Survey on sorting habits
(Completed in Swedish)

Frågor:

**Obligatorisk*

Kön *

Kvinna
Man
Annat

Ålder *

16-20
21-25
26-30
31-35
36-40
41-45
46-50
51-55
56-60
61 +

Boende *

Hus
Lägenhet
Korridor
Inneboende
Övrigt_____

Antal personer i hushåll *

1
2
3
4
5+

Finns barn i hushållet? *

Ja
Nej

Vad har du för utrymme att förvara outnyttjade saker? *

Vindsförråd
Garrageförråd
Källarförråd
Externt hyrförråd
Familj/släktingar
Inget
Övrigt_____

Har du ett organiserat förråd? *

Ja
Nej

Om ja: Hur har du organiserat?

Lådor (plast eller kartong)
Påsar
Hyllor
Högar
Möblerad inredning (byrå, garderob)
Listor
Bilder i telefonen/datorn
Övrigt_____

Hur hittar du bland dina saker? *

Hur ofta behöver du hämta saker från ditt förråd? *

1 ggr/veckan
1 ggr/månad
1 ggr/kvartal
1 ggr/halvår
1 ggr/år
mer sällan

Känns det som en jobbig process att ta sig till förrådet? *

Ja

Nej

Om ja: Varför?

Avstånd

Lathet

Trappor

Svårt att hitta bland saker

Övrigt_____

Hade du velat ha en digital översikt av ditt förråd? *

Nej, jag går gärna dit och kollar själv

Ja på telefonen

Ja på datorn

Övrigt_____

https://docs.google.com/forms/d/e/1FAIpQLSe3AF5X8G-JWDTBfEWcfD9gKLPUYUPsgdXdRzuXPC89ZuYaFw/viewform?usp=sf_link

Appendix III

Analysis of the first user tests in phase 1

- A welcome text should be available when you have created an account.
- There should be a "homepage" that is not My Storage but is showing a list of all the storage you own.
- The box symbol is unclear, think you are inside a box but really you are in storage...
- You automatically end up in a storage when you log in, you can end up in any storage, very unclear.
- One needs notices when others edit one's own storage.
- Unclear who to share storage with.
- You should accept if you want to share a box with someone else. One does not want to share with the wrong people. And you don't want to get someone else's box/storage ...
- Many presses the image to edit the text/notes when they are new (don't understand single/separate)
- The separation of items should occur when giving the pictures different names. If same name = same item.
- When creating a box, it says new box at the bottom of the screen is unclear whether to add one or create new... should be consistent.
- Older iPhone = text touching each other.
- Within edit and settings, the delete symbol is unclear, should be the same as inside the items (remove symbol).
- Too many different ways to move, edit, and delete items.
- Unable to change name inside your profile.
- Cannot move boxes between storages.
- No confirmation that images are being loaded.
- No one understands single/separate items.
- Want to be able to name an item with multiple pictures and different names. ex up, down, front, back.

- Many creates a box firstly, then want to add an item to the box but often it ends up in storage. unclear that you are in storage... (because of the box in the left corner).
- Back-arrow when filling in its name and password on log-in, covers the text box.
- When the app is loaded for installation, many want to push the dots, think they themselves should check the process.
- When you click on the location it is not visible because it is behind the keyboard.
- Unclear with what function location has, some wanted to create their own/new location.
- Many people confuse storage for box (due to the box in the left corner).

Appendix IV

Compilation from group user test & discussion in phase 1

SHARING

- Difficult to understand that (+) is to share with someone, another symbol would be better for example a friend's symbol.
- Cannot search for other people but send invite should be relevant at a valid name/mail.
- Unclear how I will proceed when I printed a person to share.
- Difficult to find sharing, need confirmation that the person is added.
- Unclear that one should have to go into settings to be able to share with others.

CREATE BOX

- Location was very fuzzy, is it a map??
- Add box and new box, one should be consistent...
- When taking a photo, it should stay on the big screen, you don't really understand where the picture goes or if it is good enough.
- Time consuming to upload images.
- Unclear that one can create multiple boxes.
- Want to be able to move boxes with drag and drop!

MY STORAGE

- What does square + checkmark mean? Should be clear/checked but it shows some adjustment feature, do not understand purpose until you click on it.
- Don't understand that it is possible to do multiple storages.
- Should start by creating a storage, late box, last item ...

INSTALLATION

- Installation activity unclear...? Wait or check? What should I do?
- "Create account" and "next" appear simultaneously, should create account before "next" activated.

ITEM

- Missed pressing the add item button and the picture disappeared, no confirmation of what had happened, more feedback.
- When taking a photo, it should stay on the big screen, you don't really understand where the picture goes or if it is good enough. Do not understand that you can take several pictures at the same time on different items or several pictures on the same item.
- Seperate item & single item, fuzzy no one grasps.
- When you press the image, you have taken you want to add a note, but all the pictures get the same notes (cannot find separate item).

OTHER

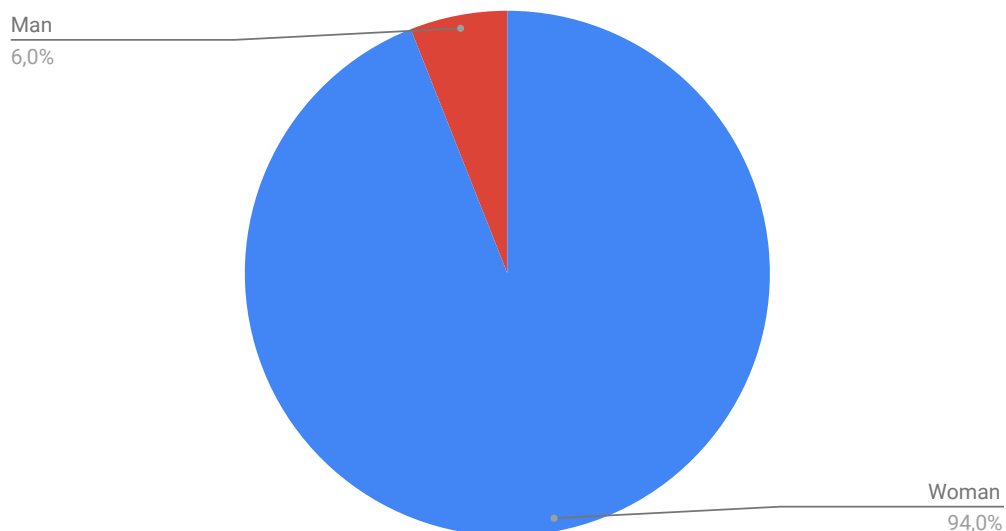
- Move button has an unclear purpose, want to be able to drag- drag and drop function!
- More feedback along the way.

Appendix V

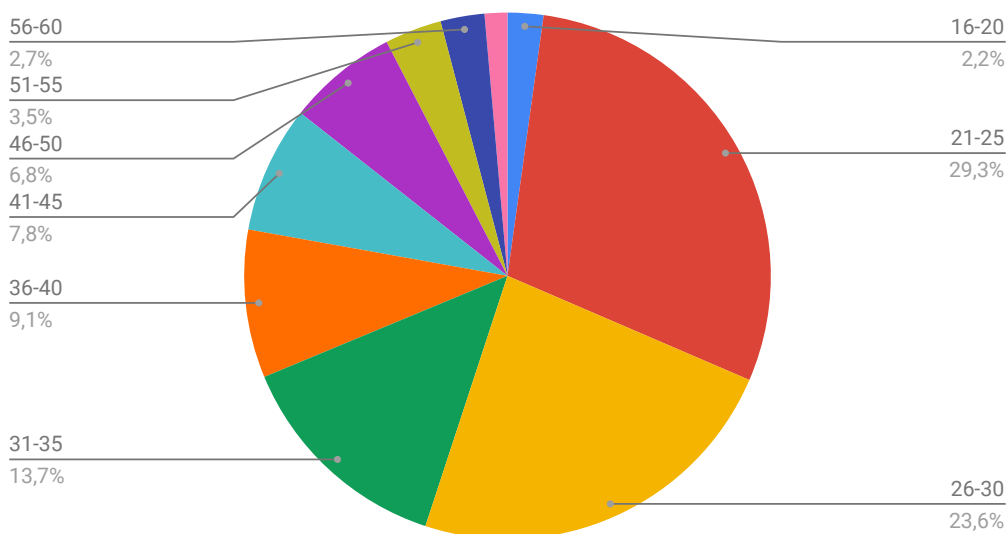
Results of the first survey on how people organize and sort in their storages in (Phase 1)

(864 answers)

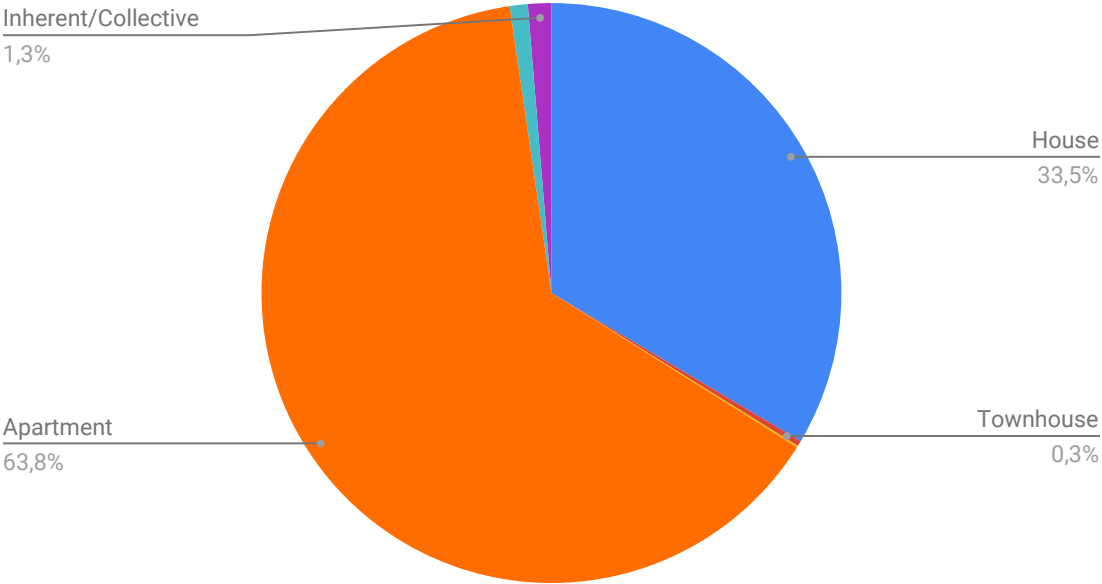
Gender



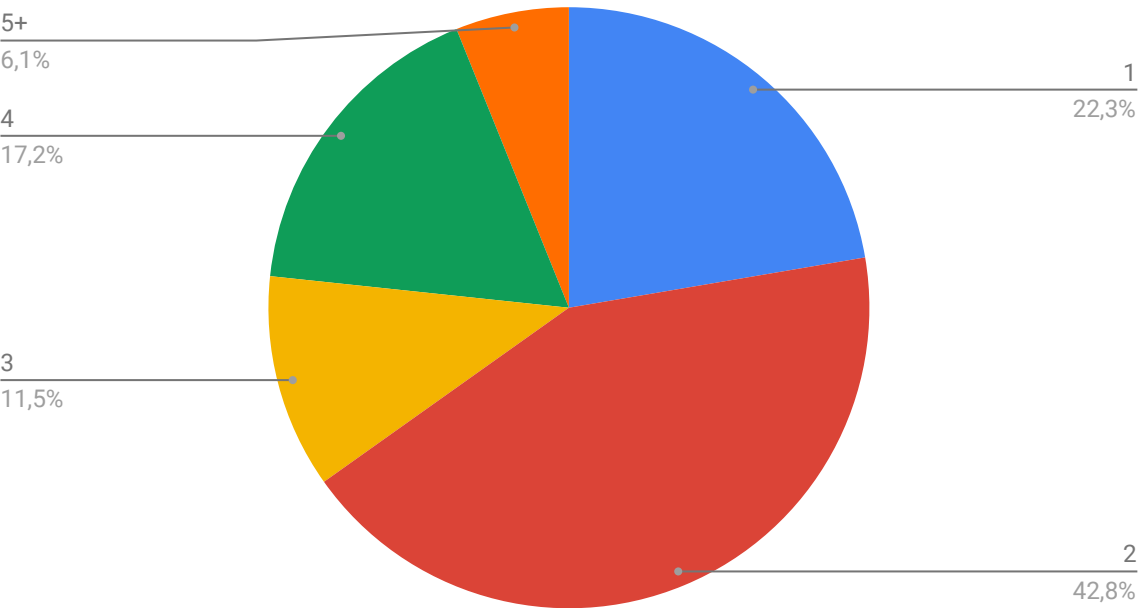
Age



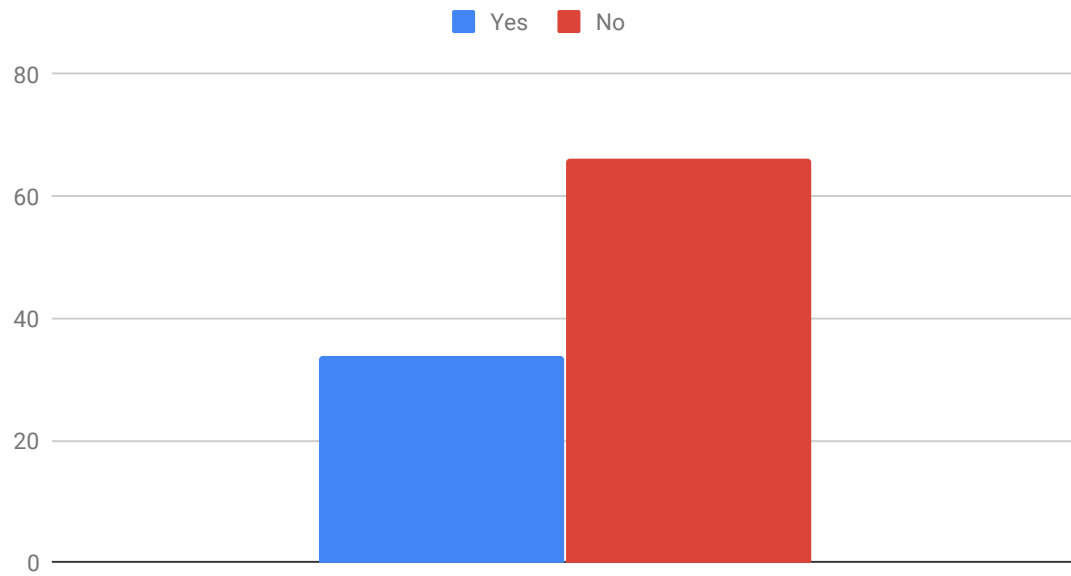
Accomodation



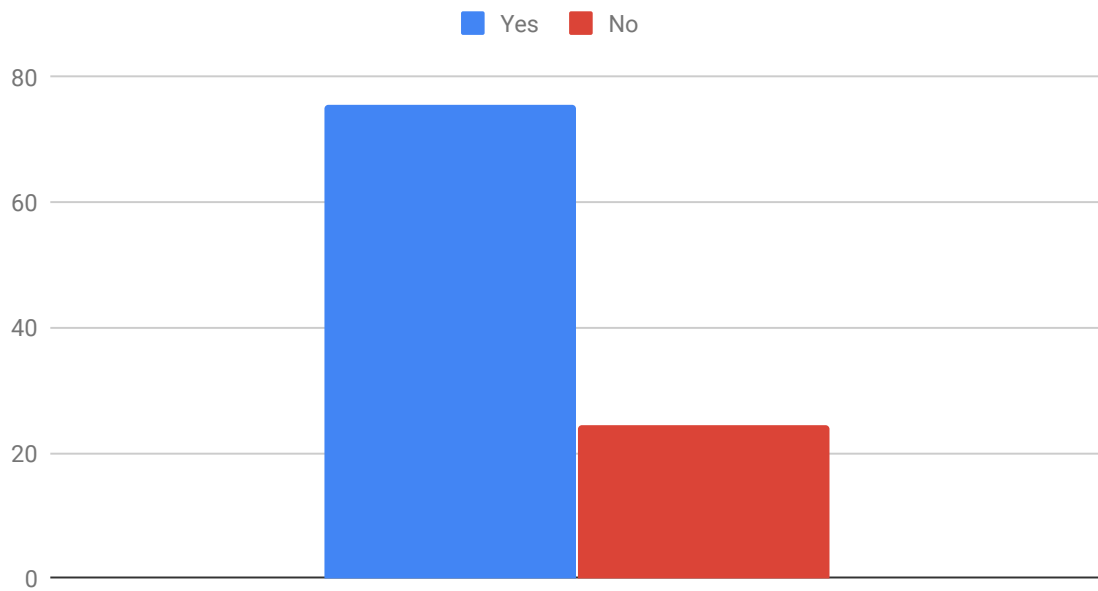
Number of people in household?



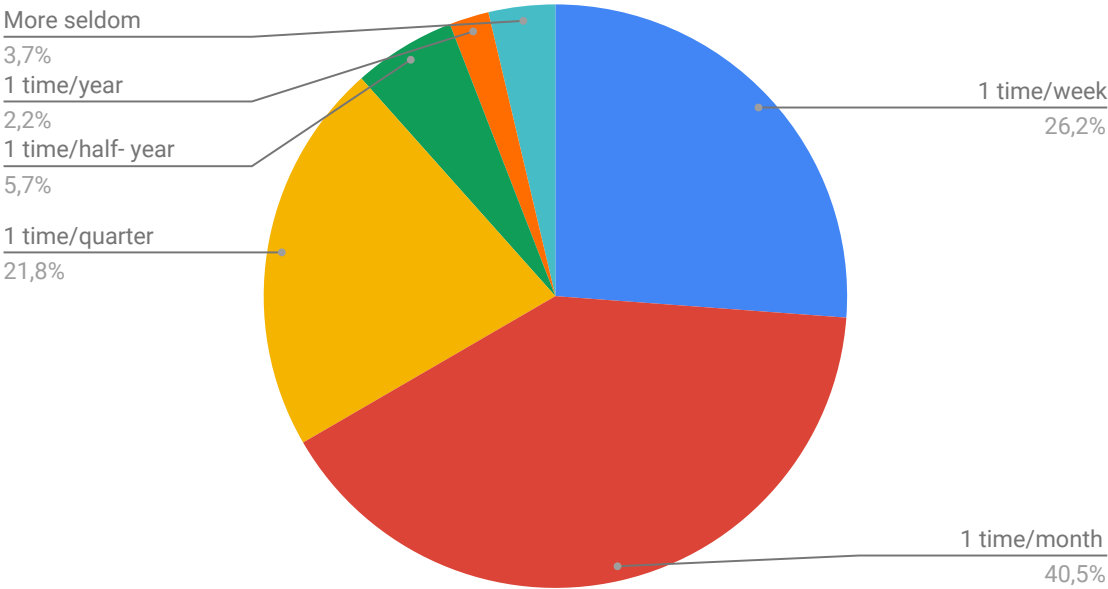
Do you have kids?



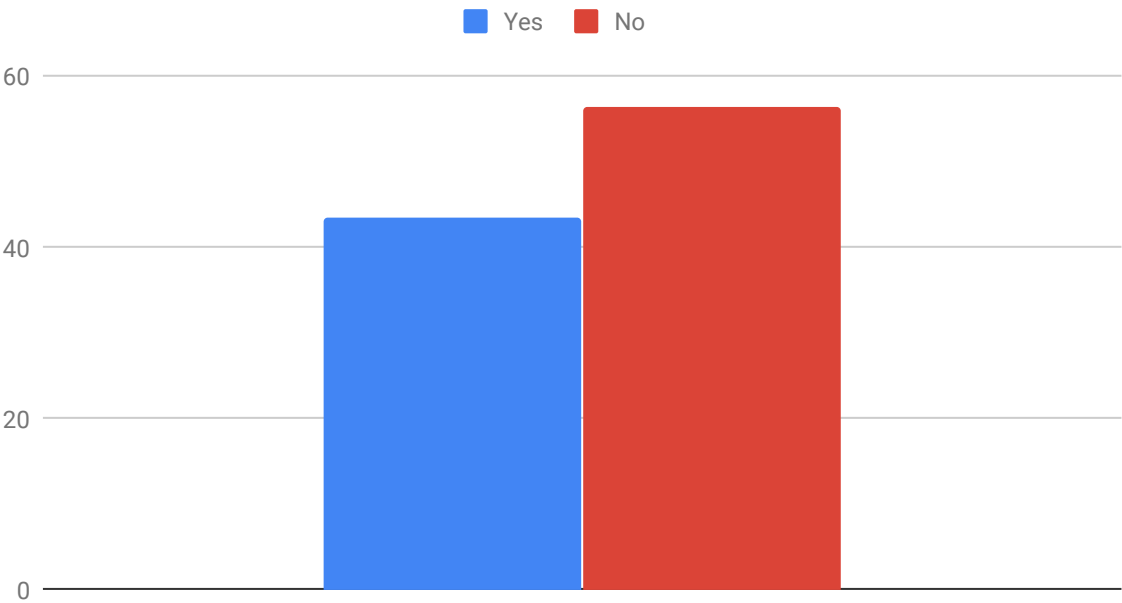
Do you have an organized storage?



How often do you need to retrieve things from your storage?



Does it feel like a difficult process to get to the storage?



How do you find your stuff?

Looking / Roots (approx. 130)

Plastic boxes / transparent (approx. 50)

Memory (approx. 250)

Marked boxes in some way (approx. 250)

What do you have room to store unused things?

Basement 58%

Find 35%

Garage 23%

Family / Relatives 22%

External rental storage 4%

If yes: How have you organized?

Boxes (plastic, cardboard) 93%

Shelves 70%

Furnished furnishings (wardrobe, chest of drawers etc.) 29%

Bags 28%

Highs 13%

Lists 4%

If yes: Why does it feel like a difficult process to get to the store?

Laid 56%

Hard to find 33%

Stairs 26%

Distance 20%

Scary, dark, spiders, crowded, cold, too much stuff etc.

Did you want a digital overview of your store?

(859 responses)

51.5%: no, I'm happy to check myself

36.4%: yes, on the phone

11.8%: yes, on the phone

Other comments:

- svårt att dokumentera allt, många småprylar
- inget jag känner att jag saknar idag, men är det smidigt och inte kräver för mycket jobb så absolut!
- svårt att komma ihåg att uppdatera, skulle snabbt bli inaktuell.
- jag har bra koll men hade det hjälpt att optimera utrymmet hade jag kunnat tänka mig att använda det.
- om katalogisering var smidig ja, hade inte orkat inventera alla mina grejer idag.
- hade varit mer jobb att lägga in grejer än vad det ger i slutändan.
- om jag hade haft mycket saker hade det underlättat.
- känns som mer jobb att skapa översikten än vad det sparar i tid.
- då behöver man skanna in och ut alla prylar, ännu en grej att hantera.
- Nice med bevakning om något blir **stulet**.
- ibland blir jag osäker om jag tex lagt en blomkruka i förrådet eller i ett skåp i lägenheten.
- få lite organiseringstips för att **platseffektivisera**.
- viktigt att kunna dela med andra.
- översikt över matskafferier.
- **övervakning** vid översvämning eller inbrott.
- känns som ett **överflödigt** steg att behöva **uppdatera hela tiden**.
- har så pass **lite saker**, hittar bra än så länge.
- för **mycket att fixa**, har så mycket skit skulle ta dagar att skriva ned allt.
- har inte behov, men kanske framöver.
- om det inte behöver underhållas och blir en **extra syssla** och därmed **jobbigare** än att bara gå dit och kolla.
- i framtiden kanske, har så **få grejer** har allt i huvudet. hämtar grejer så sällan och det är basically två lådor med säsongskläder/dekorationer.
- skulle inte orka hålla den **uppdaterad**.
- Hade nog velat ha det på allt, men blir ett så fruktansvärt **stort projekt** att skriva in det så **avskräckas** av det.
- gillar inte skärmar.
- kanske ha någon bra förvaringsprodukt istället för lådor. eller digitala lådor med en app som översikt.
- har inte så mycket saker skulle inte va så givande. skulle nog snarare tycka det vore ytterligare en sak att **behöva ordna med. hålla nere mängden oanvända saker** är det viktigaste.
- det känns spontant som ett **omständligt jobb** att föra in all information till ett sådant system. men skulle nog kunna **underlätta**.
- har inte så mycket.
- om jag slipper all de administrativa uppgifterna för att få det att fungera.
- bara om den **uppdateras automatisk**, då jag delar den förrådet med en som inte uppdaterar såna listor.

- har redan det på sätt och vis, går förstås att **förbättra**.
- inte en övervakande kamera mer ett dokument på vad som finns och vart.
- arbetet att registrera innehållet och gå igenom vad vi har skulle ta alldeles för lång tid som isf skulle bättre kunna **användas för att rensa**.
- beror på hur **mycket jobb** som krävs.
- beror helt på hur den är **utformad**. i dagsläget nej, men om den imponerar, absolut.
- känns som det **kräver mycket** förberedelser.
- otroligt **smidigt** att ha en digital karta över vad du har för framtida försäljning.
- ja en digital tvilling, perfekt att **hålla koll** på storlekar etc.
- Låter jobbigt att **uppdatera** en digital lista.
- hade föredragit hjälp med riktigt bra och **logisk ordning** där saker är väl uppmärkta i själva förrådet. om det fanns en **digital planeringstjänst** som kunde underlätta så ja.
- det kanske hade varit bra, men hade nog haft svårt att **uppdatera** den.
- ja för att **visualisera** för min dotter.
- ja så länge inte sin **integritet** bryts genom en 3e part tar del av data, dvs gdpr osv.
- om det inte krävs att jag **behöver lägga ner mycket tid innan** jag får en digital översikt.
- hade jag haft längre **avstånd** till förrådet så ja.
- beror på hur det ser ut. men tycker inte att jag sparar så mycket. har dessutom gott om utrymme nu så det är rätt lätt överskådat.
- vissa mer långtids förvaringar.
- för oss angelägna att **slänga** än att organisera...
- översikt är aldrig fel, men av lathet skulle jag aldrig lägga tiden på att fota mina grejer och sedan orka checka in/ut grejerna i förrådet. om inte AI skulle kunna kategorisera utifrån ett foto från en kamera installerad i taket som sedan kan hålla lagersaldot uppdaterat.
- om jag hade haft mer grejer.
- har inte så mycket.
- skulle inte funka för mig pga stökigt.
- om det vore lätt att använda/registrera.
- har inte tillräckligt mycket saker ännu för att inte kunna hålla koll.
- förrådet känns inte tillräckligt stort för att behöva hålla koll.
- målet är att rensa så mycket som möjligt så att det blir enklare att hitta.
- ja om det även var sorterat i själva förrådet. för problemet är att hitta, jag vet vad som finns.
- hade jag haft ett externt förråd ja.
- hade funkad om det ingick in hyreskontraktet, men inget jag själv skulle anstränga mig att skaffa.

CONCLUSION

- Many people feel that it can be a lot of work, difficult and demanding to document.
- Demanding to update the storage.
- They feel no need due to few owned things.
- Good for controlling the storage, for theft, if there is a flood/fire (insurance).
- Good for being able to sell, realizing that you have a lot of stuff (consumption).

Appendix VI

Phase 1: Priority list

Based on user test 1 and user test in group

1. Main menu

Important to clarify for users that one can create multiple storages. That you get a list of all of your own storages when you open the app. Better overview -> better understanding of how the app/functions are arranged. The box icon in the left corner should clarify that you are in a storage and not a box.

(Comments - Participants)

- Don't understand that you can do multiple storage.
- Should start by creating a storage, thereafter box, lastly item...
- Many people misunderstand storage as a box (due to the box in the left corner).
- The box symbol is unclear, you think you are in a box but instead you are in storage...
- You automatically end up in a storage when you log in, you can end up in any sort of storage (my own or somebody else's), unclear.
- Many create a box, then want to add an item to the box but often it ends up in Storage. It is unclear that you are in storage... (because of the box in the left corner).
- A welcoming text should be available when you have created an account.
- There should be a "homepage" that is not My Storage, showing a list of all the storage you own.

2. Feedback

Notifications when sharing, eg when one has shared a box with others, there should be a confirmation that sharing has been completed. Accept/Decline sharing with others. Notices when editing something. Security message upon canceling. Image upload confirmation. Visually clearer installation process (ticks). At create account, next should light up when the fields are filled.

(Comment - Participants)

- More feedback along the way.
- Unclear how to move forward when I have chosen a person to share with.
- Hard to find the share function. Need some confirmation that the person is added.
- Installation activity unclear ...? wait or check? what should I do?
- Time consuming to upload photos.
- Create account and next are displayed simultaneously, should create account before next symbol get activated.

- Failed to press add item and the picture disappeared, no confirmation of what had happened. More feedback.
- When the app is getting installed, many want to press on the three dots, they think themselves should check the process.
- No confirmation that images are being loaded.
- One needs notices when others edit one's own storage.
- Unclear who I share storage with.
- You should be able to accept if you want to share a box with someone else. One does not want to share with the wrong people. And you don't want to get someone's box / storage ... Equally as with storages and items.

3. Single/Separate Item

Unclear function. Many people miss that one item can be divided into several items. In the first step of add *item* - use larger images so that the user can determine in this page whether the image they have taken is good/bad.

(Comments - Participants)

- No one understands single/separate items.
- Want to be able to name one item with multiple pictures and different names. for example; up, down, front, back.
- Separate item single item, sill-fuzzy no one grasps.
- Many tap the image to edit the text/notes when they are new. (don't understand single/separate)
- When you tap the image, you have taken you want to change the name, but all the pictures get the same name. (cannot find separate item)
- When taking a photo, it should stay on the bigger screen, you don't really understand where the picture goes **or** if the picture gets good. They do not understand that you can take several pictures at the same time on different items or several pictures on the same item.

4. Symboler/features

Symbols in need of clarification.

Location- Clarify location, what the symbol means and what it should be used for. Maybe another symbol than one that you are used to seeing in map context.

(Comments - Participants)

- Location was **very** unclear, map??
- When you click on the location it is not visible because it is behind the poppin keyboard.
- Unclear with what the location function are used for, some wanted to create their own/new location.

Sharing- The function is hard to find and is somewhat unclear.

(Comments - Participants)

- Difficult to understand that (+) means to share with someone, another symbol would be better for example; friends' symbol.
- Unclear that one should have to go into settings to be able to share with others.

Adjustments

(Comments - Participants)

- What does square + tick mean? Should be ready/checked out but show someone's adjustment feature. Do not understand purpose until you click on it.

Move

(Comments - Participants)

- Move button has an unclear purpose, want to be able to drag!!! Drag and drop function...
- Want to be able to move boxes with drag and drop!
- To many different ways to move, edit, and delete items.

Delete

(Comments - Participants)

- Inside edit and settings, the delete symbol is unclear, should be the same as inside the items (remove symbol).

5. Be consistent

(Comments - Participants)

Add box and new box, one should be consistent.

Unclear that you can create multiple boxes.

When creating a box, the new box at the bottom of the screen is unclear whether add or new... should be consistent.

Bugs

(Comments - Participants)

Older iPhone = text touching each other.

The back arrow covers when filling in your name and password at login page.

Unable to change name inside your profile.

Unable to move boxes between storage.

Can't search on other people but send invite should be considered if the person has a valid name/email.

Appendix VII

Survey: How do you consummate? In Phase 2

Questions:

Kön

Kvinna Man

Annat

6+

Ålder

16–20

21–25

26–30

31–35

36–40

41–45

46–50

46–50

51–55

56–60

61+

Bor du i en större stad?

Ja

Nej

Om ja, vilken stad och stadsdel?

Om nej, skriv X.

Hur intresserad är du av klimatfrågor?

You can select multiple options.

Inte särskilt

Medveten/tänker på det

Aktivt intresserad (läser artiklar etc.)

Är med i Facebook-grupper

Aktiv i organisationer/föreningar

Går på klimatmöten/träffar

Har du barn?

Ja

Nej

Vad gör du hemma för att stötta miljön?

You can select multiple options.

Källsorterar

Minskat köttkonsumtion

Vegetarian/Vegan

Köper/Säljer second hand

Minimerar flygresor/år

Delar/lånar ut prylar

Minimera matsvinn

Köper ekologiskt/närodlat Inget

Boende

Hus

Radhus

Lägenhet

Korridor

Inneboende/Kollektiv

Annat

Antal personer i hushåll

1

2

3

4

5

Hur tar du dig till jobb/skola?

You can select multiple options.

Går

Cyklar

Kollektivt
Bil
Bil pool

Vad kan du tänka dig att köpa second hand?

You can select multiple options.

Inget
Bil
Köksredskap
Kläder
Leksaker
Verktyg
Möbler
Teknik
Böcker
Sängkläder/handdukar
Sportutrustning
Allt

Jag kan tänka mig att låna en skidjacka av...

You can select multiple options.

Ingen
Kompis
Familj/släkt
Kollega
Grannen
Uthyrningsföretag
Vem som helst

Jag kan tänka mig att låna ut en skidjacka till...

You can select multiple options.

Ingen
Kompis
Familj/släkt

Kollega
Grannen
Uthyrningsföretag
Vem som helst

Vad skulle du kunna tänka dig att låna ut?

You can select multiple options.

Inget
Boende (Airbnb)
Bil
Sportutrustning
Verktyg
Kläder
Leksaker
Teknikprylar
Böcker
Sängkläder/handdukar
Möbler
Köksredskap
Allt

Vad får dig att inte vilja dela prylar?

You can select multiple options.

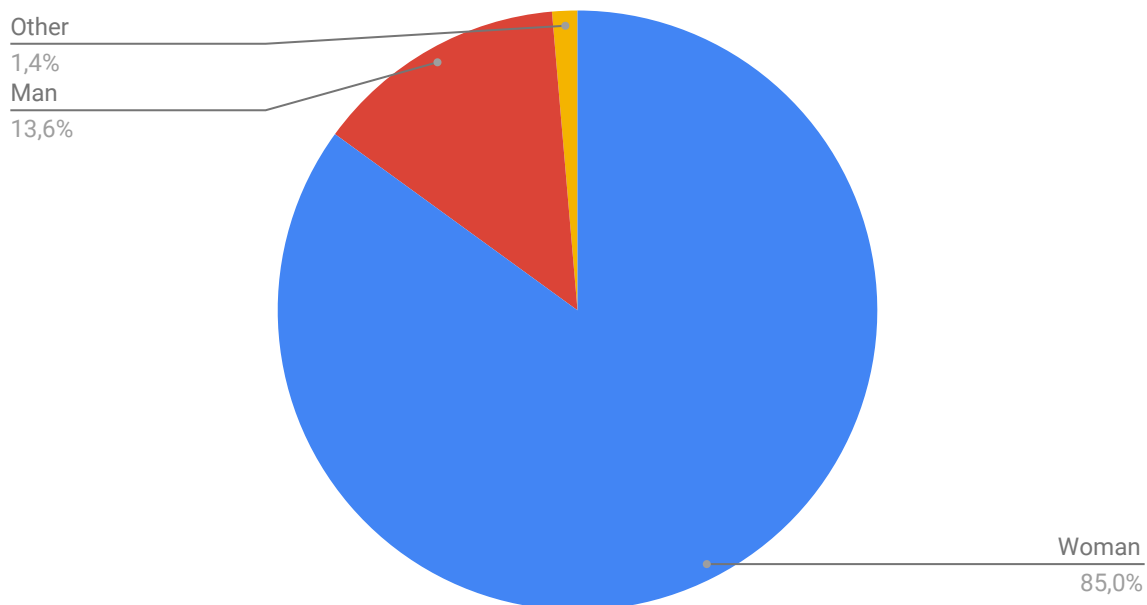
Omständligt
Ohygieniskt
Tidskrävande
Litar inte på andra
Mina prylar har ett ägandevärde (fäst vid produkt)
Produkten slits
Avstånd (geografiskt)

Om du delar prylar med andra hur gör du?

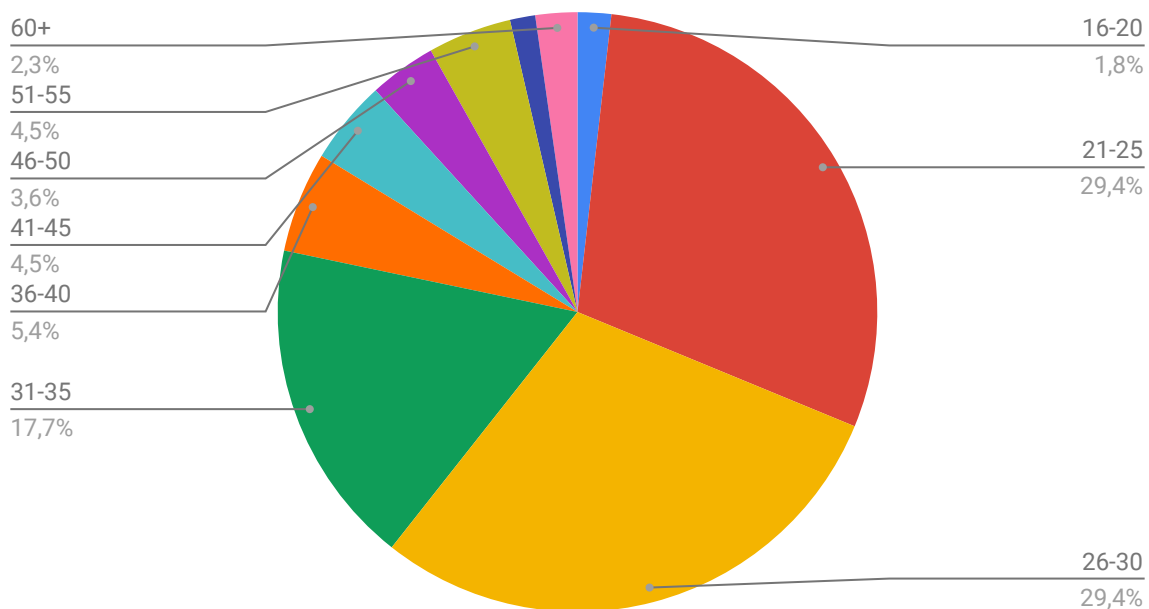
Appendix VIII

Analysis of the second survey on how people consumes in phase 2

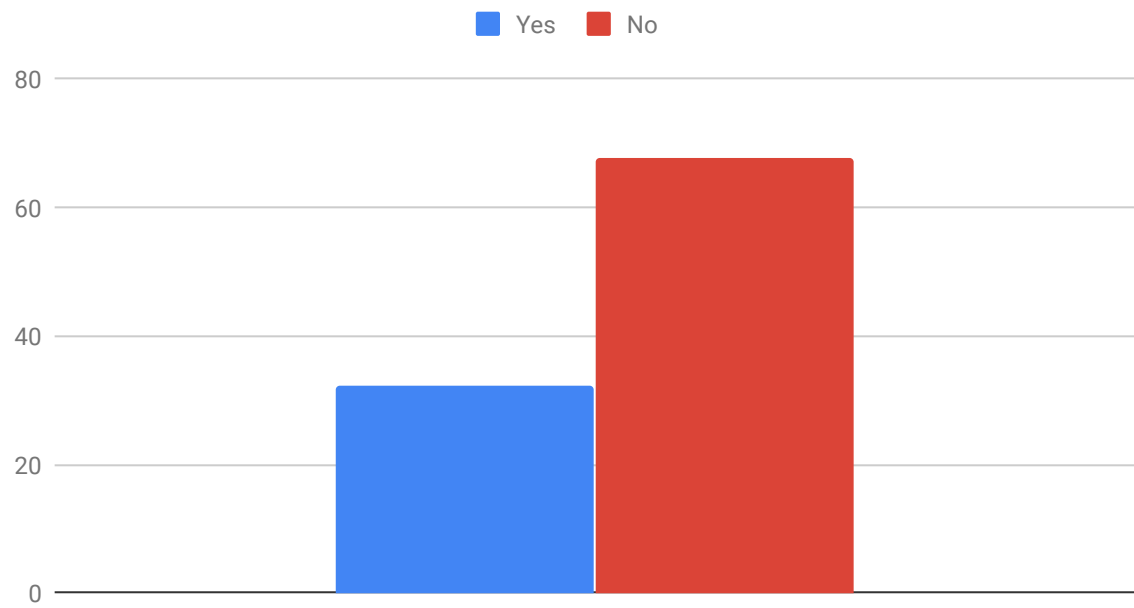
Gender



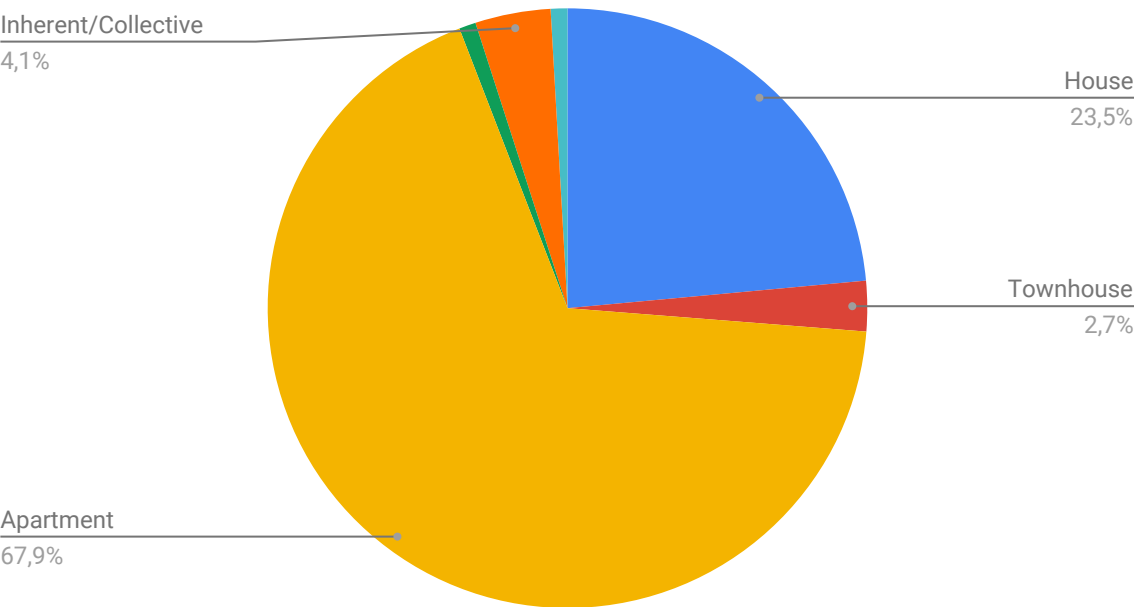
Age



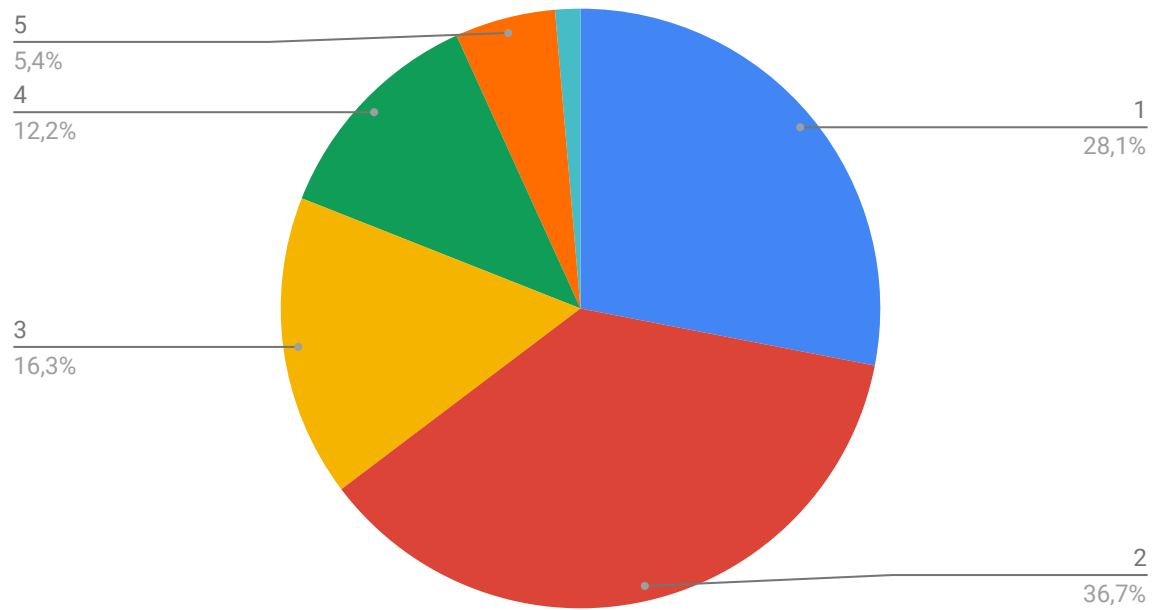
Do you have kids?



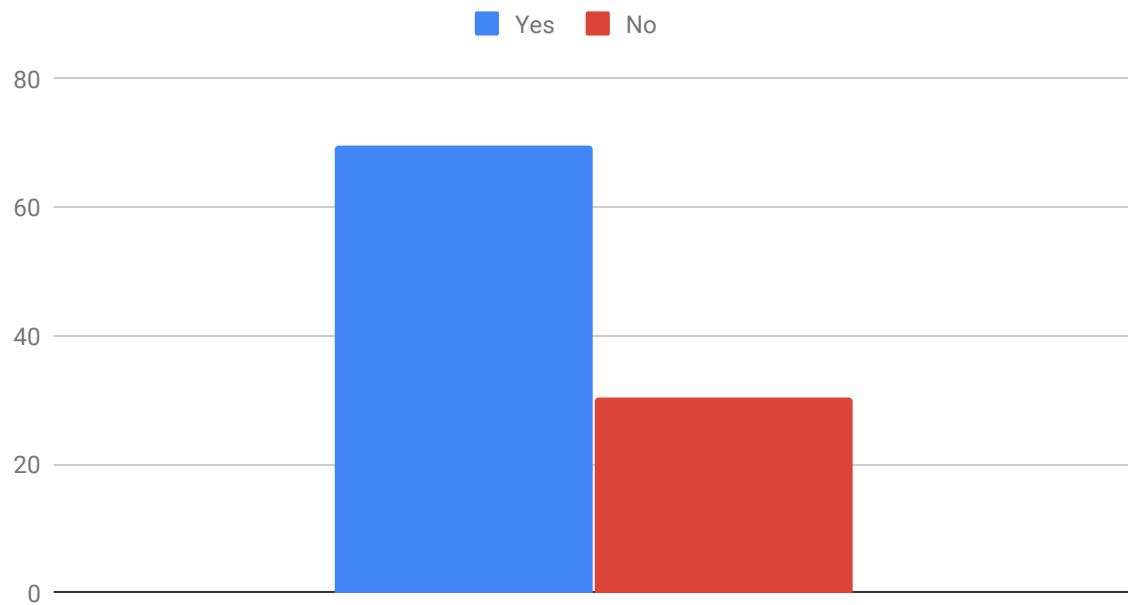
Accommodation



Number of people in the household



Do you live in a "Big city"?



Göteborg

Majorna 7
Tolered 2
Biskopsgården 1
Lundby 6
Kville 2
Askim 2
Frölunda 6
Johanneberg 10
Olskroken 2
Guldheden 5
Stampen 3
Örgryte 3
Linnéstaden 2
Angered 2
Kortedala 2

Högsbo 3
Lunden 3
Krokslätt 2
Centrum 2
Kungsladugård 2
Flatås 1
Strömmensberg 1
Agnesberg 1
Masthugget 1
Kungshöjd 1
Lorensberg 1
Kärrdalen 1
Kyrkbyn 1
Kviberg 1
Tuve 1
Utby 1

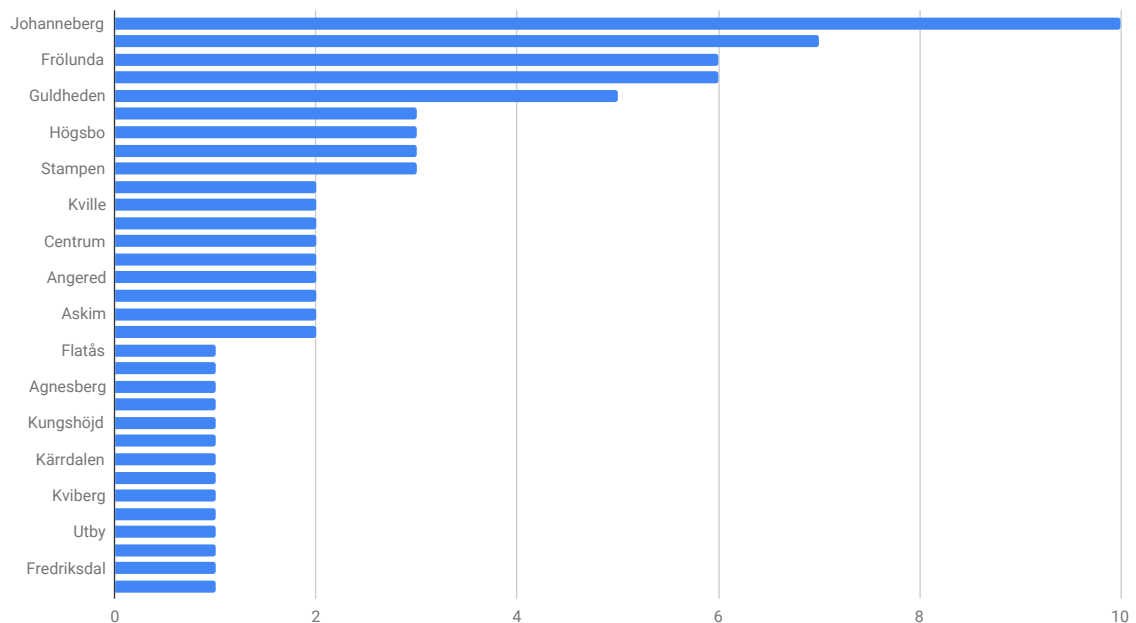
Backa 1
Fredriksdal 1

Other

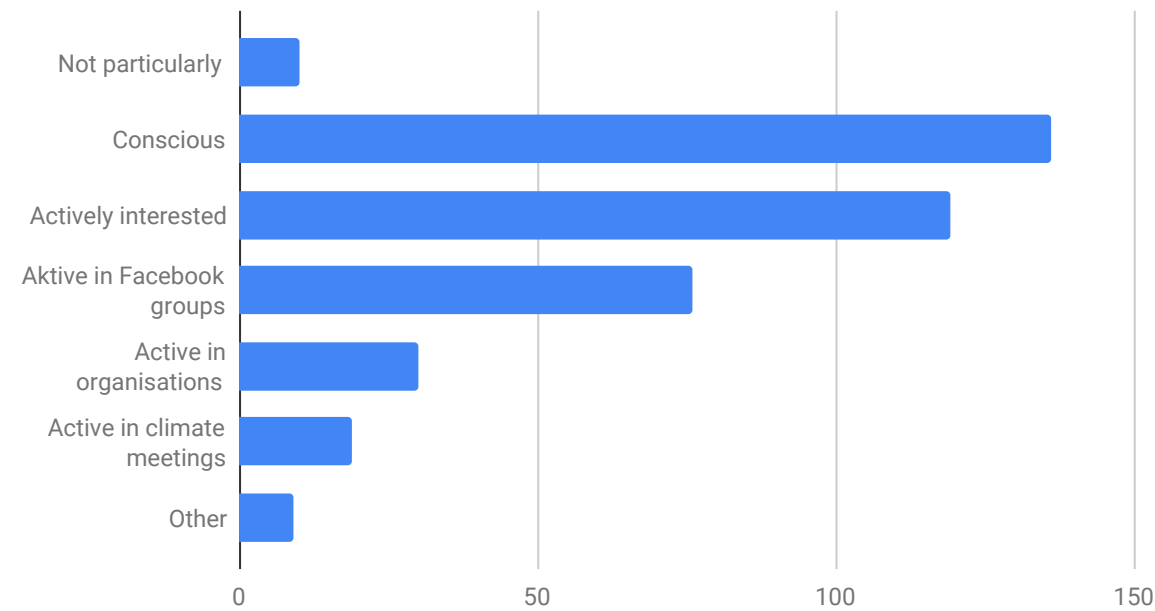
Stockholm 26
Malmö 13
Uppsala 5
Norrköping 3
Umeå 2

Eskilstuna, Norr
Helsingborg
Borås. Hestra.
Sundsvall
Lund, annehem
Luleå
Visby

Neighborhoods in Gothenburg represented

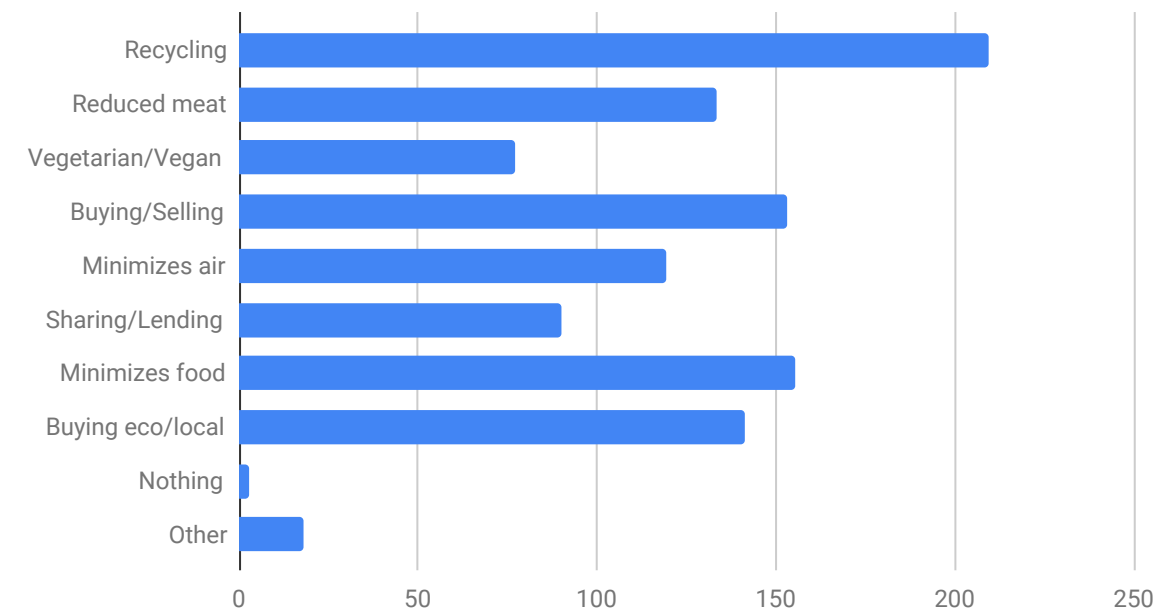


How interested are you in the climate issues?

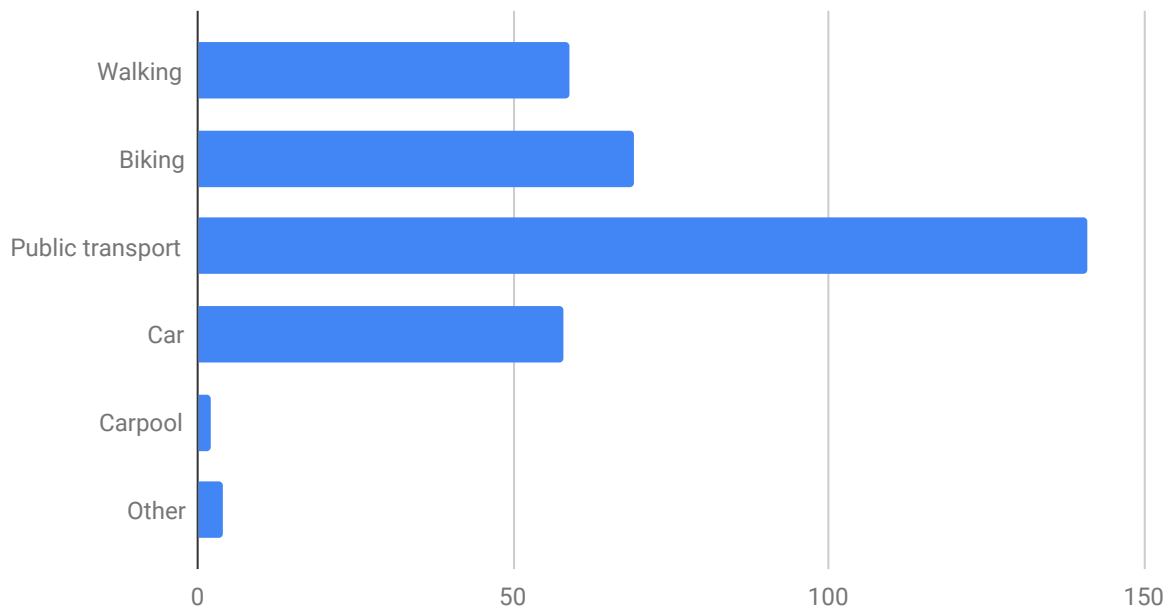


Summary: 90 out of 221 parts / lends gadgets.

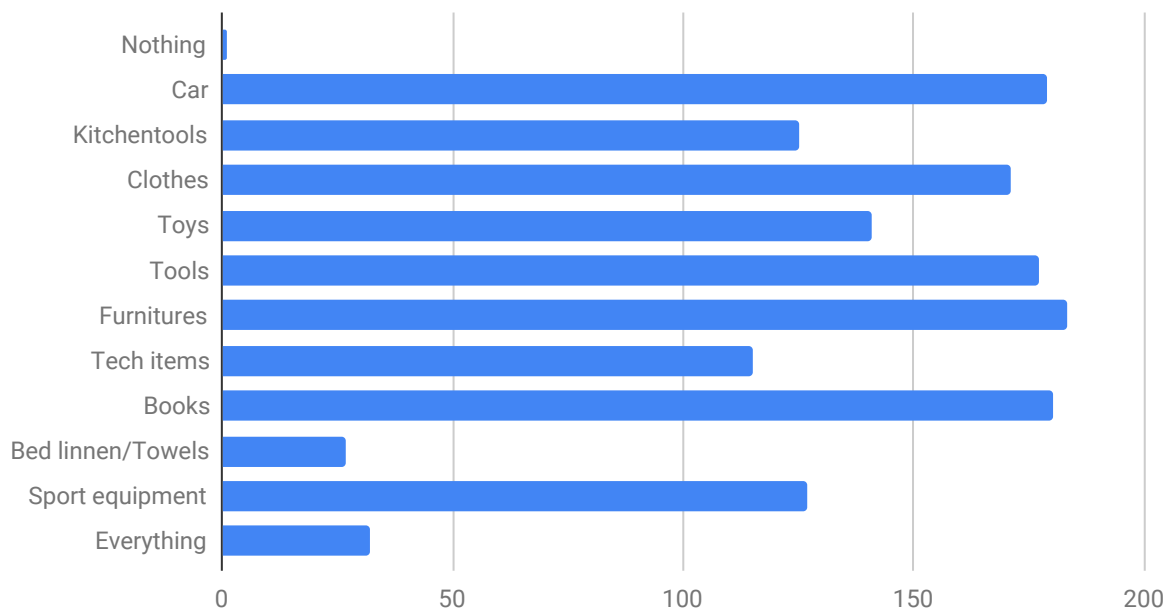
What do you do at home to support the environment?



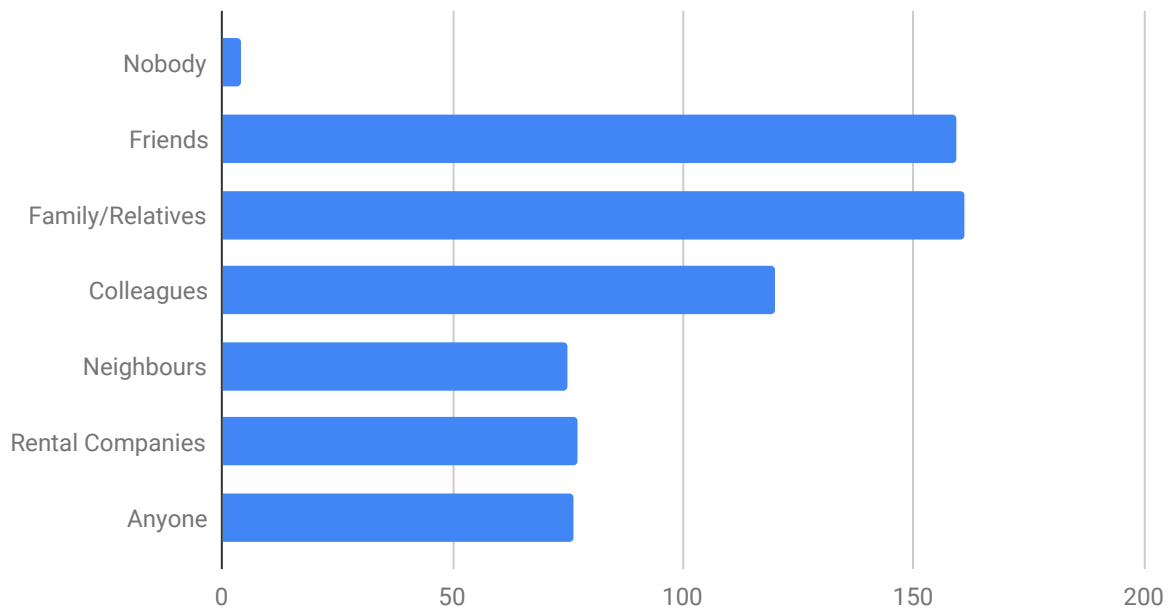
How do you get to and from work/school?



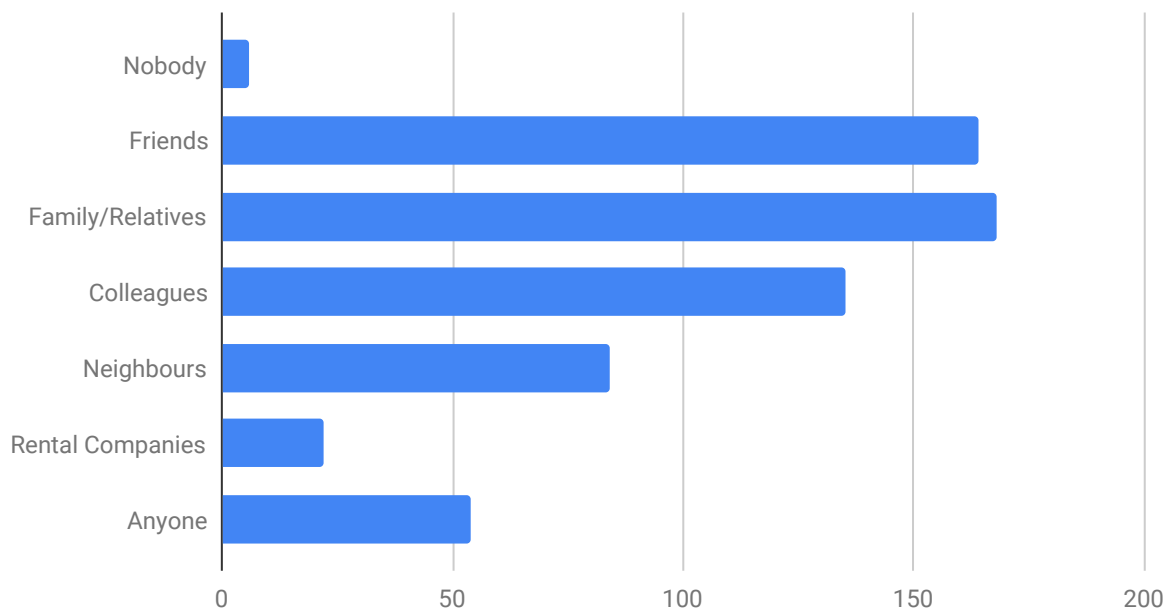
What can you imagine buying second hand?



I can think of borrowing a ski jacket from ...

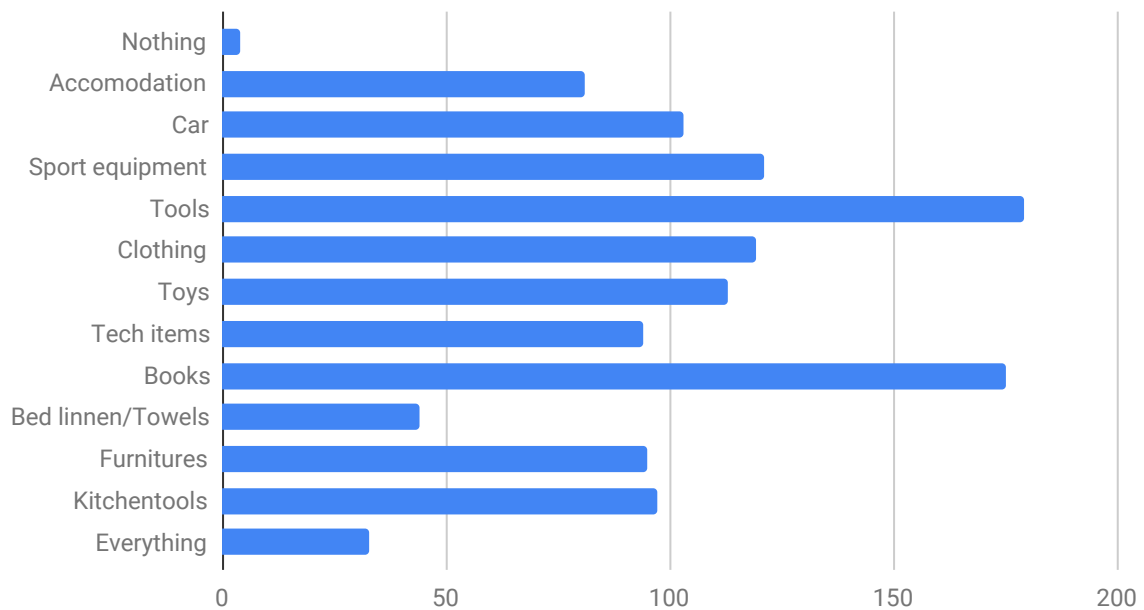


I can think of lending a ski jacket to ...

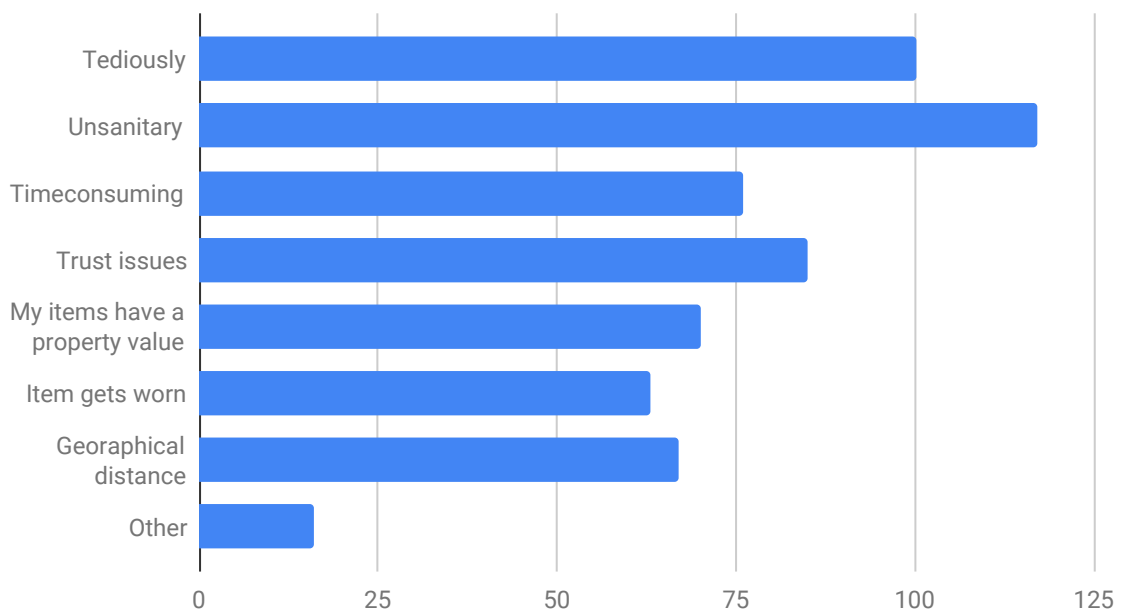


Summary: You can borrow out for family / friends. Of unknown, you are happy to borrow.

What things can you think of lending out?



What makes you not want to share items?



If you share items with others how do you do?

Number of responses: 75

Based on the answers below, most people share with family, relatives, friends when something is requested, some people also borrows for neighbors and acquaintances. Asking for loans seems to be a bigger threshold than asking to borrow yourself, since you often have to ask around to find what you are looking for. Facebook is something

that is also used extensively for the purpose. Borrowing with people close by feels better as it becomes easier to lend and return the items.

Interesting quotes

"Delar gärna med dem i min närhet. Dels för att jag litar på att de tar väl hand om grejen när vi har en relation, dels för att det är enkelt då vi lätt ses. Har sett att det finns appar för att dela prylar men har inte gått med i något ännu. Kanske lite pga. att jag är introvert att jag har svårt för kontakt med nya människor"

"Jag brukar skänka bort urvuxna kläder och leksaker. Har nyligen tömt mitt föräldrahem, och då skänkte vi bort delar av bohaget. Lånar gärna ut bilen till vänner och anhöriga. Delar på vissa resurser inom bostadsrättsföreningen, t ex redskap och verktyg."

"Kompisar lånar kläder spontant osv, vet inte riktigt mer vad jag lånar ut..."

"Lånar ibland ut saker till grannar när de frågar via vår Facebook grupp. Det kommer aldrig tillbaka i tid."

"Mina svar om att dela blir mest hypotetiska. Jag delar när det faller sig naturligt, inget jag letat för att kunna göra."

Facebook

- Delar främst med vänner, då om jag vet om att någon behöver något. Delar med mig av sticklingar via Facebook grupper, men har slutat göra det helt gratis pga. att mötestider osv inte respekteras då. Tyvärr :(Främst via muntligt tal - om man själv eller en bekant exempelvis uttrycker ett behov av en sak som en äger men inte behöver för stunden brukar tillfället dyka upp. Jag är inte med i några specifika grupper för det specifika ändamålet att dela saker. Däremot är jag med i exempelvis Facebookgrupper som "Hur fixar jag det här?", där man delar kunskap snarare än prylar, men också då i syftet att inte konsumera nytt utan istället att ta vara på det man redan har.
- Lånar ibland ut saker till grannar när de frågar via vår Facebook grupp. Det kommer aldrig tillbaka i tid.
- Pratar med vänner, skriver i Facebook grupper
- Via vänner/Facebook!
- Facebook. Blocket. Pratar med vänner eller familj
- Delar med grannar via grupp på Facebook
- Främst via Facebookgrupp, det händer dock väldigt sällan
- Frågar via sociala medier
- Grupper på fb tex.

Direct communication of lending, people asking around

- Delar mest med vänner, vuxna barn. När benen var små både fick vi och gav vidare leksaker, kläder och sportutrustning.
- Lån till/av vänner.
- Delar gärna med dem i min närhet. Dels för att jag litar på att de tar väl hand om grejen när vi gar en relation, dels för att det är enkelt då vi lätt ses. Har sett att det finns appar för att dela prylar men hr inte gått med i något ännu. Kanske lite pga. att jag är introvert att jag har svårt för kontakt med nya människor
- Bil pool, delar skidutrustning med syskon och vänner då vi behöver dem vid olika tillfällen
- Vi lånar av varandra.
- **Erbjuder** när någon frågar
- Lånar ut **vad folk behöver**, ger bort det jag inte behöver, **erbjuder** mina grejer.
- När någon i bekantskapskretsen **säger att de behöver** en XX och jag har det så erbjuder jag dem att låna.
- Kompisar lånar kläder spontant osv, **vet inte riktigt mer vad jag lånar ut...**
- **Lånar till** folk jag litar på
- Träffas och byter
- Jag brukar skänka bort urvuxna kläder och leksaker. Har nyligen tömt mitt föräldrahem, och då skänkte vi bort delar av bohaget. Lånar gärna ut bilen till vänner och anhöriga. Delar på vissa resurser inom bostadsrättsföreningen, t ex redskap och verktyg.
- Frågar kompisar/familj om de har något att låna ut. Lånar ut till kompisar/familj om det kommer på tal att de behöver något.
- **Lånar ut** mestadels
- **Lånar ut** till vänner och grannar.
- Går hem till dem och hämtar, eller tvärtom om de ska låna. Alternativt ses på jobbet och överlämna.
- Ofta går barnsaker, kläder/leksaker till en vän eller väns vän. Möbler har vi **ärvt** från familj/släkt.
- Lånar främst bland vänner (skidor, möbler, kläder, verktyg mm), Möter personen hemma, hos hen eller någon annanstans.
- Erbjuder någon som efterfrågar
- Frågar om jag får låna något
- Delar med vänner och familj. Lämna över?? Fattar inte riktigt frågan
- Jag delar inte med mig till vem som helst utan bara någon jag känner. Jag är emot köphetsen och hjälper gärna bekanta med mina ägodelar. Lycka till
- Oftast vänner eller släkt så blir att man byter när man ses.
- Kollar runt med vänner /kollegor om jag behöver låna något, brukar funka

- Om ngn frågar så delar jag...
- Delar med mig när ngn frågar om ngt.
- Antingen någon men redan känner i dagsläget.
- Ger till vänner/syskon, inte ofta dock
- Delar vissa barnleksaker med barnens kusiner, bor relativt nära och ses några ggr per vecka.
- Med folk jag känner
- Frågar/får frågan
- Någon får husera den, och försöker sedan ha framförhållning i kommunikation gällande behov
- **Om någon frågar**, såklart jag lånar ut om det går
- Det är mest om någon behöver ett verktyg eller om jag rekommenderar någon att läsa en bok, då lånar jag den ofta till densamma.
- Lånar/lånar ut till vänner, grannar o släkt
- Det enda egentligen som jag delar med annan person är en roddbåt som också är köpt i andra hand.
- Säger till så fort jag hör att någon behöver något.
- Lånar av kompisar
- **Lånar ut** till vänner, familj, kollegor när de behöver/ber om det.
- I bekantskapskretsen om någon frågar.
- Hyr ut bil till kollega som bor nära.
- Kommer överens om när prylen behövs och ska vara tillbakalämnad.
- Gör det privat med vänner och familj
- Delar bara med vänner i nuläget
- Delar mest med kompisar
- Ber dom komma över eller tar med mig om vi har bestämt träff
- Delar med kompisar, familj.
- Mina svar om att dela blir mest hypotetiska. Jag delar när det faller sig naturligt, inget jag letat för att kunna göra.
- Vet jag att **någon behöver något**, så **erbjuder** jag det. Precis som om jag skulle behöva något, då frågar jag runt :)
- Så länge jag känner förtroende för personen som jag delar prylar med så är det inga konstigheter. Mer skeptisk om jag ska låna ut något till en person som jag inte är bekant med eller litar på.
- Pratar med kompisar/familj.
- Pratar m vänner el anhöriga
- Delar med någon som bor i närheten och som möjliggör att jag kan ha saken när jag behöver den, och vice versa.
- **Om någon frågar lånar man ut :**
- **Lånar ut** om nån i min närhet uttrycker att dom behöver låna nåt
- Inget märkvärdigt. Kommunikation löser det mesta!

- Jag delar bara med personer jag litar på, då jag är rädd att förlora saker/att saker ska gå sönder. Oftast handlar det om att en person hör av sig och frågar om hen får låna x, och i sådana fall möts vi upp/hen kommer förbi och hämtar. Jag skulle inte känna mig bekväm att låna ut saker till främlingar även om det fanns en ekonomisk trygghet i att de t ex blir ersättningsskyldiga, eftersom jag bryr mig mycket om mina saker
- Frågar eller blir frågad

Hygglo/app

- Appen Hygglo, lånar/lånar ut till vänner och familj/
- Har börjat lägga upp saker på Hygglo.

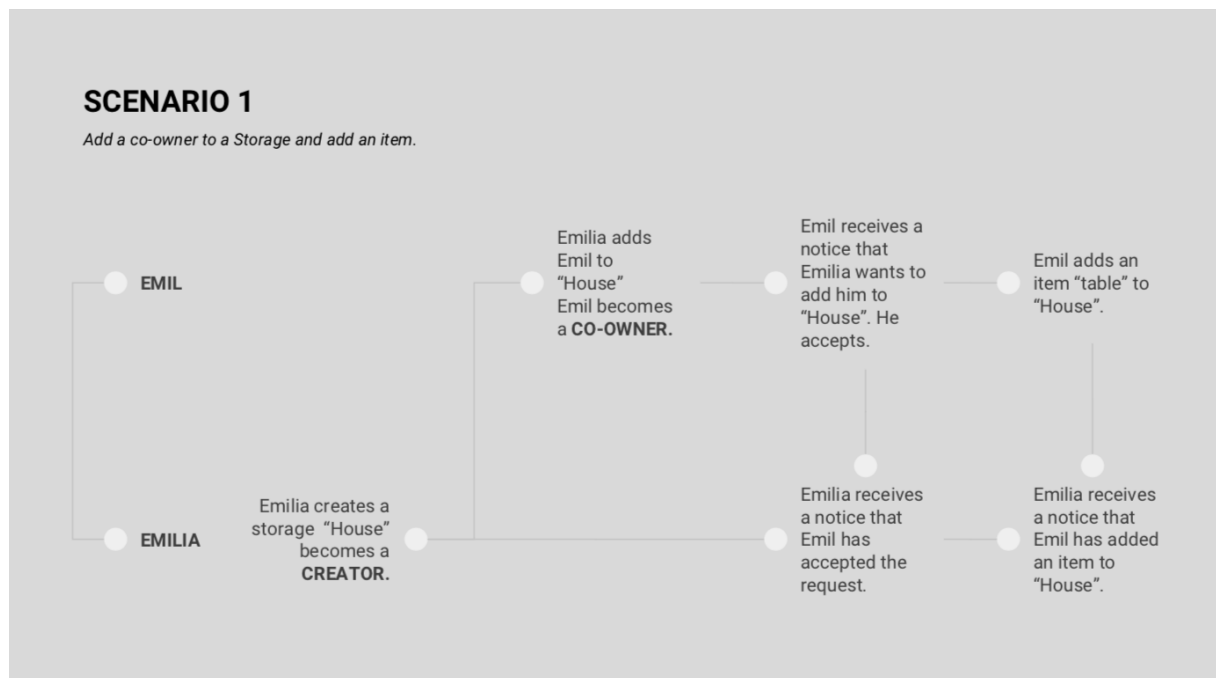
Others

Delar på odlingslott, köper klättringsutrustning ihop med vänner. (Skulle inte hyra ut min lgh genom Airbnb men definitivt låna ut min soffa m, typ coachsurfing).

Abonnemang på kläder som byts varje månad via post, bil pool, om vän/familj/släkt/kollega ses och byter/får tillbaka. Att däremot låna saker av t ex ett företag som har ett "bibliotek" med grejer hade varit toppen, och jag hade kunnat tänka mig att donera saker jag inte behöver/använder dit

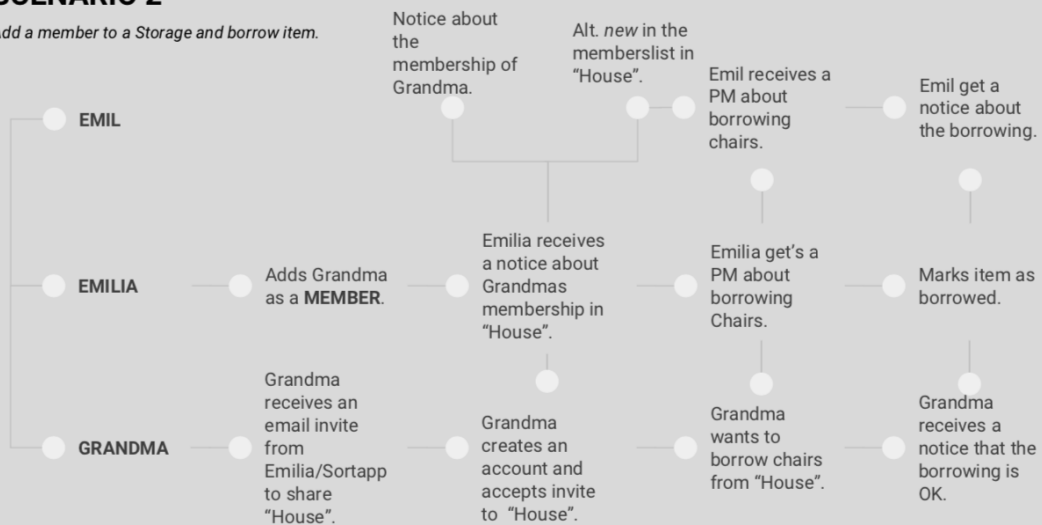
Appendix IX

Different Sortapp users/members and examples of various scenarios in phase 2



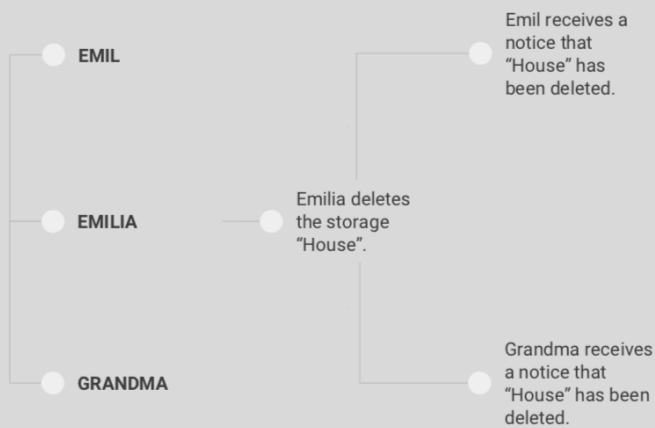
SCENARIO 2

Add a member to a Storage and borrow item.



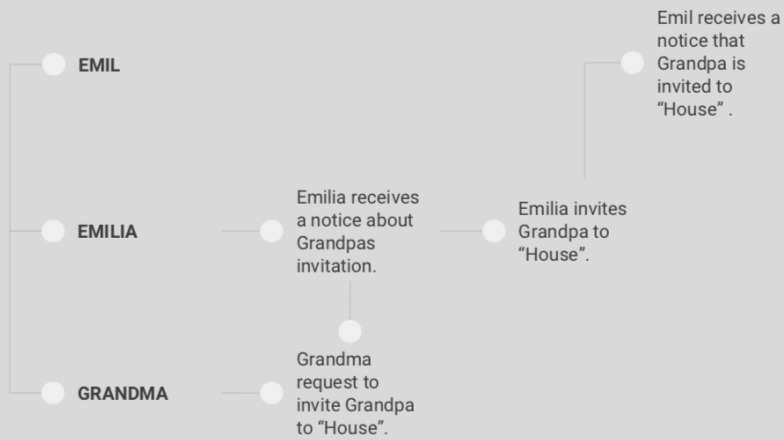
SCENARIO 3

Creator deletes Storage.



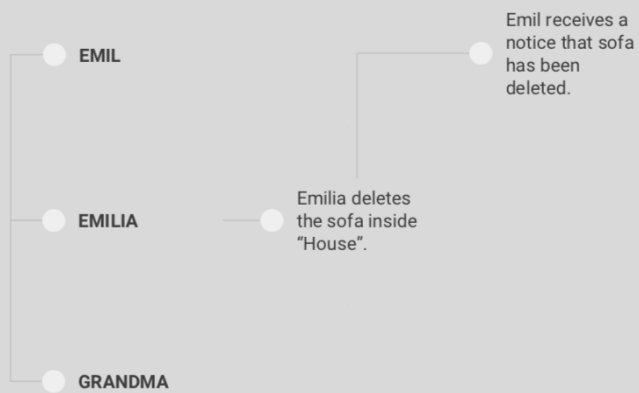
SCENARIO 4

Member request an invitation for a new member.



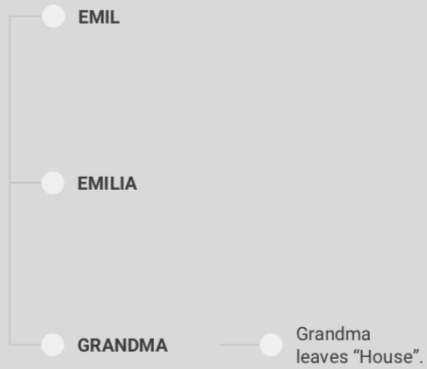
SCENARIO 5

Creator deletes item.



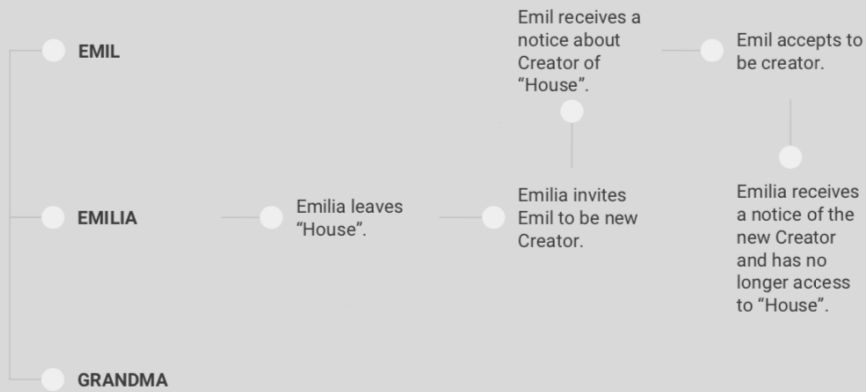
SCENARIO 6

Member leaves a storage.



SCENARIO 7

Creator leaves a storage.



SCENARIO 8

Member deleted from a storage.



Journey maps in phase 2

JOURNEY MAP

How do people share items today?

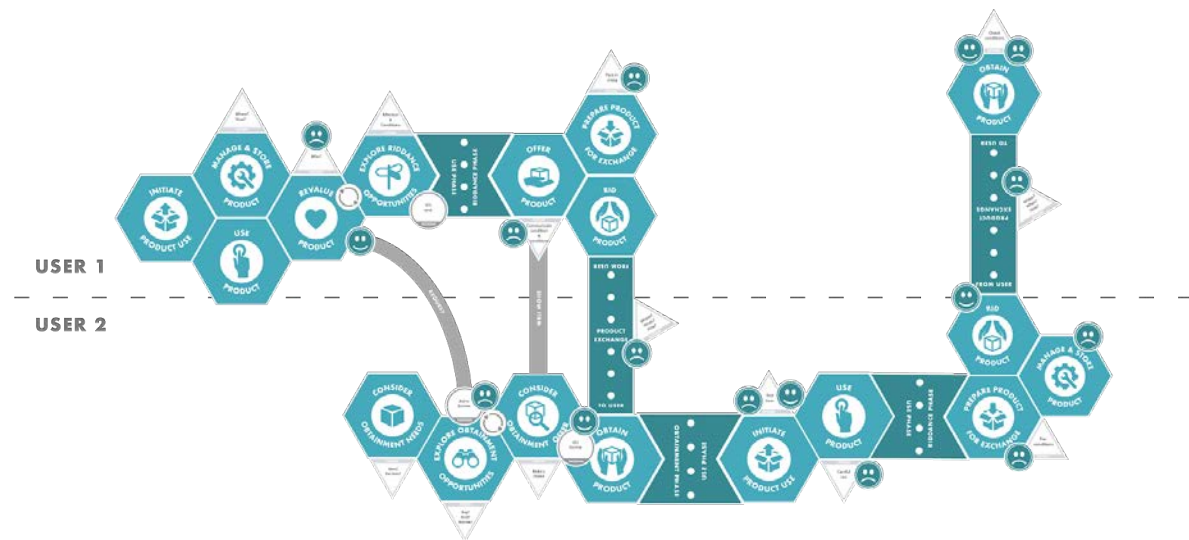


Illustration of the first journey map of what a sharing process could look like today.



Illustration of communication exchanges.



Illustration of icons representing positive and negative feelings



Illustration of the different activities used when describing a product journey.

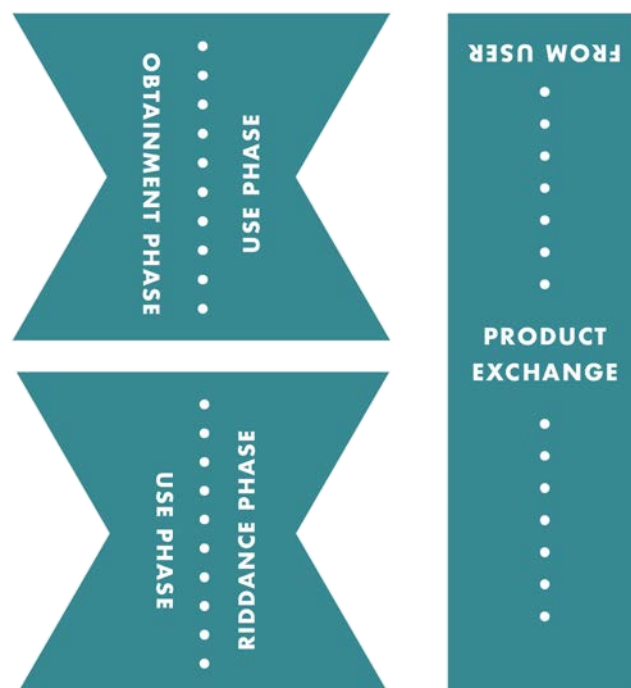


Illustration of the different phases and exchanges in the journey map.

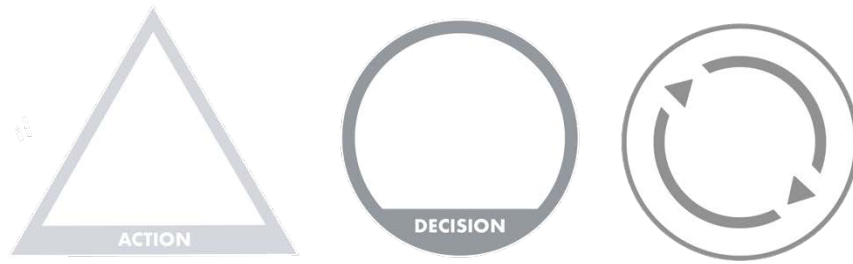


Illustration of action, decision and iteration factors.

JOURNEY MAP

How people might share items with Sortapp?

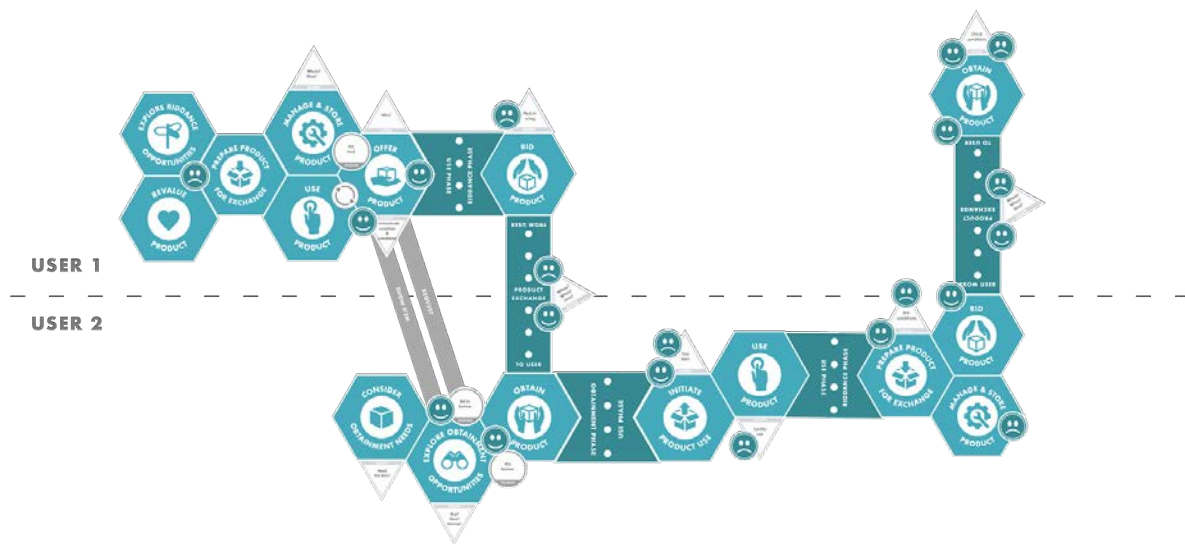


Illustration of the second journey map, describing what a sharing process could look like with Sortapp.

Appendix XI

Script for testing the Adobe XD prototype

Having in mind...

The prototype is designed for iPhone 10, if you do not have an iPhone 10 you will need to scroll up and down to see the entire interface :-)

1. SEARCH FOR ITEM TO BORROW

Din uppgift är att söka efter en pall inom 1 km. Välj pallen som Sortapp hittar närmast dig och låna den mellan datumen 10–12 juli.

2. ADD ITEMS

Gå in på (+) ikonerna. Du har nu tagit bilder på olika prylar som du vill lägga in i Sortapp som **flera** olika items. Dela upp din item så att de blir item**S**. Nu vill du dela flera av dessa items, välj; stolen, kameran och datorn att dela. Välj din location och definierade condition. Dela med "Neighbours" och Fredric Aviana.

3. ADD ITEM & SHARE

Gå in i "Sommarstugan" och addera ett item, ta ett foto på stolen och spara bilderna som **ett** item, men kolla på första bilden hur den ser ut. Gå därefter vidare och dela ditt item genom att antingen söka på Chalmers tvärgata 1 och sen välja alternativet other i conditions ELLER välja din nuvarande position och den definierade alt. i conditions. Därefter dela med "Grannarna" och Felicia.

4. SEARCH FOR PEOPLE & THEIR SHARED ITEMS/BOXES/STORAGES

Sök efter Felicias delade saker med dig, antingen genom att söka efter henne i din kontaktlista eller välja Felicia i din kontaktlista och visa sedan resultaten.

5. NEWS

Kolla i ditt news-flöde för att se din senaste nyhet och gå in i inställningar.

KLICKA

Kolla andra alternativet av news-flöde, vilket alternativ gillar du bäst? Varför?

Appendix XII

Analysis Adobe XD tests in phase 3

Comments documented after tests

Similar to Pinterest, goes according to their features. Don't understand Facebook similarities with notices.

News can be the wrong word to use, use notes/notification, etc. like. News can be tips or so in Pinterest.

Can be difficult to understand that news presented inside Profile.

Always click on everything and check what I can do when I download apps.

Would love to slide from main to news.

When you search for a name you still want to go to search.

Always know that gears are settings.

Hard to see the red note symbol.

Nudges sharing good for getting people to share.

Good with symbols you recognize.

Utilize whole buttons for interaction, not just symbols. ex. calendar, and contacts.

Hard to remember to have to scroll to see the whole screen. Very difficult to understand/analyze the user experience.

The calendar feature was liked by many, intuitive and easy to fill in.

Conditions, date, contact owner on search item - change the order? contact owner after sending inquiry?

Multiselect instead of select?! Alt. hold in to edit or select?!

Contacts under search or that the symbol is not called shared (no names ?!), well inside shared no probs.

Most like news in main but they also do not see the red notification, except the one that had big screen, it showed directly.

Comments from the videos

Subject JR

press distance before chosen an item name.

conditions are not explained enough

pressed select first, but no reaction so tries to press images

confusing how to select several items

difficult to press the active features

finding share icon is easy

presses the (+) to add friends

tries to enter search feature

understands that the top and highlighted is the newest.
wants to switch by swiping left and right (Main / News)

Subject HK

difficult to understand conditions, wants to select dates first

does not understand what she is trying to accomplish...

selects multi, but back to single.

finds the edit single feature and shares there

understands the checking of location etc.

adds friends by pressing the whole name bar

does not know how to select several

when found easy to understand the check boxes

understands the (+) icon is add item

understands share icon

condition "other" can be selected without typing, the keyboard should pop up when checking the box

wants to go to search feature

selects shared after trying to select search

contacts easy to understand

does not find the notification center in profile

tries the add feature, the search ...

tries search

sees main / News after scrolling up

Subject MK

wants to select distance first

difficulties with screen size

wants to select dates first

easy interaction with calendar

wants to have the date bar active not only the calendar icon

finds multiple

tries to press one item

finds select and understands the check box

easy to share

presses + to add friends

“likes to check what has been selected before adding an item”

the different images shown is a little confusing on what has been added, should be one item

finds share

wants to press (+) when adding friends

tries to select profile

finds shared because of the blue blinking

sees contacts

when describing notification center as news confused to what to look for.

News was understood as news on the app, much like Pinterest...

tries to enter search

scrolls up and sees Main / News

Subject EJ

finds search, difficult to press

presses date bar before conditions, did not see the check box

wants to select the whole bar not only the calendar icon

good to get feedback on what has been completed

interacts with the outer part, the internet features, not XD

understands single / multiple

next steps are easy

finds share and sees contacts

did not understand what the result was

news as news in Pinterest, main page. wrong name for notifications

expects settings under profile

sees news directly

likes both alternatives,

Subject RS

finds search easy, but difficult finding where to write pall

miss the conditions, choose date first

want to contact owner

forgets to scroll

presses pics first
miss multiple firstly
presses the pics not select, edits the camera, finds share 1 item
finds select because it lights blue
understands share easily

finds the plus sign easy and understand it is added
presses add item instead of share but agrees to share after popup and then
understands
other- write square should expand when checking the box.

wants to press the search to find people then finds the share when blue
understands the rest

finds the notifications after scrolling two times, but goes in due to red sign
finds settings easy
easy to find news on another example
good to have messages to YOU in profile (comment) preferences on main page

Subject ES

Has big size phone
finds the search bar directly
checks conditions quite fast

does not see multiple
presses the small ones instead
found select fast
checks the boxes
finds share

fonds shares easy in single to
wants to choose many conditions

search first to find people
find share due to the blue light
finds contacts quick
rest easy

finds the red dot quite fast as well as settings
easy to find news
good she had big phone!