Familiearkivet

- A system that supports the caretaker -

Master Thesis

IDA Group 09

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Resumé

For mennesker kan genstande have meget stor betydning ud over deres materielle værdi, fordi der er minder indlejret i dem. Det kan være minder om en afdød, begivenheder der formede resten af ens liv, situationer fra hverdagen og meget andet. Genstande med denne type af indlejrede minder kan have så stor betydning for en gruppe af mennesker, at de har en speciel magt over dem. I dette projekt betegner vi disse genstande som "umistelige genstande" og vi undersøger dem i en familiekontekst.

Personer der har umistelige genstande i deres besiddelse kan bedre beskrives som "plejere" af genstandene end som ejere. Dette skyldes at de ikke føler sig frie til at gøre med genstanden som de ønsker, da de ved at der er andre end dem selv, for hvem det betyder meget at genstanden bliver i familien, disse andre personer kan både være levende og afdøde. En plejers vigtigste opgave er at de umistelige genstande bliver i familien, fordi de for dem repræsenterer en vigtig del af familiehistorien eller nogle vigtige minder. For at sikre genstandenes viderelevering i familien fortæller plejeren om genstandenes historie, viser dem frem eller bruger dem, for at de næste generationer kan få et forhold til genstandene. Der er dog genstande som ikke egner sig til at vise frem eller bruge, hvilket også kan medvirke at historierne ikke bliver fortalt. Der kan være mange grunde til at genstandene ikke har en fremtrædende position i hjemmet, eksempler kan være at de er for skrøbelige, at genstanden ikke passer ind i et moderne hjem eller at plejeren er bange for indbrud.

I dette speciale undersøger vi disse umistelige genstande i danske familier. Vi søger derudover at skabe et system der hjælper plejeren med at tage sig af disse genstande så de kan gå i arv fra generation til generation. Vi har valgt at kalde systemet for Familiearkivet. Familiearkivet består af to elementer: En app til smartphones hvor plejere kan registrere genstande med billeder, en lydfortælling og små korte fakta om hver genstand, som modtagere kan udforske. I appen kan man også vælge hvilken genstand det andet element, den digitale billedramme skal vise. Billedrammen står i alle husstandene i en familie der bruger familiearkivet. På billedrammerne vil der være det samme billede og det vil være op til brugerne at vælge i appen hvilken genstand billedrammen skal vise.

Med Familiearkivet søger vi dermed at understøtte historiefortælling og fremvisning af umistelige genstande for at hjælpe plejeren med at tage sig af disse ting. Med udgangspunkt

i evalueringen af systemet argumenterer vi for at vi har formået at skabe et system der støtter plejeren med at tage sig af umistelige ting. Vores resultater peger i retning af at registereringen af genstande i Familiearkivet har gjort modtagere mere opmærksomme på nogle genstande og de har ydermere fået mere viden om dem. Det tyder på at Familiearkivet formår at støtte plejeren i at overbevise modtagere om vigtigheden af de registrerede genstande. Det må dog tilføjes at den korte periode for systemets brug som har været muligt i dette projekt, skaber en begrænsning i forhold til at vurdere i hvor stor udstrækning Familiearkivet støtter plejere af umistelige genstande. Dette skyldes at systemet er tiltænkt som et system der bliver mere betydningsfuldt med tiden da det netop er designet til at historier og minder om genstande bliver bevaret også efter at personen der nu kender historierne er gået bort.

Contents

Preface

Dette speciale er lavet i perioden fra februar 2022 til juni 2022 på uddannelsen IT Design og Applikations Udvikling.

Vi har igennem dette projekt søgt en dybere forståelse af umistelige genstande i familier og deres plejere samt at udvikle et system der støtter plejerne i at passe på genstandene. Tak til Birte og Sara for at gøre os opmærksomme på dette spændende emne.

Vi vil gerne benytte forordet til at takke de personer vi har fået lov til at interviewe samt familierne der testede vores system. Vi har lært meget af jeres deltagelse og feedback, tak.

Desuden vil vi gerne takke vores vejleder Dimitrios Raptis, der har støttet og udfordret os under udformningen af dette speciale.

Tak til Magnus og Mikkel for at kigge med faglige øjne på vores system, og tak til Valdemar for at læse korrektur.

Til sidst vil vi takke vores familier for deres opbakning og støtte.

Chapter 1

Introduction

Many of us know the feeling of having an object which we take extra good care of. We may watch our steps carefully when we move it, place it further away from edges, instruct children not to touch it and so on, depending on the type of object. Some of these objects may be gifts from family members or family heirlooms which represents a part of the family history or bring back memories of people, situations or events. This may be the case because memories can be embedded in objects which enhances the sentimental value of it (Csikszentmihalyi and Rochberg-Halton 1981, p. 21).

In families there may be objects with great sentimental value for several members in the family. In these cases the family member who has the object in its care may not feel like the real owner of the object, because they know that other family members, both living and deceased, would be sad if the object got lost or damaged. Therefore, they do not feel free to do with the object as they please. In these situations we argue that the person holding the object is better described by using the term "caretaker". Carolyn Folkman Curasi, Linda Price and Eric Arnould define a caretaker as a person who possess objects with a sacred irreplaceable value created by the association it has with a time, place or person which creates an imaginary power over a group, also called "inalienable objects" (Curasi, Price, and Arnould 2004, p.610).

In this project the terms "caretaker" and "inalienable objects" are central, as we seek to develop a system that makes objects inalienable in families by supporting the caretaker. In order for us to examine this area of concern we first need to define the two core terms "object" and "family". We choose to define an "object" as a thing that can be seen and touched, but is not alive. By this definition we only exclude living things. We argue that living animals and humans can not be inalienable because they do not last, and we therefore find the definition fitting for this project. The term "family" may be more complex to define as a family can have many constellations. We do not wish to exclude any family forms and we therefore, choose to use a broad definition of the "family" term inspired by Anna Woodham et al. "Family" in this project refers to a group of people with a shared bond or identity. It can be friends, housemates or blood relatives living together or apart from each other. With this definition we are open to any constellation that people may define as their family (Woodham et al. 2017, p. 206).

Based on the above with this project we seek to answer the following problem statement:

1.1 Problem statement

How can we develop a system that supports caretakers in taking care of inalienable objects?

1.1.1 Work process

To structure the report and work of this project we use the design process as proposed by David Benyon (Benyon 2013). Designing a new system can be challenging as it involves identifying users' needs while addressing them in an interactive system. Benyon proposes four phases to structure the design process: 1) understanding, 2) envisionment, 3) design, and 4) evaluation which can be seen in figure 1.1.

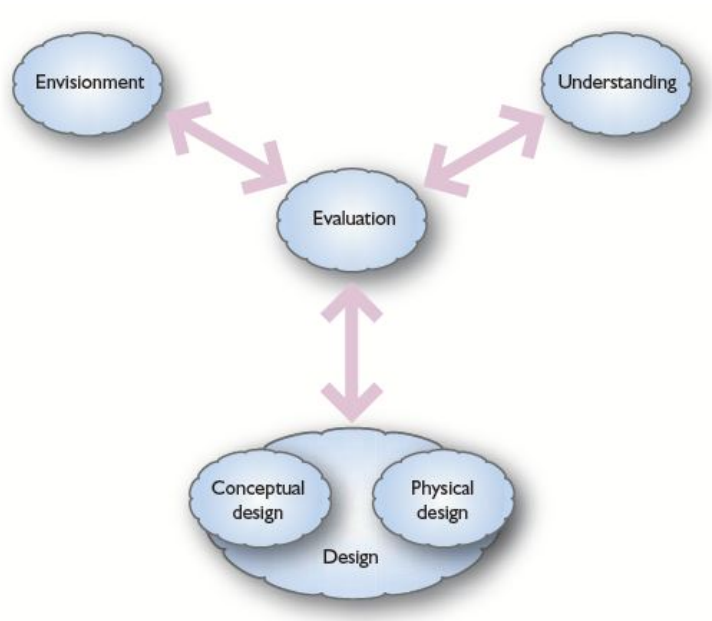

Figure 1.1: Design process by David Benyon (Benyon 2013, p.49)

The understanding phase aims at exploring what the system should do and what user needs it should accommodate (Benyon 2013, p.50). The envisionment phase serves to clarify ideas through visualisation techniques (Benyon 2013, p.53). The design phase consist of both the conceptual and physical design. The conceptual design is the abstract design where the designer considers what information and functionality are needed within the system. The physical design is about taking the abstract design and making it concrete, detailing the look and feel of the system(Benyon 2013, p.53). The last phase is evaluation, as seen in figure 1.1 this phase is a very central phase, as it should be done during all the other phases to ensure

that they support the right development (Benyon 2013, p.53). As seen in figure 1.1 all the activities are conducted in close relations to each other, thereby creating an iterative process. This means that information gathered from one activity can affect or reevaluate an earlier conducted activity (Benyon 2013, p.49).

The figure also demonstrates that the design process can be started at any point, meaning that the process can happen in any order (Benyon 2013, p.49). Therefore designers need to consider how the design process is best suited to support the given task.

1.1.2 Reading guide

We have decided to structure our work process in accordance to Benyon's design process and is presented in the following order:

In chapter two we present our understanding process. It is composed of an overview of related work concerning the research area of this project, which serves to provide the theoretical frame to which this study belongs and provides an overview of our problem area. Chapter two also contains a description of our analysis of the problem area as we seek to get a deeper understanding of people and their needs within the problem area.

In the following chapter three we describe our envisionment phase, as we present possible design solutions for the identified problem area, and it will conclude with a final design.

Chapter four contains a description of our design phase where we present our design solutions, this is where we present a definition of our system and identify the users and functionality within the system. The section concludes with an overview of the graphical user interface and navigation.

In chapter five we present how we developed the system and implemented the functionality.

Chapter six presents our evaluation of the system, here we will present one test and a field deployment that was used to collect data in order to evaluate how the system was used.

The next chapter seven consist of a discussion that is based upon our findings from chapter six.

The last chapter seven present our conclusion where we will present how we may answer our problem statement.

Chapter 2

Understanding

In our study we aim to understand how we may develop a system that supports the caretaker in taking care of inalienable objects. To achieve this goal we are going to conduct the understanding process as proposed by Benyon (Benyon 2013, p.138). The understanding process aims to explore and gain knowledge of humans, activities and the context in the problem area which we need to understand in order to develop a system that accommodates the needs found(Benyon 2013, p.50).

2.1 Related work

We have decided to start the understanding process by gaining knowledge of our problem domain by examining prior research that focus on how people relate to objects and how family objects are experienced.

2.1.1 People and their objects

People's relations to objects have been a subject in many studies, among these we find Mihaly Csikszentmihalyi and Eugene Rochberg-Halton with their study of objects outside of their material meaning and value (Csikszentmihalyi and Rochberg-Halton 1981, p.190). Through their research they found that people build an identity through interactions with their possessions (Csikszentmihalyi and Rochberg-Halton 1981, p.190), and add feelings and emotions which gives a symbolic meaning to the objects. Even the most utilitarian objects are difficult to disentangle from the symbolic meaning, because they socialise a person to a way of life (Csikszentmihalyi and Rochberg-Halton 1981, p.21). Csikszentmihalyi and Rochberg-Halton found that there are many types of relationships as people experience objects differently depending on age and gender (Csikszentmihalyi and Rochberg-Halton 1981, p.119). They state that people, consciously or unconsciously, interpret objects that means something to them, in the context of past experiences (Csikszentmihalyi and Rochberg-Halton 1981, p.21). Likewise, John Gillis has stated that an essential part of personal identity is family objects displayed in the home. He further argued that people have a desire to represent themselves, which has turned homes into mini-museums for displaying and preserving family heirlooms, mementos, and souvenirs (Gillis 1997, p.xvi).

This gives reason to examine how family objects are experienced, viewed upon and preserved. In this line of study we find Liz Gloyn, Vicky Crewe, Laura King and Anna Woodham

who studied the concept of the family archive, which they defined as *'archival and curatorial practices that takes place outside formal cultural and heritage organizations'*(Gloyn et al. 2018, p.158). It consist of both physical objects, photos and documents which all play a role within the memory and history of the family (Gloyn et al. 2018, p. 157). They stated that the family archives are a conscious act to curate an organized collection of items valuable to the family (Gloyn et al. 2018, p.158).

Agreeing with Csikszentmihalyi and Rochberg-Halton (Csikszentmihalyi and Rochberg-Halton 1981), they also found that interactions with objects makes people develop a relation to them (Gloyn et al. 2018, p.163). Furthermore, they argued that a family archive is not static as it changes in accordance to the relations between family members (Gloyn et al. 2018, p.171).

The practices identified in the family archive has also been the subject within the world of Human Computer Interaction(HCI) as scholars such as David Kirk et al. have studied the possibilities of integrating these practises within interactive systems (Kirk et al. 2010). For this purpose they developed an interactive tabletop which allows users to display pictures of objects and photos onto the tabletop. The users could move these objects around and make virtual boxes to 'store' these objects in (Kirk et al. 2010, p.263). The tabletop was developed to contradict the old and complex traditions of archiving by not only being the center of every home but also offering a playful and simple interaction (Kirk et al. 2010, p.262). The conclusion to their study was that the device supported a wide range of activities, from playful interaction to managing more serious archival practises. Kirk et al. found that different members of the family had different reasons and intentions for using the device, as it was used both collaboratively with the whole family but also individually (Kirk et al. 2010, p.268). In addition to the different of use Kirk et. al concludes that if an archiving device is to be used to manage content, it must conform to important functionality that supports the archival practises such as registering and preserving objects, thereby deviating the system from the chaos of play (Kirk et al. 2010, p. 269).

The studies of Gloyn et al. and Kirk et al. offer perspectives to understand how even unremarkable objects may be valuable due to the role they play in a family event, anecdotes or as a connection to an individual in the family (Gloyn et al. 2018, p. 160).

This concept is also described by the term "Inalienable wealth", which Annette B. Weiner describe as objects *"imbued with affective qualities that are expressions of the value an object has when it is kept by its owners and inherited within the same family or descent group"* (Weiner 1985, p.210). She stated that age and the ability to keep the object for generations add value to an object, but the main value is the power an object has, as it brings the past into the present, and to lose this kind of object would mean to lose a part of oneself (Weiner 1985, p.224).

To further elaborate the concept of inalienable objects and examine it in the context of the family, we use the research by Carolyn F. Curasi, Linda Price and Eric Arnould (Curasi, Price, and Arnould 2004) (Price, Arnould, and Folkman Curasi 2000). They have examined cherished objects meaning to people and how individuals cherished objects become part of a family's inalienable wealth (Curasi, Price, and Arnould 2004). In a study about older adults practices and concerns regarding disposition of special possessions, they found that the worth of cherished possessions increase over time and identified a dilemma people can have; a desire to hold on to cherished objects but also wanting to transfer those to others in order to pass on history and traditions (Price, Arnould, and Folkman Curasi 2000, p.189). This is also supported by a desire to keep things in the family for generations (Price, Arnould, and Folkman Curasi 2000, p.190). They found that people use different tactics to decide who should receive what and when (Price, Arnould, and Folkman Curasi 2000, p.190). In later research they have identified the role of caretakers to affect inalienability (Curasi, Price, and Arnould 2004, p.609).

They distinguish between ownership and possession, as a caretaker may possess an inalienable object, but not own it. The reason for this is that it is the family that have the rights to sell it, not the caretaker unless there is an extra ordinary reason to sell it (Curasi, Price, and Arnould 2004, 610). They found that the caretaker is responsible for passing objects onward along with the stories and the rituals regarding the use and preservation of it. The researchers describe the rituals as reflecting the objects' inalienable status and they are often passed on to the next caretaker along with the stories (Curasi, Price, and Arnould 2004, p.617). By doing so, the inalienability can be maintained (Curasi, Price, and Arnould 2004, p.618). Inalienable objects possess a sacred irreplaceable value created by the association it has with a time, place or person which creates an imaginary power over a group (Curasi, Price, and Arnould 2004, p.610).

Therefore, according to Curasi, Price, and Arnould, caretakers fear to lose inalienable objects, as it would also impact the group rather than just themselves. However it is also a burden and an obligation to be the caretaker of inalienable objects because of the responsibilities that follows (Curasi, Price, and Arnould 2004, p.618).

2.1.2 Storytelling

As stated in the research of Curasi, Price, and Arnould, storytelling is used as a mean to both establish and maintain inalienability, by attaching oral stories to objects (Curasi, Price, and Arnould 2004, p.616). Therefore, it is relevant to examine how storytelling is practiced in families. The scholars Jasmine Jones and Mark S. Ackerman have studied storytelling practices in order to find out how to design systems that implements storytelling in a family context, where stories are passed on from generation to generation (Jones and M. Ackerman 2018, p.10)(Jones and M. S. Ackerman 2021). They understand family stories as a co-construction

by members of the family in the roles of tellers, who are the persons with a story to tell, and listeners, who are the persons who wish to listen and learn about the family (Jones and M. Ackerman 2018, p.10). Like other research (Curasi, Price, and Arnould 2004), they also found that some felt an obligation to share the stories and knowledge (Jones and M. Ackerman 2018, p.7). When designing systems to support the practice of storytelling, they argued that the technological platform should facilitate the right timing for storytelling. They found that storytellers sometimes wait for an ideal moment to tell a story, while listeners wait, out of respect, for a storyteller to share their stories. This dilemma produces a waiting period that can extend into a lifetime. This is why Jones and Ackerman argue that the technological platform should consider both the wishes of the story teller and those of the listener (Jones and M. S. Ackerman 2021, p.17).

2.1.3 Preserving memories and stories

Several studies have examined ways to design systems incorporating and preserving memories and stories. In this focus area we find the studies that examine the concept of tangible memories, where memories are stored in physical objects as a form of tangible memory collection and makes memory retrieval easier. This is the focus of the studies 'if these walls could speak' and 'Slots-Memento'(Mosher 2017)(Li et al. 2019). In the former, a storage system was developed as a shelf with river rocks which was used as memory tokens where users could record audio stories into. These memory tokens could then be played by placing it in a certain spot on the shelf (Mosher 2017, 2). While rocks worked well for this study, they suggest that future studies could use other objects, e.g. souvenirs for memory storage. They also propose possibilities to attach several memories to one object and to save those online to allow the same memory to be played on multiple shelves, thereby sharing memories with others (Mosher 2017, 4). The latter is designed to look like a slot machine. The user can then pull a handle to switch memento photos. The machine also enabled users to record stories to these memento photos.In general Slots-Memento was accepted as a way to reminisce and talk about memories, but they found that the users wanted to be able to share the recordings by a story playing function (Li et al. 2019, s.364).

'If these walls would speak' and 'Slots-memento' both made it possible for the user to store and preserve memory in tangible objects, and enabled users to revisit or share the memories. Another view on tangible memory is the studies of the memory box and the living memory box (Stevens, Vollmer, and Abowd 2002) (Frohlich and Murphy 2000) which handle the concept of tangible memory by developing a device that allows users to record and play stories associated to objects placed in the device (Frohlich and Murphy 2000, p.238). The benefits that 'the memory box' concludes is that storing memories does not only allow users to revisit them,

but also to share stories for others to hear (Frohlich and Murphy 2000, p.240). They concluded that the value in recording and saving stories were to give it to others as a gift or an heirloom, rather than for themselves to hear. They also found that there were a need to find a way to accommodate bigger items like bicycles and pianos (Frohlich and Murphy 2000, 2).

2.1.4 Summary

In this section we presented previous research related to our area of research. We have addressed that family objects are essential for peoples identity and how they use those objects to represent themselves by displaying them in their homes. Furthermore, people interpret objects in the context of previous experiences, and they develop relations to objects by interacting with them. Archiving artifacts in families, is a conscious act to preserve those objects important to a family, rather than an individual, and it is dependent on the relations between family members. To describe a specific type of objects which have meaning and power to several persons in a family, we draw on the concept of inalienable wealth. Inalienable objects are kept in the family, passed on from generation to generation along with the associated stories and rituals, and it is a caretaker's responsibility to ensure that. As storytelling is used to establish and maintain inalienability, we have presented research on storytelling practices in families as a co-construction between family members practiced by tellers and listeners. Lastly, we presented several studies which examined ways to incorporate memory- and story preservation within interactive systems.

2.2 Problem area

After having gained knowledge of our related research, we continue the understanding phase as we now need to further understand users needs (Benyon 2013, p.130). In this chapter we present how we gained knowledge of our problem area through a data gathering process. This will conclude in a presentation of our findings that will reflect what needs and context we have identified in our problem area.

As presented in section 2.1 in this project we examine people's relations to their objects in the context of inalienability. To be able to develop a system that supports caretakers in taking care of inalienable objects we need to explore how people experience inalienable objects and what challenges and needs they may have in relation to this. In order to obtain an understanding of this, we formulated research questions as our analytical framework.

Our research questions are based on our need to first of all investigate a possible presence of inalienable objects and afterwards identify participants experience with this types of objects. With this in mind we defined the following research questions:

- Which objects can become inalienable?

- How are inalienable objects experienced?

In order to answer these questions, we decided to use a qualitative approach to get different participants subjective experience with inalienable objects.

2.3 Interview

For the interviews we decided to target people who had reached the retirement age because we estimated they may have gathered and inherited inalienable objects while they also may have started to consider which objects they want their descendants to inherit. We found eight people to interview, three men and five women, in the ages between 54 and 84 years, see table 2.1.

Gender	Name	Age	Children
Female	Grethe	54	3
Female	Ditte	69	3
Female	Ingrid	72	5
Male	Henrik	73	5
Female	Jytte	73	2
Male	Kurt	80	3
Male	James	84	2
Female	Britta	84	2

Table 2.1: Demographics of first interview

To get answers on what objects are inalienable, we assumed it would be best if the participants had time to think about their answers. We therefore asked the participants to prepare for the interview by selecting five to ten objects that are important to them and take pictures of these objects with their smartphone, if possible, so they could bring them to the interview. We chose the word "important" instead of "inalienable" because we wanted to use a broad and understandable word that the participants could interpret themselves.

We prepared an interview guide(see Appendix A) based on our research questions to conduct semi-structured interviews. After the first interview we learned that it would be more fitting for the interviews to be less structured, as some of the answers and stories we got were very personal and often touched sentimental and sensitive topics about the participant. This made it difficult and sometimes insensitive to hold on to the predefined questions. Furthermore, some questions were only relevant for some objects, while at other times there was a

need for getting more in depth and ask other questions that emerged from the conversation. We kept the interview guide to check up on the received information during the rest of the interviews, but we conducted them as more unstructured interviews than first planned.

The interviews took between 30 minutes to an hour, and we decided to interview people individually because we reckoned that the stories could be very personal. The participants were informed that the interviews would be made anonymous. The names in the analysis are therefore fictional.

During the analysis we found gaps in our data and decided to conduct some additional interviews where we focused on the role of the caretaker and how they experience inalienable objects(see Appendix B). We planned interviews with one of the former participants, who we believed were a motivated caretaker, and her two daughters, in order to get a better understanding from different perspectives.

Gender	Alias	Age
Female	Britta	84
Female	Oldest daughter	61
Female	Youngest daughter	60

Table 2.2: Demographics of second interview

We gave the mother the task to gather the objects she had selected for the first interview. Furthermore, we asked her to choose about five other important objects, which could not be heirlooms, and tell us about them. We did this to find out more about the different experiences of the objects. Afterwards, the daughters were asked individually to tell us all they knew about those objects, without the mother being in the room. This could provide more data from another perspective and data on if/how the mother succeeded as a caretaker. Lastly, we asked the mother to point out objects in a specific room, which she wished her descendants would keep. Afterwards we asked the two daughters, one by one, to point out, in the same room, which objects they would be interested in inheriting. In this way we could find out if there were differences between what a caretaker might want to pass on and what the descendants actually want to inherit. We were also interested in finding out how they experienced this kind of task.

2.4 Analysis

To analyse our interviews we decided to conduct a thematic analysis which is *"a method for identifying, analysing and reporting patterns within data."* (Braun and Clarke 2006, p.6). Our thematic analysis was deductive, top-down driven we where supported by Curasi et. al (see section 2.1) to identify themes. Though some may argue that it provided us with poorer interpretation of our overall data set (Braun and Clarke 2006, p.12), we believe it gave us a more detailed analysis on the important aspect of our data.

The result of the thematic analysis is an overview of the collected themes found in our data which can be seen in the summary in this chapter. We define a theme as a repeated phrase that *"Captures something important about the data in relation to the research question and represent some level of patterned response or meaning within gathered data set"*(Braun and Clarke 2006, p.10). With these themes we identified useful paragraphs and searched for repeating commonalities which we organized into larger themes. The wording of the theme was decided based on how communicable it was. Meaning it should make sense and be understandable by other researchers having access to the same data (Auerbach 2003, p.84).

2.5 Findings

In this section we first describe which types of objects our participants brought with them to the interviews, to show the kinds of objects that potentially could be inalienable. Afterwards we describe how objects can become inalienable and how caretakers can live up to their responsibilities in order to insure that objects become or stay inalienable.

Our participants brought 55 objects in total with them to the interviews. In general the selected objects were literally everything between a tractor from 1959, to a book with photographs of a deceased son who died only three months old, and a preserved salmon which won the price as the largest fish in a contest. Table 2.3 is a list of the objects divided into categories.

Object categories	Amount
Adornments	12
Jewellery	9
Books	4
Photographs	4
Textiles	4
Furniture	3
Plants	3
Other	16

Table 2.3: Objects participants brought with them

Figure 2.1: An example of an inalienable object. Jytte inherited the painting from her parents. When she was a little girl, she used to play on the beach imaged in the painting, and it therefore reminds her of her childhood

2.5.1 Which objects can become inalienable?

Similarly to earlier research (Curasi, Price, and Arnould 2004) we found that a large part of the inalienable objects selected by the participants were heirlooms inherited from relatives with family history and/or memories embedded in them.

We draw on the studies of Weiner and Curasi, Price and Arnould to define family history as including domestic history, achievements of ancestors and special events (e.g. national history colliding with family achievements) (Weiner 1985, 210) (Curasi, Price, and Arnould 2004, 610).

We distinguish between family history and reminiscence, as we found reminiscence to be established by using or displaying objects, rather than representing certain historical aspects within the family. This aligns with earlier research that argue objects become meaningful by people interacting with them (Csikszentmihalyi and Rochberg-Halton 1981). Thus, this type of objects are embedded with general memories of the family such as ones childhood, ordinary daily habits, moments with the family and much more. Some of the objects may clearly represent either family history or reminiscence, but several of them represents both.

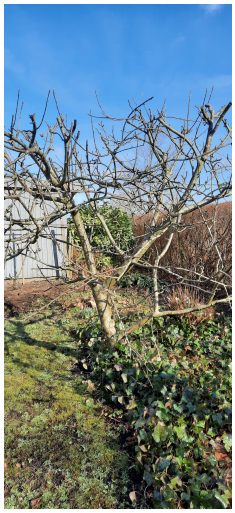

Figure 2.2: The apple tree in the picture comes from a tree which was planted from apple seeds brought back from the First World War.

Family history

An example of an object which represents family history is a bible which James inherited from his father, who had inherited it from his father:"*It is the foundation which my life is built upon. It was my father's bible and now it is mine. That is why it has been preserved and why it will continue to be preserved. [...] There is a thread to the past. [...] we have no chance of knowing them [ancestors], but they have marked my ancestors' descendants and their descendants, and their descendants, and so there is a thread to us. There's a line to the past, that's how I experience it.*" James does not use the bible, but there are written some dates for specific events in the family like weddings and christenings and names in it, so he wish to preserve it because it is a family heirloom and a connection to his ancestors.

A christening gown which Ingrid had selected is an example of an object which represent both family history and reminiscence. The gown has been used by 75-80 children in Ingrid's family, and they have made a 'book' about who had worn it through the time. Ingrid told us:" *It reminds me of my grandmother, I can remember her, and the family. And my daughter say, that it is curious that her great-grandmother sewed the dress and her mother, her self, and her children have worn it. Those are the thoughts I have, family. It means something to many people in the family.*" The gown reminds Ingrid of the christening of children in the family and of her grandmother, thus representing both family history and reminiscence.

Reminiscence

Many of our participants described how objects, in different ways, reminded them of certain periods or aspects of their life. An example of an object causing reminiscing is Jytte who showed us a painting of a beach (see figure 2.1), which she got when her mom passed away, and she described what it reminded her of:" *(. . .) and this beach, during my childhood I spent a lot of time there. (. . .) Those rocks did we always play on. Now someone have removed them. That is really really sad, I think. (. . .) They (grandparents) ran a boarding house during summers which attracted many guests. In the summer there were a wooden pier here (. . .) When I got old enough I actually had summer job there*". It is relevant to note that Jytte grew up on an Island (Als), but she moved to Jutland and have lived there since her adolescence. The painting of a location where Jytte spent a lot of time but have moved away from, are embedded with memories of both certain periods of her life, but also her family who lived there. She further told us that the painting had always been on display at her parents' home, and now in her own home as well. Jytte's children have also spent a lot of time on that beach, and Jytte told us that she was sure that her daughter had a relation to the painting for that reason.

Figure 2.3: The red vase which is always used for lilies of the valley.

Another example is a red vase Britta showed us during the second interview, which reminds her of a deceased friend (see figure 2.3). She told us that she always use it for lilies of the valley. It was also one of the objects that both of Britta's daughters wanted to inherit, but to them it reminded of their mother despite that they knew the deceased friend, as one of them explained:" *She [the mother] has always had this. I actually don't know where she got it from. [...] Lilies of the valley. It should always be used for those. [...] It [the vase] is important. It will be kept [in the family]*". The daughters did not recall the story of origin, but they both remember the vase from their childhood home and know that it is used for lilies of the valley. They both wanted to continue this use of it, which aligns with what Curasi et al. define as ritual use or display (Curasi, Price, and Arnould 2004, 617). We argue that this vase is not inalienable now, because there has not been a transfer, but there are two descendants ready to inherit it when time comes. Therefore, this is an interesting example of an object which most likely will

become inalienable because of the embedded memories which comes from Britta using the vase.

2.5.2 How are inalienable objects experienced?

We found that the inalienable objects are experienced differently than other objects. We have used the term 'caretaker' from Curasi, Price, and Arnould (Curasi, Price, and Arnould 2004) to describe the role of person who cares for inalienable objects. A caretaker takes care of an object and has certain responsibilities regarding the object. They can be chosen or targeted to become a caretaker as for example Britta, who has inherited three silver spoons which she got from her mother-in-law, who chose Britta to inherit them: " *[...] she believed I would take care of [the spoons]. Her own daughter was not interested [...] She knew that if she wanted something to be kept in the family she should give it to me, and not to her daughter.*"

Figure 2.4: A silver spoon which is used for jam every Christmas.

It suggests that the mother-in-law assessed Britta as a better caretaker. When we asked her about why she kept them, she expressed both an interest and enjoyment in keeping them, but also an obligation towards her ancestors. We were also told that Britta did not get any information or stories about the spoons when she got them, but she did some research on her and her husbands ancestry and found the story of origin, as it was important for her. Now, there is a paper note with the story written on it, stored along with the spoons. This is a technique Britta has used for several of her objects in order to preserve the stories and thereby hopefully pass them on to the next generation. Confirmed by her husband, we found that Britta often uses storytelling to pass inalienable objects on to descendants, and their daughters encourage Britta to write down the stories , as they can not remember all the stories. Storytelling as a technique was used by most of our informants, aligning with previous research (Curasi, Price, and Arnould 2004, 616).

Although Britta have told the stories of the spoons to her daughters, we found out that they could not remember the right stories about them. Nevertheless, they both expressed the importance of keeping them in the family, as one of them puts it:" *Those [the spoons] are very worthy of preservation because they are related to our family history and it should be kept in the family*

and so. But the personal feeling towards it, I don't have that. [...] those things have just been stored in the drawer". The other daughter similarly said:" *They [the spoons] will be kept and the stories will be told [...] But because I didn't know the person she got them from, it is difficult to relate it to anything* Thus, both daughters believe that the spoons are part of the family and they will keep them for that reason, but they lack relation to them because they did not know the people who owned the spoons before, and because Britta has not used the spoons as they where kept away to prevent loss. These findings are in agreement with earlier research (Curasi, Price, and Arnould 2004) suggesting that Britta has succeeded in her role as a caretaker for now, as she has prevented loss, convinced her family of the value of the spoons, and secured that there is a future caretaker. What the daughters suggest is that if Britta had used the spoons, it is more likely that they would remember the stories or at least gotten their own memories and relation to them (Csikszentmihalyi and Rochberg-Halton 1981), which would make it even more certain that the spoons would sustain their inalienability status.

Though Britta uses storytelling to pass the stories along with the objects, we found that it was a challenge for caretakers to identify the right conditions for sharing stories. As stated above, her daughters had difficulties with remembering the stories, even though Britta tells them over an over again. We found that Britta experience it like her daughters do not listen to her, as she said:"*If only they would listen when I tell them the stories [...]*". But her youngest daughter experience it differently as she told us:"*[...] and then I need my mother to write it down [...] Otherwise, I can't remember it*." And she further elaborates:"*As long as I have my parents to tell the stories, then I don't need to know more [about objects]. But when they are not here to tell them anymore, it would mean a lot to me to know more. I hate the fact that my mother can tell me a lot of things, and I know that you can ask me tomorrow, and I have forgotten everything*. Similar to Jones and Ackerman's studies (Jones and M. S. Ackerman 2021), these statements suggest that there is a tension between listeners and tellers. In this case, the teller may feel like the listeners are not motivated to listen. On the other hand, the listener seems motivated to listen, but fails to remember. The reason is not clear, but it can be affected by the fact that the parents are still alive to tell the stories, so the listener may not feel responsibility in regards to knowing the stories, as they are "preserved" with her parents. This could lead to the challenge, which she also points out, that the stories can be lost with her parents.

Futhermore we found data suggesting that it may be difficult to find the next caretaker and that it may sometimes depend on having a suitable descendant. For example, Ditte was doubting that her sons want to inherit a sewing table which she inherited from her mother:" *If they want it, but I just don't think so. They are not the ones to decide, often it is my daughter in laws [...] I definitely don't think they want it. I don't know*". This suggests that Ditte has a

challenge regarding finding the next caretaker, as she mentions that it is her daughter in laws who would take these decisions. As mentioned by Gloyn et al., to archive an object depends on the role it has played in family events, anecdotes or the connection it has to an individual in the family (Gloyn et al. 2018, p. 160). This could indicate that Ditte's sons does not see the role of the object as Ditte does, or that Ditte's daughter in law may not have a strong enough relationship to Ditte thereby not feeling the same obligation and responsibility to keep the object. This suggest that Ditte has failed, for now, to convince others of the importance of the object, and thereby have not found the next caretaker for it. Relations to an object and a feeling of obligation towards keeping it in the family is important for a person in order to become a caretaker (Curasi, Price, and Arnould 2004, p. 618).

Therefore, being a caretaker can also be a burden, which can affect the caretaker when trying to curate the inalienable objects. For example, when we gave Britta the task of pointing out objects in the room that she wished her descendants to keep, she expressed difficulties in doing so, because she was concerned about making them keep objects they did not want to keep. Especially when we talked about passing on larger objects, she was not as clear in her wish, because she was aware that it would be more difficult for her family to find the room for it. She did not want to burden them. Similarly, when asking another participant, Jytte, about passing objects on to her descendants she told us:" *She [her daughter], says yes to everything, so I don't ask her that much anymore [...]*, suggesting that Jytte thinks that her daughter already has said yes to a lot of things, and might feel responsible to do so, resulting in Jytte being reluctant to keep asking.

In our data we also found examples of objects which may be inalienable, yet it seems like the caretaker finds it difficult to keep the object in the family. These are for example a tractor which is too big for the children's homes, and trees which can not be moved. The participants seemed like they had accepted the fact that these objects could not stay in the family, and that they did not want to burden their children with these objects.

2.6 Summary

Based on the interviews we believe that some of the objects that the participants presented to us are inalienable, and we found that those objects represents either family history, reminiscence or both. For an object to become inalienable, there must have been a transfer of it, meaning that only heirlooms can be inalienable. Our definition of heirlooms, is that it is an object that has been given or inherited from an older generation to a younger. The transfer is important because we found that the inalienable objects have a caretaker which is different from a typical owner. We argue that an owner feels free to do with the object as they please, but a caretaker is aware of that other people, dead and alive, have feelings for the object and knows that loss of the object would affect them too, which is similar to Curasi, Price, and

Arnould's study (Curasi, Price, and Arnould 2004, 610).

We also argue that the caretaker can be a caretaker for some objects, and not others, therefore, a family can have several persons acting as caretakers for different objects. Based on these findings we argue that the inalienability status of an object depends on a caretaker because it is linked to the way the person experiences the object. Our data agrees with the studies of Curasi, Price, and Arnould, who found that a caretaker is responsible for passing objects forward along with the stories and the rituals regarding the use, display and maintenance of it (Curasi, Price, and Arnould 2004, p.609).

Based on our data we agree with Curasi, Price, and Arnould in following three overlapping and interdependent responsibilities of a caretaker: A caretaker must 1) prevent the loss of the object, 2) convince others of the importance of the object, and 3) find the next caretaker. An object can not reach the status of inalienability without a caretaker who lives up to these responsibilities. However it is important to stress that this does not necessarily mean that a caretaker succeeds in creating or maintaining inalienability for an object (Curasi, Price, and Arnould 2004). This leads us to to defining the responsibilities a caretaker have:

Caretakers responsibilities:

- Prevent loss of the object
- Convince others of the importance of the object
- Finding the next caretaker
  - Means to convince others:
    - Share stories about the object
    - Use or display the object

We believe that part of preventing loss of an object is to find a new caretaker. To find a new caretaker, the current caretaker must convince at least one more family member about the importance to keep the object in the family. In order to convince others about the importance, the caretaker can share stories about the object. Furthermore, use or display of an object reflects the status of it, which can also help convince others and create relations to new generation as they gets to experience the object and create new memories with it. In this project, we therefore focus on accommodating the caretakers responsibilities by focusing on storytelling and use, as those are means to fulfill the other responsibilities.

In this section we have gained an understanding of our problem area through the findings from our data analysis. We have identified inalienable objects to be dependent on a caretaker

who lives up to the responsibilities in order to take care of inalienabile objects. Having identified our challenges and the needs of a caretaker we continue by generating ideas for potential solutions to accommodate their challenges in the next chapter.

Chapter 3

Envisionment

Based on our understanding of the problem area we will in this chapter present some examples of different design ideas which we came up with during our sketching phase. This chapter will therefore present a figure of our problem area followed by a reflection of our envisionment phase here we will explore possible design ideas through visualisation techniques. As the envisionment process serves to make ideas visible and settle on design ideas, it is closely connected to the evaluation phase as it is important to evaluate all kinds of visualisations of the system (Benyon 2013, p.167). The goal of this chapter is to develop design ideas that accommodate the users needs within the problem area.

3.1 Design context

As a tool to better understand the context in which we are designing a system, we decided to draw a figure which illustrates the caretakers' responsibilities and means used to convince other as we found in 2.6. The illustration can be seen in figure 3.1.

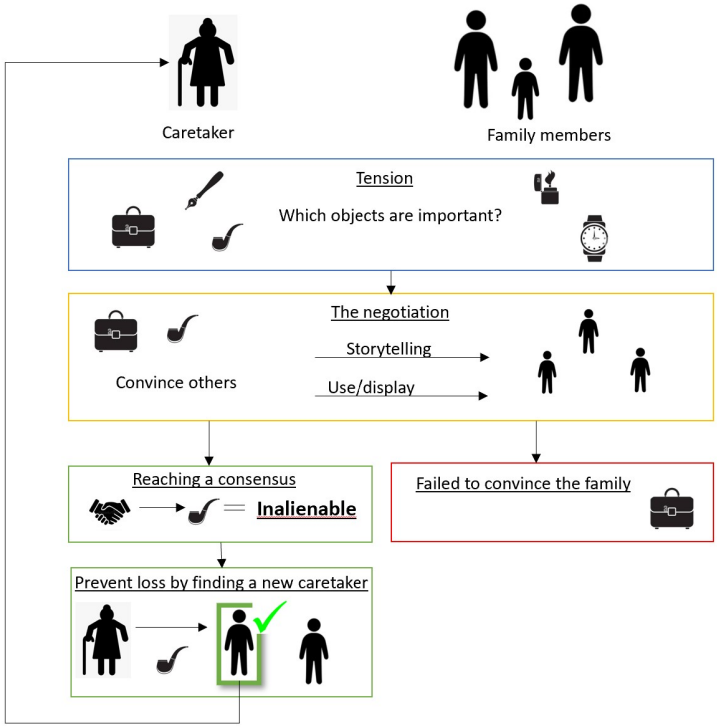

Figure 3.1: Inalienable Activities

The figure illustrates a family with a caretaker on the left side and family members on the right. As seen in the first square we have identified a tension between the caretaker and family members where they need to agree on which objects are important to the family. In the next section of the figure we identified a negotiation process. The caretaker could use the pipe and bag, tell stories about them or both, in an attempt to convince the family of the importance of keeping it in the family. This negotiation has two possible results; 1) At the left of the figure the caretaker succeeds in convincing at least some of the family members about the importance of the pipe, it therefore becomes inalienable where after a new caretaker is found. When the new caretaker is found the process will start over sooner or later. 2) The right side illustrates that the caretaker did not succeed in convincing the family of the importance of the bag and it is therefore in risk of being disposed when the current caretaker can not have it anymore.

3.2 Sketch

Having identified the design context of our project, we decided to visualise and conceptualize ideas which can accommodate the caretakers' responsibilities (see fig 3.1). According to Benyon one of the difficulties of working with the envisionment activity is that it is about elaborating and exploring different design possibilities while reducing and formalizing them at the same time (Benyon 2013, p.12). Therefore, we used a sketching method as a communication tool to generate and evaluate different design ideas. A sketch is a simple drawing and is a quick way to visualise ideas and identify design features. We also used storyboards, which is a type of sketch that captures the flow of an experience and present possible user interactions (Benyon 2013, p.169).

Our sketching process was inspired by Bill Buxton and his description of Pugh's sketch funnel (Buxton 2007, 148). The funnel was created to make designers understand that a sketching process is about adding and eliminating concepts until a final design has been selected. Pughs's sketch funnel is very iterative and consist of these three phases (Buxton 2007, 148);

The first phase is called the exploratory phase and serves to explore multiple ideas and concepts which are sketched based on an overall concept or goal. The second phase is called the clarification phase and serves to eliminate or further explore sketch ideas and concepts generated from the previous phase. The third phase is called the resolution and also serves to eliminate or further explore sketch ideas and concepts based upon the previous phase. In difference to the other phases the result of the resolution phase is a final sketch that represents the final ideas and concepts that accommodate the overall goal. (Buxton 2007, 148)

In the following section we will present our sketches which will be structured in accordance to the phases in Pugh's sketch funnel. We will present the sketches which we found raised the best discussions in regards to design ideas. Each section starts off with the point of origin for the specified sketch phase.

3.3 Point of origin

Before beginning our sketch phase, we agreed on discussing what challenges to focus on in regards to supporting the caretaker in taking care of objects. An issue we found in our understanding phase was that objects are often hidden away, e.g. because they are difficult to use, or are worn out. We found that family members find it difficult to get a relation to an object they do not interact with or even know about (Csikszentmihalyi and Rochberg-Halton 1981). Likewise, it can be difficult for the caretaker of such an object to convince others of the importance, because they can not reflect the status of the object by displaying it, and it can be

difficult to find a time for telling stories about an object which is hidden away.

3.4 The exploratory phase

To initiate the exploratory phase we began sketching based on the point of origin.

Caretaker Quiz

The idea of a quiz was generated to accommodate the negotiation process where caretakers convince other family members of the importance of objects, as seen in figure 3.1. The idea incorporates playful interactions between the users as preferred by some family members concluded by Kirk et. al (Kirk et al. 2010, 262).

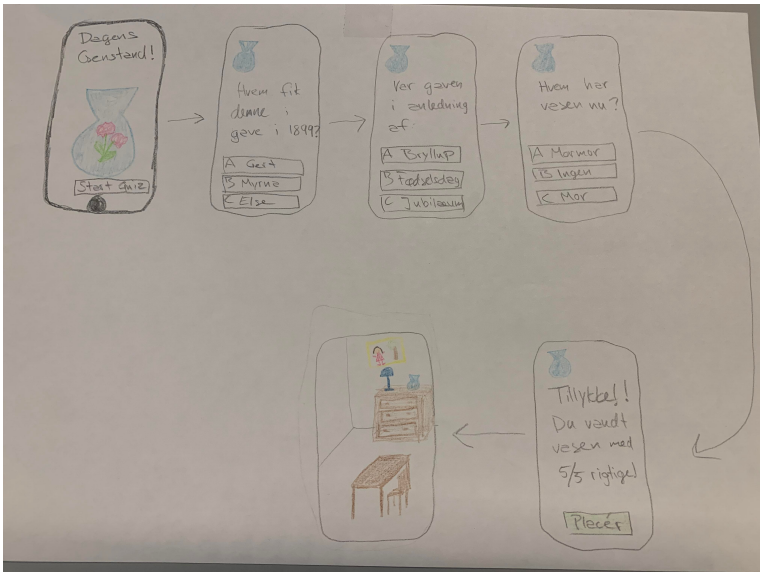

Figure 3.2: Caretaker Quiz

Sketch 3.2 represents the idea of a family quiz, that allows members to quiz about important objects within the family. The idea is that a mobile app presents an 'object of the day' with some corresponding questions. The questions are composed of facts and stories regarding the object, thus incorporating possibilities for the caretaker to give information about the object to the family members. If a member gets the answers right, they win a virtual representation of the object, which can be placed within a virtual home together with other virtual objects which they have won through the quiz. This was a way to incorporate use of the objects, allowing family members to imagine and try placing those objects in a context of the home, which could engage them in inheriting certain objects. Though it could also engage the family members in knowing more about the family objects to win certain objects for their virtual home.

3D artifacts

As described with the caretaker quiz we also discussed a different way of connecting memories and family history to objects while also incorporating the concept of tangible memory as presented in the studies "If these walls could speak" and "Slots-momento" (Mosher 2017) and (Li et al. 2019).

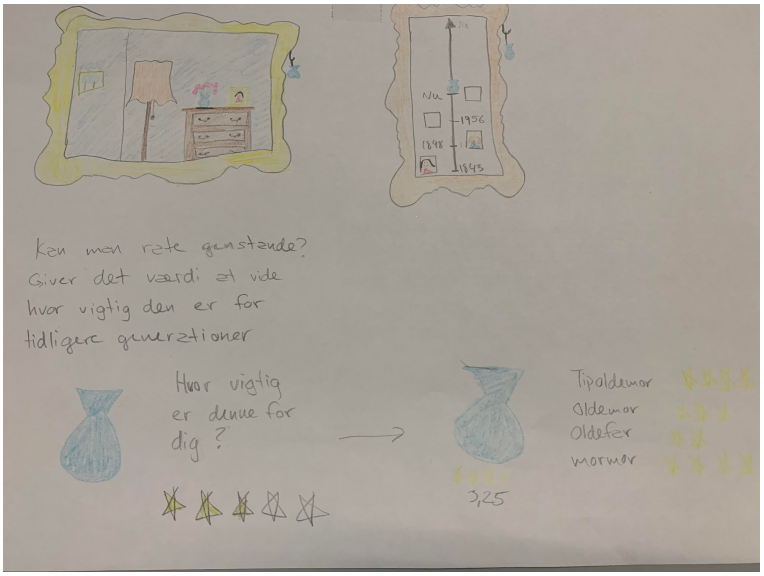

Figure 3.3: Final design idea

The idea is to create a 3D replica of the inalienable object as seen in sketch 3.3. In the replica there is a chip that can be detected by censor in the picture frame. The first frame in the sketch displays pictures of the original object in a specific context or when being used. The next frame displays the timeline of the object attaching information such as year of origin, special events it has been used in etc. Every family member can have a 3D replica and has the opportunity to rate the objects in accordance to how important they find it. The idea was that if you know that e.g. your grandmother find an object important, it may affect the way other family members interpret it, thus accommodating the tension (see figure 3.1).

This idea would enable that everyone with an interest could have a 3D replica of the original object. This 3D replica would also give members access to the family history and the pictures associated to it. Though it was a fun idea it made us realize that we would provide users with another object which they have to keep and store while also giving a possibility that focus may be taken away from the real object.

Registering objects together

Another idea we came up with was developed as we wanted to promote storytelling through social interactions as stories often are a co-construction between family members (Jones and M. Ackerman 2018, p.10). Furthermore stories are an important tool in the negotiation process (see figure 3.1). We also believed that the social aspect would be a great tool as inalienable objects depends on multiple people forming relations to the object, as we stated in our findings (see section 2.5).

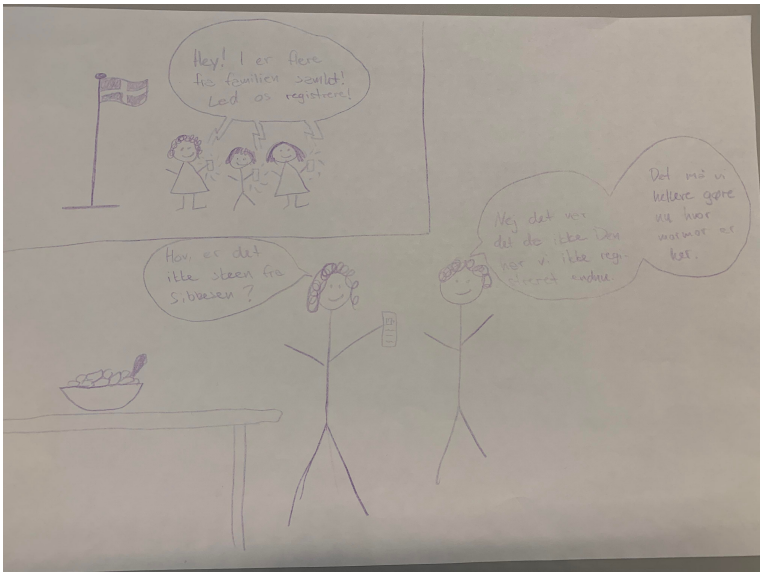

Figure 3.4: Registering objects together

The idea in sketch 3.4 shows a family that is gathered to a birthday party. Their phones give them a notification which indicates that there are enough family members together to register objects. The family members then finds a spoon which they agree to register, as they start the registration process they start to tell stories and share knowledge about the object.

The idea that several family members should be together for registering were to foster the negotiation by creating a space for storytelling (see figure 3.1). Furthermore, the idea was to preserve the stories in some way, related to the registration of the object.

3.5 The clarification phase

Based on the exploratory phase we started to figure out what design features we liked and which ones we did not like. We liked the idea of giving the caretaker and family members the opportunity to rate objects as explored with '3D artifacts'(sketch 3.3) and 'registering objects together' (sketch 3.4), as we believed these were great features to support the caretaker in identifying inalienable objects. We also discussed the opportunity of having stories and facts saved as seen in '3D artifacts'(sketch 3.3) and 'caretaker quiz' (sketch3.2), as we explore the possibility to preserve the stories of the objects. We did consider implementing a playful element, but did abandon it as we believed it would be more engaging to other family members and thereby removing our focus from the caretaker.

We also wanted to further explore how to create tangible memories, but we discussed that having 3D replicas could pull the focus from the original object so this aspect needed further explorations. We wanted to further explore the idea of developing a system which may be easy to integrate in the everyday life as with the digital picture frames as seen in 3.3. In this phase we also focused on incorporating use of objects in different ways.

Ritual use

The next idea was inspired by the 3D artifact idea (sketch 3.3), and the idea of making a system that is a part of the everyday life. It was also inspired by reflecting upon how we may implement social interactions as a mean to help the caretaker in revealing what objects they want to pass on.

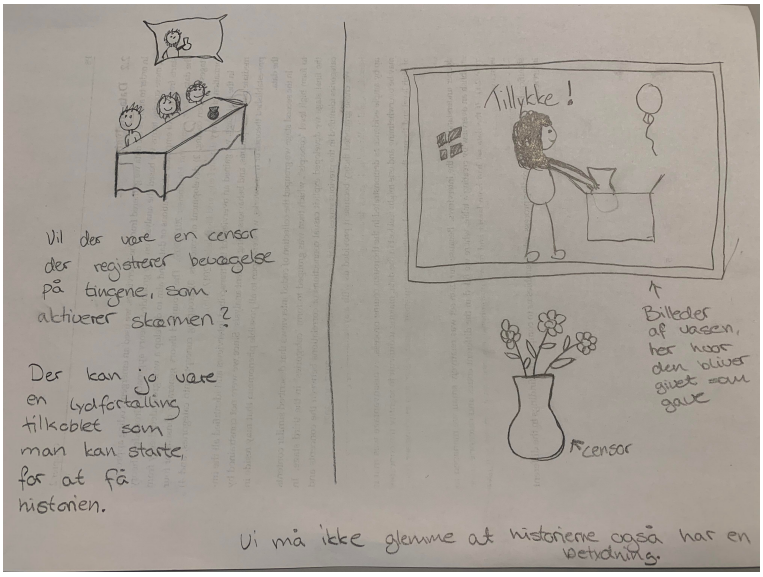

Figure 3.5: Ritual use

The idea seen in sketch 3.5 shows an object that has a censor attached to it, whenever it is being used, pictures of the object will appear. The censor is placed by the caretaker on objects that are inalienable which they want others family members to notice.

In this way, the caretaker could draw attention to inalienable objects, and we believed it was a way of creating room for storytelling as the users only has to be aware of a digital picture frame, instead of being engulfed in separate phones. This idea could also accommodate use of objects, both by drawing attention to certain objects when being used, but also by the ability to share picture of different use or surroundings with the object.

Digital picture frame

Like the Ritual use idea (sketch 3.5), the next idea also came from a consideration on how we may build a system which is a part of the everyday life while also supporting the caretakers by focusing on the display of inalienable objects as this is a tool used in the negotiation phase (see figure 3.1)

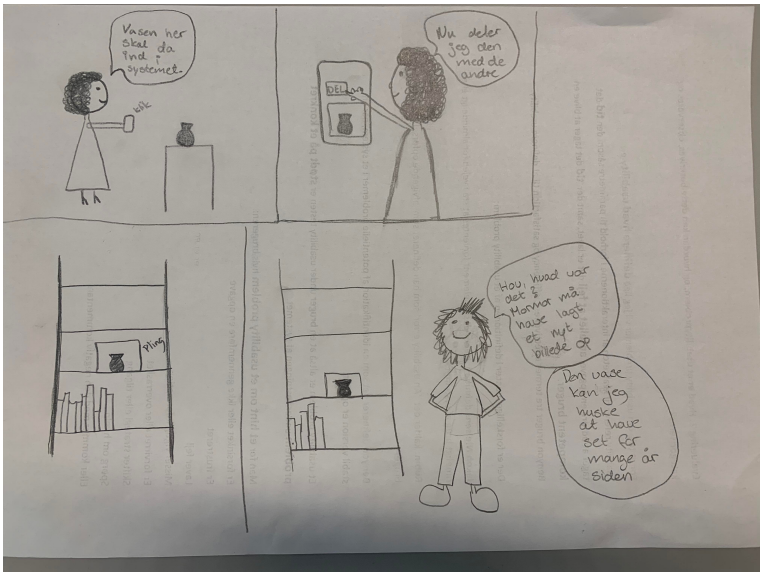

Figure 3.6: Digital picture frame

The idea in sketch 3.6 shows a caretaker taking a picture of an object which they want to register within the system. The caretaker wants to share the objects with other family members and therefore presses 'share'. A Digital picture frame is setup in other family members households, which is attached to the mobile application. Whenever the caretaker presses share the digital picture frame gives a signal and displays a picture of the recently registered object. Other family members can then see what the caretaker has put on display.

This idea uses display to help the caretaker convince others of the importance, and gives the caretaker the opportunity to display objects which otherwise are hidden or not used. This could also promote social interactions as family members may generate some curiosity to the displayed object which may cause conversations and thereby enforce storytelling.

3.6 The resolution phase

The resolution phase seeks to further explore consideration from the clarification phase (see section 3.5). This phase will conclude in a final design idea. To initiate this phase we settled on decisions and consideration explored in the previous phase, that accommodate the caretaker in displaying hidden objects while also helping them by creating room to initiate conversation related to the object.

We liked the idea of creating room for storytelling without demanding that the users have to be together as seen in (sketch 3.5). A concern which we had with both ideas in the clarification phase was that none of the ideas saved the objects along with information which

disables the users in preserving them. We found from our interviews that there was a desire to preserve information, because the receivers of objects had a hard time remembering all the information and stories they were told by the caretakers. Therefore, we want to incorporate archival practices to some extend in our system in order to preserve information and stories along with the objects.

3.6.1 Final design idea

To accommodate the challenges of creating a room for storytelling, we agreed to pursue the idea of implementing an insinuation that has the potential of creating room for conversations and storytelling in relation to the object as seen in sketch 3.5.

We also believed that design ideas we explored in 'The digital picture frame' (sketch 3.6) could support people in see and form a relation to objects hidden. As we explored how to accommodate the concerns we had, we started to draw the same sketch idea.

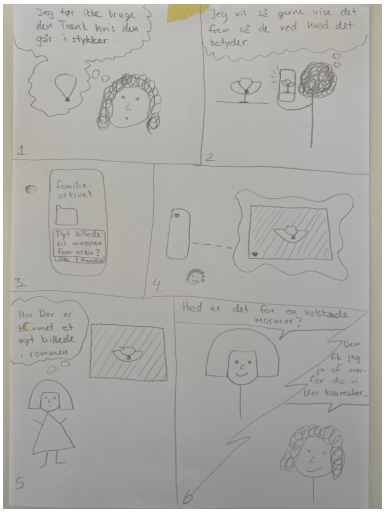

Figure 3.7: The Digital picture frame

What we visualized in sketch 3.6 is a person who is afraid to use a necklace because it could break, but still wishes to use it in order demonstrate to other people what it means to her. She therefore takes a picture of it with her smartphone and uploads it to a folder in a "family archive" on the phone. The smartphone and frame are connected through wi-fi which makes it possible to show the uploaded picture on the frame. Another family member, who also has such a picture frame, discovers the picture of the necklace on it and calls the owner/caretaker to ask about the necklace. This provides an opportunity for the caretaker to tell stories about it while it is the family member who encourage it.

This idea includes both the opportunity to register and present an object as every story and picture related to an object can be preserved and pictures can be presented. It also provides a way to draw attention to objects which otherwise would be hidden or kept from use, while not excluding any objects.

3.7 Summary

In this section we have presented our sketching process in accordance to Pugh's sketch funnel. To initiate the sketching phase we found an issue in understanding where we identified that the caretaker trouble with showcasing hidden objects and initiate a conversation and storytelling about these objects With this challenge in mind we started to generate multiple sketches.

The last resolution phase made us agree on an overall design idea that enable preservation of stories associated to the objects but also allowed the display of both hidden and used objects. With this in mind we moved on to design phase.

Chapter 4

Design

As we have come to an agreement on a design idea, we move on to the design activity. This phase has the purpose of settling on the conceptual design of the system which consist of figuring functionality and goals of the system. Furthermore the design chapter also presents the physical design which consist of the graphical user interface and how information should be presented to the users (Benyon 2013, p.53). The main purpose is therefore to present decisions regarding functionality and the structure of the communication between the environment and the system (Sommerville 2016, p.199).

4.1 Familiearkivet

We agreed to focus on supporting the caretaker with a design idea that allows caretakers to register inalienable objects. With a focus on those that are usually hidden while also allowing these to be on display in a picture frame (see sketch 3.7).

We have decided to develop a system that allows the caretaker to register and preserve information and stories about objects. Furthermore, it allows caretakers to display objects, which are otherwise difficult to display to other family members. This section will therefore present our overall design consideration to the system we have decided to call - Familiearkivet.

In order to enable preservation of stories associated to the objects and also facilitate the display of objects we have implemented two elements:

- A digital picture frame that displays pictures of inalienable objects, and serves as a communication tool between the caretaker and other family members which we view as receivers.
- An app for smartphones where caretakers can register inalienable objects. The app also allows receivers to read about the chosen objects.

4.1.1 Mobile application

The app allows caretakers to register objects so they can be shared with other family members. We will accommodate this goal by:

1) Allowing the caretaker to upload one or more pictures of the object, as this work as a representation of the original objects.

2) Prompting the caretaker to fill in basic information about the object. The type of information we will include is derived from what we found to be relevant for caretakers and receivers to know about inalienable objects (see section 2.5). This will include - type of object and current owner as these help to identify the object and who in the family who currently possess it in order to emphasize that the object is being kept by a caretaker who is not the original owner which a premise for the inalienable status(see section 2.5.2). Furthermore we also prompt the caretaker for information of the year of origin and first owner in order to establish family history (see section 2.5.1). In addition to these information, we should also make room for additional information of the object. Allowing the caretaker in writing stories or memories related to the object to further promote the importance of the object and to include reminiscence (see section 2.5.1).

3) Recording stories about the object. Using audio will allow caretakers to save stories about the objects and would spare our users in writing the stories down. It is also for accommodating timing challenges (Jones and M. S. Ackerman 2021), as it will enable caretakers in telling stories when they have time for it, and allow receivers to listen to them when they have the time. We also considered this to add relation to an object by listening to the caretaker rather than just reading. This was also found to be favorable among users in the study of the memory box (Frohlich and Murphy 2000, p.240).

4) Showing a list of all the registered objects. As Familiearkivet is a tool for the caretaker to take care of inalienable objects, we need to enable others in seeing the registered objects. All family members have a shared list of all the registered objects in the family.

4.1.2 Digital picture frame

The picture frame has the purpose of displaying inalienable objects that has been chosen by the caretaker. To achieve this goal we want to implement the ability for caretakers to present pictures of inalienable objects. This has the intention of being a communication tool to display objects to reflect their status (Curasi, Price, and Arnould 2004; Gillis 1997). We believe that this may also create room for conversations about the object which Jones and Ackerman argue needs to be facilitated when creating a system that accommodates storytelling (Jones and M. S. Ackerman 2021).

4.2 Actors

In order to move forward from the proposed design consideration, we need to establish boundaries for the system and understand the interactions of the system with its environments (Sommerville 2016, p.199). To explore this we modelled the interactions using a use case model as seen in figure 4.1 and 4.2. Each use case represents an interaction with the system (Sommerville 2016, p.200).

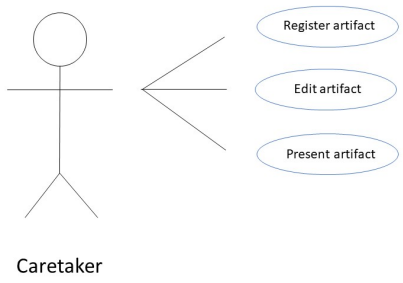

Figure 4.1: Use cases

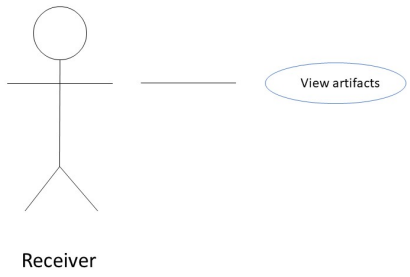

Figure 4.2: Use cases

We have identified two types of user - a caretaker (see figure 4.1) and a receiver (see figure 4.2). We have decided to use the word "Artifacts" instead of objects as we move on to conduct implementation activities where objects have a different meaning. Therefore a caretaker can register artifacts, edit artifacts and present artifacts within the system.

This functionality has been identified based on what was needed in order to accommodate the design consideration in section 4.1. As the caretaker relies on other family members to convince, we have also identified a receiver. This user uses Familiearkivet to gain knowledge of the registered artifacts and can therefore only view artifacts.

It is important to state, that though we distinguish between these two types of users a person can have both the role of being a caretaker and a receiver, as a person can be caretaker of some artifacts while being a receiver of other artifacts.

4.2.1 Use cases

Having established the users within our system, and their needs, we want to explore and assess the capabilities of our system. We have chosen to look into the different functionality through use cases. The following section will be structured in accordance to the use cases (figure 4.1 and 4.2). Each use case is presented with an identification of which actors can perform the use case followed by what data that is expected to be processed. In addition we have also identified the stimulus which is what urges the action to happen along with what the response of the system should be when the action occurs. We have also added a comment, which reflect other considerations in relation to the use case.

Use case	Register Artifact
Actors	Caretaker
Data	A caretaker registers an artifact in the system. They can add information about what type of artifact it is, year of origin, who the first owner of the artifact was, who the current owner is and other information if they have that. Furthermore, the caretaker can add a photo of the artifact by selecting it from the gallery on their smartphone, and they can add an audio file by recording it when registering an artifact.
Stimulus	The caretaker request to the app to save the data they filled in.
Response	The app is connected to a database where it stores the data filled in by the caretaker.
Comment	To select a photo and to record audio, the app need permissions by the caretaker to open gallery and/or use the microphone on the smartphone.

Table 4.1: Use Case - Register Object

Use case	View artifacts
Actors	Receiver
Data	A receiver can see a list of all artifacts, providing a picture and the type of artifacts for each of which have been registered into the app. Furthermore, the caretaker can choose an artifact to see all the information that have been registered.
Stimulus	The caretaker request the app to show a list of registered artifacts.
Response	The app retrieves the data from the database and shows it.
Comment	Artifacts are registered and saved in a shared online database so all the devices in one family have access to all the registered artifacts within that family.

Table 4.3: Use Case - View Object

Use case	Edit object
Actors	Caretaker
Data	The caretaker can choose an object and edit all the information that have been filled in.
Stimulus	The caretaker request the app to show the information of the registered object that is chosen. When the caretaker has finished editing, they can request the app to save the changes.
Response	The app retrieves the data from the database and shows it. When requested to save the data, the app send the new data to the selected object to the database.
Comment	

Table 4.5: Use Case - Edit Object

Use case	Present object
Actors	Caretaker, picture frame
Data	The caretaker can choose an object to present on the picture frame. It is only the photo of the object which is being presented.
Stimulus	The caretaker request the app to show the object on the frame. The frame is reacting to change in the database.
Response	The picture frame request the database for the picture of the object chosen by the caretaker.
Comment	

Table 4.7: Use Case - Present Object

We found from our understanding phase that people's memories of an artifact can differ and some may have additional information about an artifact. Therefore, we wanted to enable users to share their knowledge by being able to edit and add information to objects which other family members have registered. We therefore decided not to incorporate any user restrictions to investigate if and how the users would add information to other registered objects.

4.3 Graphical User Interface

As we have established functionality, we began to settle on the design of the user interface (UI). The UI is what the user comes into contact with when interacting with the system and is therefore an important part of a system. Getting the right UI can be a difficult process and often happens to be an iterative process of evaluating possible suggestions (Benyon 2013, p.256). To accommodate a good UI is also to consider and evaluate the navigation as it dictates how the information in the system is presented to the user (Benyon 2013, p. 551). In order for us to get an overview of how to design our UI and coordinate our navigation we chose to start by drawing on a whiteboard. This made it possible to discuss and evaluate the design of our UI elements and navigation opportunities. The final result was implemented in our system, and is presented in the following section.

Landing page + Create Artifact

We started by implementing a landing page where the user is introduced to the system with a small description of Familiearkivet's intention.

The first image shows our landing page leading to the registration page that accommodated the register objects use case (see table 4.1).

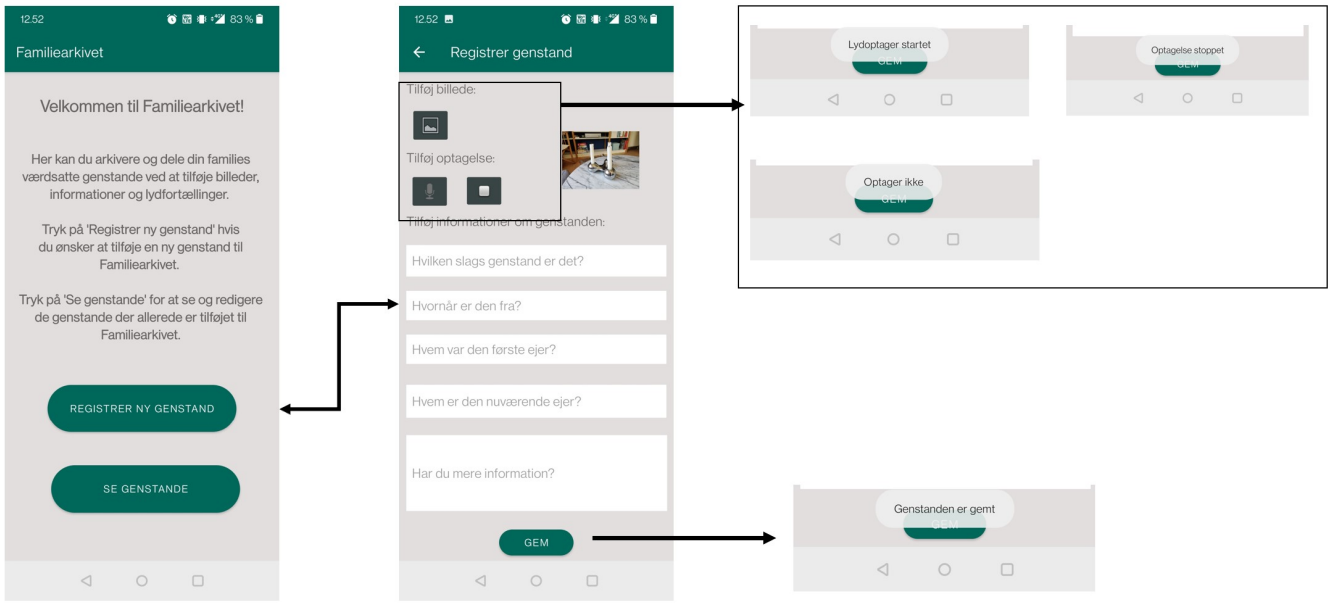

Figure 4.3: Landing page + Register objects

As seen on figure 4.3 the landing page presents text to the user informing them on how to use the application. Below the text we have created two buttons which navigates the user to either 'Register new artifacts' or 'View artifacts'. When the user presses 'Register new artifacts' they navigate to the next pages as presented by the arrow on figure 4.3.

On the next page the user can to register an artifact, this is implemented through different uploading functionality where the user can select a picture, record audio and fill in text information about a certain artifact. For the user to upload a picture, we have implemented a button showcasing a gallery-icon. When it is pressed the user is directed to their own gallery on their smartphone where they can select an image. When the user presses accept, the picture is uploaded and displayed in the app for the user to see.

If the user wishes to upload audio they can press the microphone icon to use the phones microphone to record. When the user is done they can press the stop-icon beside it to stop recording. This action will create an audio file which gets uploaded along with picture and text information when the registration is saved. To indicate that the user is recording, we have created toasts, which is a simple feedback that generates a small pop up with a message. As seen in the last frame in figure 4.3 we have created three feedback toasts associated to the audio button. One informs the user that the recording is started, another one informs the user that the recording has stopped. The last one only appears if the user tries to stop the recording without it ever being activated and informs the user that it does not record.

In order for the user to provide information to the uploaded artifact we have created five text fields for the user to fill out which can be seen in the middle frame in figure 4.3. The input fields prompts the user for the type of artifact, year of origin, first owner and the current owner. Lastly the user can add additional information.

Lastly, we have implemented a save button which saves the information about the artifact and automatically navigates the user to the landing page again. Additionally we have created a toast that informs the user that the artifact has been saved as seen in the last frame in figure 4.3.

Landing page + View Artifact + Edit Artifact + Present Artifact

If the user chooses the 'View artifacts' button from the landing page they will be navigate to the view page, where they have a list of all created artifacts. From there they can perform the task of either view, edit or present an artifact.

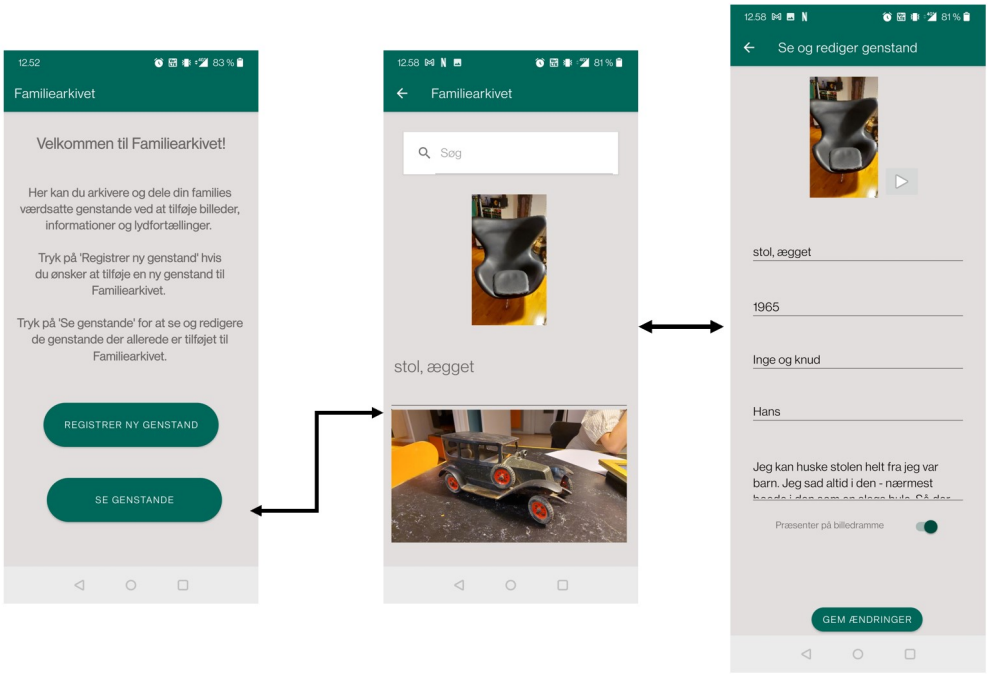

Figure 4.4: View artifact + edit artifact + present artifact

Figure 4.4 shows the landing page again, but shows what happens when the user presses the 'View artifacts' button. The artifacts are represented in a list with a picture and its title/type which implements the view use case presented in table 4.2. We have also implemented a search function which helps the user in searching for a certain artifact. When the user presses an artifact they are navigated to the second page shown in figure 4.4. From here they are presented with the image of the artifact, play-button and five text fields. Next to the image is a play button where the user can play the audio file uploaded to the artifact. The five text fields shows the registered information about the artifact. To implement the edit artifact use case as seen in table 4.4 we have made the text fields editable in order for the user to correct or add information associated to the artifact. The changes are saved when the user presses the 'Save changes' button. This will create a toast that informs the user that changes have been made.

In order to inform the system of which item should be presented as described in the use

case 'present artifact' (see table 4.6), we have implemented a switch which has been placed just above the 'save changes' button. The user can press it to present the current artifact on the picture frame.

Present Artifact

As described in use case 'present artifact'(see table 4.6), we have a picture frame that displays the artifact which the user chooses through the app.

Figure 4.5: Final Design

In figure 4.5 we have implemented the functionality of a picture frame in a tablet. Though it is a tablet, we have crafted a frame of oak to make the tablet resemble a picture frame to prevent the user from using it like are regular tablet. The functionality to this the picture frame is to display pictures of the artifacts the caretaker has chosen. The picture frame shows the object which is chosen to be presented in the app. Whenever another user wants to present an artifact, it overrides the current picture. All the picture frames in the family shows the same picture. In order to accommodate that we have created an image view and implemented a function that removes the navigation bar while also implemented a function that prevents the tablet from going into stand-by mode which allows the caretaker and receiver to view the image at all times.

Chapter 5

Implementation

In this chapter we describe how we implemented the design and functionalities of Familiearkivet. We decided to build our system for Android devices as it is the most popular mobile platform in the world (Griffiths 2017, p.2). Android Studio is the official Integrated Development Environment for Android app development (*Meet android studio | android developers,*). In Android studio you define the layout of each screen in the app which we did in Extensible Markup Language (XML). The layout may include GUI components such as text fields and buttons (Griffiths 2017, p.2). To define what the app should do, we use activities. An activity is a Java class that defines what the components in the layout should do. It e.g. define what should happen when the user presses a certain button. All activity classes extends the Activity class (Griffiths 2017, p.2). The Activity class is a class designed to keep track on what happens when a layout is created and displayed.

In addition to the code that runs locally on the devices, we need an online database which the two apps has access to, in order for the users to share the registered objects with each other. We decided to use the service Firebase which is easy to connect to projects in Android Studio (Moroney 2017, p.12).

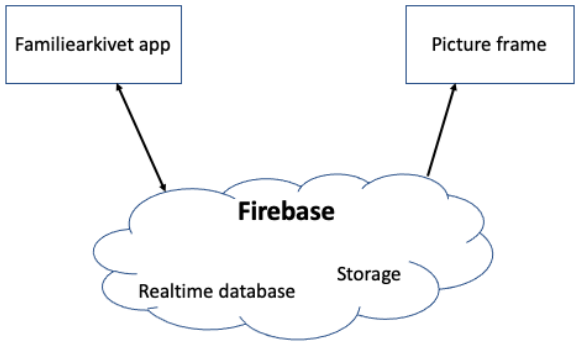

Figure 5.1: An overview of components in Familiearkivet

Figure 5.1 shows how we decided the three elements should interact. The app sends and receives information to and from Firebase, while the picture frame listens to changes in the database and retrieves images from the storage.

5.1 Firebase

Firebase Realtime Database is a cloud-hosted NoSQL database, that makes it possible to store and sync data between users in real time(*firebase realtime database | store and sync data in real time,*). The data in the Realtime Database is stored as JSON (JavaScript Object Notation)(*firebase realtime database | firebase documentation,*). JSON is a lightweight data-interchange format. It is easy for humans to read and write and easy for machines to parse and generate (*json_2022,*). Because we also have to store and retrieve pictures and audio in our apps we used Firebase Cloud Storage. When an artifact is registered with a picture and audio file, the files are uploaded in the cloud storage, and a link to the files is inserted in the Realtime Database under the specific artifact.

Code snippet 5.1 shows how we upload an audio file to the storage and saves a reference to the file in the database. The timestamp for the time of upload is used as the file name on line 3, to make sure that the name is unique. On line 4 the reference to where the audio file should be placed in Firebase Storage is created. We have chosen to place all audio files in one folder and the pictures in another folder, because it will make it easier for us to look through the data after the test. On line 5 the file is uploaded to the position we just created. On line 6 we create an OnCompleteListener procedure which is executed when the upload is completed. On line 10 and 11 the download link to the newly uploaded audio file is saved in the variable `audioReference` and inserted in the Realtime Database under the specific artifact which the audio file belongs to.

```
1  private void uploadAudio(){
2      Database storageCall = new Database();
3      String fileName = System.currentTimeMillis() + ".3gp";
4      StorageReference storageReferenceCall = storageCall.
         ↪ storageconnectionRefefrence("Audio/" + fileName);
5      storageReferenceCall.putFile(Uri.fromFile(new File(audioFileName)
         ↪ ))
6      storageReferenceCall.getDownloadUrl().addOnCompleteListener(new
         ↪ OnCompleteListener<Uri>() {
7  (...)
8  @Override
9  public void onComplete(@NonNull Task<Uri> task) {
10     String audioReference = task.getResult().toString();
11     databaseCall.databaseconnection().child(String.valueOf(maxId)).
         ↪ child("audioReference").setValue(audioReference);
12             }
```

```
13      }
```

Listing 5.1: Example of how we upload a audio file to Firebase Storage

In the following we will describe some code snippets from Familiearkivet in order to present how we developed it.

5.2 Create and save artifacts

As mentioned above the activity classes in Java define what the GUI components of each scene should do. In the following we give an example of a GUI component and the activity behind it. The example is the save changes button on the "view objects" scene (see figure 4.3). Code snippet 5.2 is the passage from the XML file which defines the "gem" (save) button on the `create artifacts` scene. On line 2 we assign an ID to the button. From line 3 to line 9 we define the size of the button and its position in the scene. On line 10 we define the method to be called when the button is pressed by the user. This is the design time way of defining an onClick method. It is also possible to attach an activity to to a GUI component in run time by making a reference to the ID assigned on line 2. The caption of the button is assigned on line 11.

```
1        <Button
2            android:id="@+id/Save"
3            android:layout_width="131dp"
4            android:layout_height="wrap_content"
5            android:layout_below="@+id/storyInput"
6            android:layout_marginStart="140dp"
7            android:layout_marginTop="20dp"
8            android:layout_marginEnd="140dp"
9            android:layout_marginBottom="57dp"
10           android:onClick="save"
11           android:text="Gem" />
```

Listing 5.2: Example of XML code, for the save button

If we take a look at the method behind the save button (see code snippet 5.3) the "save" method is the one we assigned as the onClick method on line 10 in code snippet 5.2.

```
1 public void save(View view) {
2         EditText editType = (EditText) findViewById(R.id.typeInput);
3         String typeArtifact = editType.getText().toString().trim();
```

```
4       [...]
5          Boolean switchPresent = false;
6          uploadFile();
7          uploadAudio();
8          Artifacts saveArtifact = new Artifacts(typeArtifact,
               ↪ yearArtifact, firstOwner, currentOwner, textArtifact,
               ↪ "", switchPresent, id);
9         databaseCall.databaseconnection().child(String.valueOf(maxId +
               ↪ 1)).setValue(saveArtifact);
10         Toast.makeText(Create_Activity.this, "Genstanden er gemt",
               ↪ Toast.LENGTH_LONG).show();
11      }
```

Listing 5.3: The save method on the create artifact activity

In this method we get the user input from the "EditText" editable text fields, as shown in line 2 and 3 where we retrieve the input from the field for the artifact type. In line 2 we identify the the GUI element by searching for it using its ID (defined on line 2 in in code snippet 5.2) and the `findViewById` method. In line 3 we get the text from the `editType` object by using its `getText` method, and assign it to the `typeArtifact` string. We do the same for the other text fields on the "create object" scene (not shown in the code snippet). On line 5 we initialize the Boolean which determines if the picture is displayed in the picture frame or not to false. On the lines 6 and 7 we call the methods to upload the picture and the audio recordings to Firebase Storage, the `uploadaudio` method is described in code snippet 5.1. We create a new object of the class "Artifacts" on line 8 and assign the values retrieved from the input fields to the new object. On line 9 we insert the new artifact in the Realtime Database.

In order to create an ID for each artifact we have created a method to provide the current id of the last artifact in the database called `maxId`. The method counts the children in the database, we then add 1 to create the next number in line, as seen on line 9 in the code snippet. Although this works, it has created some issues, as two users cannot register objects at the same time, because both apps count the number of children in the database at the same time and therefore assign the same number to the two different artifacts, which means that one registration will override the other. Another problem with the way we assign IDs is that it is not possible to delete artifacts because it makes the ID numbering go out of line. Finally we display the text "Genstanden er gemt" to the user on line 10 to confirm the upload, as seen in figure 4.3.

5.3 List of registered artifacts

As shown in figure 4.4 we have implemented a scene where the user can see the saved artifacts. We use the RecyclerView library to create a scrollable list where the picture and type of each artifact is displayed (Griffiths 2017, p.537-578). The RecyclerView requires a number of classes and methods to be implemented in order for it to work, these are;

- `ViewHolder` that returns the layout elements used to display each artifact on the scrollablet list
- `Adapter` that holds all the data needed to display the list, in this case an `ArrayList` of Artifacts
- `getItemCount` that returns the number of artifacts to be displayed in the list
- `onBindViewHolder` which is called to create each of the individual objects shown in the scrollable list, using the data from the adapter and the layout elements returned by ViewHolder, this is described in more detail in the following(Griffiths 2017, p.537-578)

```
@Override
 public void onBindViewHolder(@NonNull RecyclerAdapter.ViewHolder holder, int position) {
    holder.textView.setText(artifactList.get(position).getTypeArtifact());
    String imageLink = artifactList.get(position).getImageReference();
    //imageview
    if (!imageLink.isEmpty()){
      Picasso.get().load(imageLink).into(holder.imageView);
    }
    holder.imageView.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            String typeArtifact = artifactList.get(position).getTypeArtifact();
            [...]
            Bundle toViewActivity= new Bundle();
            toViewActivity.putInt("id", id);
```

```
16                  toViewActivity.putInt("itemCount", artifactListCopy.
                        ↪ size());
17              [...]
18                  Intent intent = new Intent(v.getContext(),
                        ↪ ViewActivity.class);
19                  intent.putExtras(toViewActivity);
20                  v.getContext().startActivity(intent);
21              }
22          });
23          }
```

Listing 5.4: The implementation of RecyclerAdapter.ViewHolder

Part of our implementation of `onBindViewHolder` is seen in code snippet 5.4. On line 2 it is seen that the output from `ViewHolder` is input to `onBindViewHolder` with the variable name `holder`. On line 3 the text to be displayed in the textView is set, note that we have access to the artifactList as this is passed to the `RecyclerView.Adapter` and stored as a private variable in the `RecyclerAdapter` object. On line 4-8 the image is added to the imageView. Since it is only a link to the image, and not the image itself, that is stored in the database, we start by making sure that the imageLink is not empty as it would be if no image was stored with the artifact. If an image link is found the image is then downloaded from Firebase Storage using the Picasso library and added to the imageView. With the current implementation the images are downloaded every time the scrollable list is loaded. This is an issue as both performance and internet usage could be optimized e.g. by caching the images locally so each image is only downloaded once on each device.

In the last part of the `onBindViewHolder` method we add an OnClickListener to the imageView as seen on line 9, so that it is possible to click on the image to view and edit all details of the artifact. In line 18 a new `Intent` is created, an intent is used to switch from one activity to another in Android(Griffiths 2017, p.86-102), one of the input arguments is the activity we want to switch to, in this case the `ViewActivity` (see next section). In line 19 we add a bundle `toViewActivity` to the intent, a bundle is a way to pass data between activities using key-value pairs(Griffiths 2017, p.86-102), in this case we pass all the information on the artifact on to the `ViewActivity`, the bundle is being build in line 14 to 17 (not all information added to the bundle is shown), finally the intent is being activated in line 20, thereby switching the the `ViewActivity` displaying the artifact that the user clicked on.

5.4 Show and edit artifacts

As mentioned in last section the activity `ViewActivity` seen to the right in Figure 4.4 is used for displaying and editing a single artifact, listening to the audio recording associated with the artifact, and to select which artifact is displayed on the picture frame/tablets. Part of the Java code for the activity is shown in code snippet 5.5.

```
1  protected void onCreate(Bundle savedInstanceState) {
2  [...]
3     Bundle extras = getIntent().getExtras();
4     typeArtifact = extras.getString("type");
5  [...]
6     audioReference = extras.getString("audionRef");
7     EditText typeText = (EditText) findViewById(R.id.typeView);
8     typeText.setText(typeArtifact);
9  [...]
10    Switch switchPresent = (Switch ) findViewById(R.id.present3);
11    switchPresent.setChecked(present);
12    ImageButton playButton =  findViewById(R.id.playRecording);
13    playButton.setOnClickListener(new View.OnClickListener() {
14        @Override
15        public void onClick(View v) {
16            if(!audioReference.isEmpty()) {
17                playAudio();
18            } else
19            Toast.makeText(ViewActivity.this, "Denne genstand har
              ↪ ingen lydoptagelse!", Toast.LENGTH_SHORT).show();
20    }
21    });
22 }
```

Listing 5.5: The implementation of the OnCreate method for the ViewActivity class

The implementation is similar to that of the `createArtifact` activity, but now all the input fields are filled out with the data received in the bundle from the RecyclerView as described in last section. On line 3 to 8 it is seen how the bundle is retrieved from the intent and how text for the `typeText` field is retrieved from the bundle and assigned to the textfield. In line 10 and 11 it is seen that the checkbox to decide whether an artifact is displayed or not is set to the artifacts current value. The onClickEvent for the play audio button that plays the audio recording if

any existed. Otherwise it displays a message to the user that no recording is available is shown in line 13 to 20.

```
1  public void saveChanges(View view) {
2      EditText typeText = (EditText) findViewById(R.id.typeView);
3      String typeArtifact = typeText.getText().toString().trim();
4  [...]
5      Switch switchPresent = (Switch) findViewById(R.id.present3);
6      if(switchPresent.isChecked()){
7          for(int i=1; i<itemCount+1; i++){
8                  databaseCall.databaseconnection().child(Integer.
                       ↪ toString(i)).child("present").setValue(false);
9              }
10     }
11     Artifacts saveArtifact = new Artifacts(typeArtifact, yearArtifact
           ↪ , ownerArtifact, currentArtifact, textArtifact, imageLink,
           ↪ switchPresent.isChecked(), id);
12     databaseCall.databaseconnection().child(String.valueOf(id)).
           ↪ setValue(saveArtifact);
13     Toast.makeText(ViewActivity.this, "  ndringer   er gemt", Toast.
           ↪ LENGTH_LONG).show();
14 }
```

Listing 5.6: The implementation of the saveChanges method for the ViewActivity class

Finally the `saveChanges` method of the class is displayed in code snippet 5.6. It does 2 main things, the first is to retrieve all values from the input fields (line 2 to 4), whether changed or not, create a new Artifacts object with the values (line 11), and overwrite the artifact already saved in the database with these values (line 12). The other important thing that is happening in this method is that, if the present switch of the artifact is set to true, we loop over all artifacts in the database at set their `present` attribute to false. This happens in line 5 to 10. The values is then changed to true for the selected artifact when the complete object is saved to the database on line 12.

5.5 Present artifacts in the picture frame

The last code snippet to be highlighted is from the code running on the tablets that are used to present a picture of an artifact as seen in figure Figure 4.5, and in code snippet 5.7.

```
1  query.addValueEventListener(new ValueEventListener() {
2      @Override
3      public void onDataChange(@NonNull DataSnapshot datasnapshot){
4          for(DataSnapshot snapshot : datasnapshot.getChildren()){
5              Artifact artifact = new Artifact();
6              artifact.setPresent(snapshot.child("present").getValue(
                   ↪ Boolean.class));
7              if(artifact.getPresent() != null && artifact.getPresent()
                   ↪  == true){
8                  image = (ImageView) findViewById(R.id.imageView3);
9                  Picasso.get().load(snapshot.child("imageReference").
                       ↪ getValue().toString()).into(image);
10             }
11         }
12     }
13 [...]
14 }
```

Listing 5.7: Method - present()

This code has 2 main purposes, to keep track of which artifact is selected for presentation and to display the image of this artifact. For this we use the `ValueEventListener` class from the Firebase library (*valueeventlistener | firebase_2022,*). This class is designed to discover every time a change is made to the Realtime Database, every time this happens the `onDataChange` method is called, so by overriding this method we can control what happens every time a change is detected in the database. The input to the `onDataChange` method is a `DataSnapshot` that contains a snapshot of the database after the change. As shown in line 4 to 10 we loop over all artifacts in the database checking whether their `present` attribute is true, if it is, we retrieve the image reference for this artifact and download and display the image in the same way as described earlier.

5.6 Usability Evaluation

As we manage to create a stable version of Familiearkivet, we decided to examine user interactions and explore potential problems before introducing it to users. To achieve this we conducted a usability evaluation where we asked two peers to interact with the system. It is important to stress, that the two peers had knowledge of the usability principles, but where not experts on the subject. In addition we only asked two peers, knowing the evaluation would not be very representative. Though the evaluation was not conducted to a full extends, we still believed the two peers would be able to pick up common errors and identify design flaws that could interfere in a later evaluation with potential users (Benyon 2013, p.217). To achieve a quick and effective review we compared the peers comments against the three overall usability principles of:

- Learnability: Access and ease of learning and remembering the system (Benyon 2013, p.86)
- Effectiveness: Ease of use (Benyon 2013, p.86).
- Accomidation: Accommodating and respect differences between people(Benyon 2013, p.86)

The usability review was conducted by letting the peers have a walk through of the system. We provided them with limited knowledge of the system and did not give them any representative task to conduct as we wanted an overall evaluation of how intuitive Familiearkivet was. In order to find problems we asked our peers to think-aloud to understand the interactions process they underwent. During the evaluation we only provided small indications on the systems functionality. The peers reported the following:

- When creating and editing an artifact the user is unable to see all the information related to the artifact
- When creating an artifact the user lacks indications that the artifact has been registered.
- When viewing all the artifact the user is unaware that it is scroll-able
- When viewing all artifacts the user lacks and overview
- When editing an artifact the fields are left blank, this makes the user forget what type of information is needed in the field.
- When editing an artifact the user is directed nowhere afterwards
- When editing an artifact the user is unaware that editing is possible

As the reported issues was manageable, we had a discussion on how to accommodate the found issues as we believed it would enhance the user experience. The solution to the problems was then implemented in Familiearkivet, as an example we implemented toasts to provide the user with feedback in relation to their interactions as seen in code snippet 5.3. We believed the changes made would benefit Familiearkivet and create a version that was ready to be tested.

Chapter 6

Evaluation

In this chapter we evaluate Familiearkivet. Evaluation can be done in various ways, therefore this chapter serves to present the test techniques we have used to gather data in order to evaluate Familiearkivet. A test is a way to get an impression of what the system should do in accordance to its purpose. Therefore this chapter will collect test data in order to evaluate if Familiearkivet works as intended.

6.1 Pilot test

After having prepared a version of Familiearkivet, we had some concerns about whether or not the system was stable enough to test and if it would be able to provide us with answers with regards to our problem area in a longer field deployment. Therefore, we conducted a pilot test to explore how the system behaved when used in a real context.

For the pilot test we released Familiearkivet to a family of two households with two parents and their son as seen in table 6.1. The names we use are fictional as the participants are anonymous.

Gender	Alias	Age	Rolle in family
Female	Lisa	60	Mother
Male	Harry	64	Father
Male	Kim	29	Son

Table 6.1: Demographic of the pilot test

We arranged that the test should last for three days. As we prepared the pilot test we found multiple bugs and usability problems that would affect a longer test to an extend where the test data would be compromised.

We therefore changed our test strategy, and instead we gathered the participants in the parents' home. One of the group members were present in order to circumvent the bugs during the test which lasted for about two hours. The group member helped the test persons download the system. She noted what the participants did and said in relation to their experience with the system and what errors that occurred. In addition to this we also conducted an interview with one of the test persons to further understand the experience with Familiearkivet and to test our interview guide for the field deployment(see Appendix C).

Despite the change of test strategy we found that Familiearkivet created a space where the test persons talked about family history and reminiscence. Especially the father started telling stories about his childhood, because he registered an old toy car which he had played with as a child. The car had been his father's who got it on a trip to Paris. The toy car generated more stories, which the son later, in the interview, told us that he had never heard before, which indicates that the system despite its flaws supported storytelling surrounding an object. The participants did not use the audio recorder to record these stories, but when we interviewed the son he told us that he would use the text fields as cues for remembering the stories he heard that day.

We also found a total of six bugs. For example, when the users selected for presentation in the picture frame, the system would enable two artifacts thereby displaying two artifacts instead of one as intended and that pictures needed to be taken horizontally. We fixed a total of three bugs and argued that the improvements we made were enough to deploy the system, and that the remaining errors would not compromise the experience of using the system in everyday life. We therefore assessed that we would be able to get answers to our research questions.

6.2 Field Deployment

The goal of the field deployment was to implement Familiearkivet to be used in its intended context in order to collect data to answer our research questions. We found a family which we assessed to be suitable users of Familiearkivet, because they posses a lot of heirlooms and has an interest in the family history and heirlooms. Four persons from the family, from four different households, agreed to test the system, see table 6.2. The names we use are fictional as the participants are anonymous. We assess that Lily and Britney are caretakers of multiple objects which means that they should be able to use the system as intended for caretakers. Furthermore their mother is still alive, and they want to inherit the family heirlooms that she is currently the caretaker of, therefore we also get the perspective of the successor from these two participants. Andy and Sofie are much younger and does not seem to possess a lot of inalienable objects which means that their participation contributes to a better understanding of the receiver role.

Gender	Alias	Age	Rolle in family
Female	Britney	63	Mother to Andy, sister to Lily
Female	Lily	64	Mother to Sofie, sister to Britney
Male	Andy	29	Son of Britney
Female	Sofie	33	Daughter of Lily

Table 6.2: Demographic Field Deployment

To begin the field deployment we arranged individual meetings with our four participants in their homes. During the meetings we helped them download Familiearkivet to their smart phones. Afterwards we let them read the introduction in the app and explore the system. To be sure that the app worked as it should on their phone we asked them to register an object. While they were selecting the object to register, we informed them that the other family members would be able to see the object in their app, and that we would look at the registered objects as well. During the registration of the selected object we explained the bugs in the app, that we did not manage to solve, in order for them to be able to avoid these bugs. In general all test registrations went well and it seemed like they found it easy to use the app. When the registration was done we showed them the picture frame and explained how to present objects on it using the app. We told the participants that the other family members would see the same picture and that they all could change the picture displayed in all the picture frames.

Lastly we told them to use the system as they found suitable during the week of deployment, they could not do anything wrong, and if they experienced any problems with the use of the system they should not hesitate to contact us. None of the participants contacted us during the week of the deployment. Before ending the meeting we scheduled a debriefing interview a week later where we could interview the participants about their experience with Familiearkivet.

We decided to take a qualitative approach to get a deeper understanding of the family's experience with Familiearkivet and we therefore conducted individual interviews with all participants in the field deployment. We assessed that interviews would be most suitable because we knew from previous experience (see 2.3) that there was a possibility that we would touch upon sensitive information. We decided to conduct a semi structured interview like the ones in section 2.3) and develop a new interview guide(see Appendix C).

To analyse the data from the interviews we formulated some new research questions to structure our findings. Our research questions is as follows:

- How was Familiearkivet used?
- How did the caretakers select the objects to register, and how were they experienced by

the receivers?

- How do objects become inalienable through Familiearkivet?

6.3 Findings

In this section we present the findings from the field deployment and the interviews we conducted afterwards. The section will be structured based on the previous described research questions.

6.3.1 How was Familiearkivet used?

The four participants registered a total of 40 objects, table 6.3 presents the types of objects the family registered.

Object categories	Amount
Heirlooms	12
Presents from relatives	11
Other	8
No information	9

Table 6.3: Categories of registered objects in Familiearkivet

Overall we noted that all participants had used the app to register objects actively during the one week of deployment. The participants told us that they found it easy to use Familiearkivet. The objects were generally registered with information about type, year, first owner and current owner. Many also had a small text explaining e.g. the story of origin. Non of the objects had a audio recording attached to it.

During the interviews the caretakers were positive with regard to the amount and type of information to fill out. A caretaker mentioned that it was nice to have the text field to write other details in:"*It is nice to have this field for free text to specify things [...] like how you got it and stuff like that. I think that this is really nice.*" Generally they used this text field for small texts, and most of them expressed a desire to write down stories about the objects. Based on what they wrote in the text fields, we found examples of both stories of origin, where an example is a dresser registered with the text *Grandmother's and grandfather's wedding gift*, and text describing the current use e.g. *It is currently used to display my collection of rocks*.

An example of an object where the text represented reminiscence is a horse figurine, see figure **??**: *I got Musse [a horse figurine] when my grandmother passed away. I remember it was always on display on their bookcase in the living room.* These examples shows that the text fields were used to present different kinds of information.

During the interviews we also found an example of a caretaker who had registered an object in Familiearkivet, see figure 6.1.

When one of the other participants saw the object and discovered that there were missing information about the object she added the information. This example shows that the system could also support the caretakers in getting more information about the object they are caring for from the other family members, which was the intent with letting all users being able to edit all information in Familiearkivet.

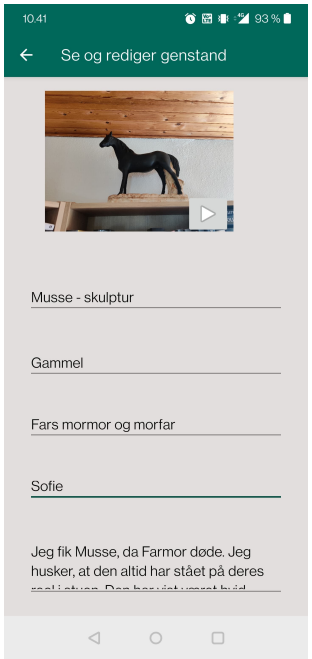

Figure 6.1: An example of a registered object in the app

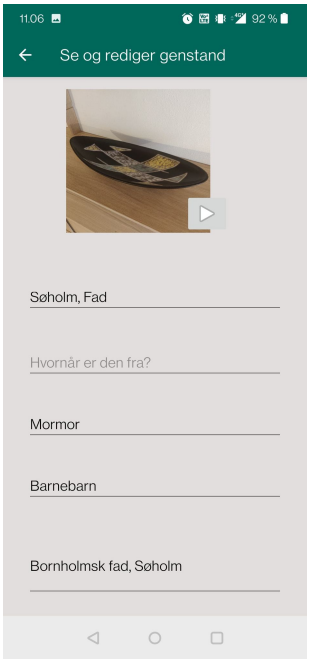

Figure 6.2: An example of a registered object in the app

In relation to the missing audio recordings we asked the participants about their thoughts in regards to the audio recording option. The participants all told us that they did not want to use it to record themselves, as one of the participants put it *"I don't like listening to my own voice. Maybe I'll use it to record conversations [with her mother], as it may occur more natural to my mom"*. This quote represents a common issue that we found during the interviews: The caretakers do not want to record stories but the receivers would like to have access to audio recordings with the stories. Furthermore, we find it questionable if the grandmother would be willing to be recorded, considering that all four participants did not want to be recorded themselves. Perhaps it could make a difference if it was a conversation that was recorded, but based on our data we do not know, and it would require further research to determine.

The participants told us that they believed that they would have talked about some of the registered objects if they had met each other during the deployment period, asking more about them, clarify some things etc. We do not know if it actually would be the case, but during the pilot test (see section 6.1 where the family were gathered around registering objects, we found that the caretaker told stories about the objects. The conversations were however not recorded, as it did not seem like they thought of using the audio recorder in that way. In the pilot test, Familiearkivet seemed to support storytelling to a further extend than during the field deployment. There may be different reasons for that: One could be that the family was gathered when registering objects during the pilot test, in contrary to the field deployment where they registered objects separately. Another reason could be that the family did not meet during the field deployment and the result could have been different if they had met.

Regarding the use of the picture frame during the deployment period, we kept track of changes of the display by using a phone which showed the content of the picture frame. We noted that they changed picture two to five times a day during the week. Based on this observation we argue that they used the picture frame regularly during the deployment period. In general the test participants told us during the interviews that they had payed attention to the picture frame and that they had placed it in central places of their homes like in the living room and kitchen as seen in figure 6.3 and 6.4.

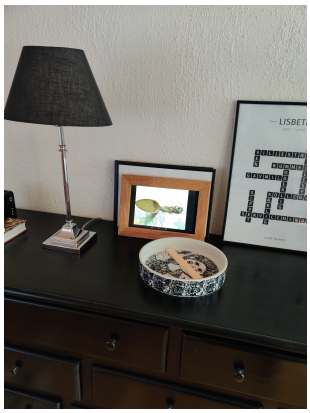

Figure 6.3: In Lily's home the picture frame was placed in the living room on a chest of drawers

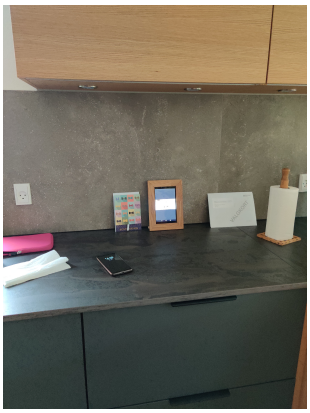

Figure 6.4: In Britney's home the picture frame was placed on the kitchen counter in the open-plan kitchen and living-room

All participants had presented pictures in the frame, but there were divergent experiences with this. A receiver told us that he found it intimidating to decide for the whole family what the picture frame should display, and he told us that he would like that it displayed multiple

pictures in rotation. In this case he believed it would be less importunately to select an object to display among the other objects. On the other hand a caretaker told us that she would not like it if the pictures in the frame rotated because it would create disturbance in the living room like a television may have a tendency to do. She did not find it intimidating to change the picture and it may be worth noting that this caretaker thought that she was the one who had changed the picture the most.

We believe that this difference in experience could be related to the motivation for presenting, as the caretaker liked to show her objects which she may believe is important for the family while the receiver could doubt that his objects were interesting for the family to look at.

Another receiver believed that if an object is "important enough" to get registered in the app, it should also be presented in the picture frame. In general she was enthusiastic about the picture frame and it seemed to have encouraged her to go into the app and read the information about the presented object. During the meetings with this receiver we learned that she was very interested in the history of the family and it seemed like she could have great potential as a future caretaker, which could be the reason for her strong interest in Familiearkivet.

In general we learned that the picture frame supported the display of objects during the field deployment but we lack knowledge in terms of whether it was because of the charm of novelty or if it will continue to be interpreted and used in this way.

6.3.2 How did the caretakers select the objects to register and how were they experienced by the receivers?

To answer this research question we will first describe how the caretakers had selected which objects to register and afterwards how the receivers experienced them.

One of the caretakers told us that she had second thoughts about the objects she had registered, and if she could she would start over:" *[...] then I would start with the old objects. [...] the family objects [...] like the 'fish spade' [silver serving cutlery] and the old ring and the perfume bottle.*" Likewise, another caretaker explained her considerations as:"*It is something that could have value for descendants, because, where is it from? Who have owned it, and stuff like that.*" These statements suggest that as caretakers they want to register inalienable objects which they see as important for the family, and therefore also want to pass on to the next generations.

One of the receivers were very committed about the Familiearkivet app and used it actively as a receiver. She told us that she had been aware of what the other three family members had registered and that she was very interested, she told us:" *[...] I have also read about them all already. I was interested in knowing where they've got them from.*" She further told us that she could see the picture frame when she watched television, and she noticed when anyone presented

another object, and if it was a new one, she would open the app and check it out. She had also been encouraging one of the caretakers to register some more objects, while also questioned some of the registered objects as e.g. a dog that were registered which she did not think belonged in Familiearkivet. She also used the system as a caretaker as she registered several objects, where some of them were heirlooms, and some were gifts from special occasions, but this also made her realise that:" *All of a sudden, I realised that I don't have that many heirlooms. I am quite dissatisfied about that. [...] I would like to get some more [heirlooms], but I guess that'll come in time,*" suggesting that she is likely to become a caretaker in the future for family objects, as she is already interested in being one and engaged in knowing the stories about them.

The other receiver also registered objects into Familiearkivet, but his considerations differed as he shared his thoughts about registering a hat:" *I had to choose something and I thought, well this was good enough.* He was not as engaged in the app but he did read or look at some of the objects which had been registered. He also said that he did not think that he would use the system, but interpreted it more like a system for older adults.

It seems like both the receivers had another purpose of registering, which were for themselves to remember and not as much for sharing. They might miss a clear purpose for registering, meaning that the objects they registered may not be inalienable. This also aligns with our intentions towards caretakers being the ones to register and not receivers, but one seems to have been intrigued by Familiearkivet and saw it as beneficial both as a caretaker and receiver, while the other might have felt an obligation to register as being participant in this deployment.

One of the caretakers also expressed a desire to have the receiver role in regards to Familiearkivet as she expressed that she would like to have a place to look information up regarding her mother's objects:"*I have heard them [the stories] many times, but I can't remember them. And it annoys me, because I actually want to know [the stories]. [...] I think it would have great value if we can get my mother to put a lot of what she has [stories and objects] in here [the Family Archive] [...] The security in knowing that it is preserved.* Besides registering objects, she also see the opportunity to manage all the information which she, as a receiver, has a difficult time managing and remembering.

6.3.3 How do objects become inalienable through Familiearkivet?

As described we argue that storytelling, use and display are means for receivers to create a relation to an object which thereby may be inalienable. In the following we will therefore present how different parts of Familiearkivet seemed to support the caretaker in convincing receivers of the importance of the objects.

When we asked the participants if they had learned something new about some of the registered objects, all four participants answered positively on this question. One receiver e.g. answered: "*I had seen the objects before but I did not know the history about them. So I have learned something new. I learned the name of my grandmother and stuff like that.*" Another receiver knew most of the objects beforehand, but she did not know a washstand set which a caretaker had registered and displayed on the picture frame. The receiver had however not looked it up in the app to learn more about it, but she told us that she had thought about asking the caretaker about it the next time she saw her.

A caretaker registered a silver serving cutlery for serving fish which she had inherited from a now deceased family member. A receiver confirmed that she recognised the serving cutlery, and that prior to reading about it she had only known that it is an heirloom. The receiver told us that after learning who it had belonged to through the registration in Familiearkivet, it meant more to her because the first owner was a closer relative than she thought.

Based on these answers we learned that Familiearkivet during the deployment period supported information sharing about objects, which we asses as a good sign in terms of supporting the caretaker in convincing the receivers about the importance of the registered objects.

To gain insight into whether Familiearkivet had convinced the receivers of the importance of inheriting the registered objects we asked them if they would be more inclined to inherit the objects now. One receiver answered:" *[...] They [registered objects] have been selected among other objects that the family member owns. [...] I believe that the registered objects will have more meaning [than other objects] because you have spent time selecting it and registering it. [...] Some objects will be kept by interest because of the registration, and others might be kept because of a form of guilt or duty to honour their memory.*" Thus, the receiver suggest that he might be convinced to inherit and keep the objects registered by other family members, either by interest or by duty. Another receiver similarly said:"*There are some objects I would be more likely to inherit now [after being registered]*", but when asked if she would feel more obligated to inherit she answered:"*Hm, not more than I already do.*"

One of the receivers told us that she liked that she could be able to see which objects her mother found important for the family to inherit. But if she were to find out that some of the registered objects that she inherited did not mean as much to her as she had anticipated, she

would get rid of it, and in these cases she would also delete the objects from Familiearkivet. This indicates that she in the first place could have a tendency to inherit the objects based on the registration in the system, but if the object and its story did not engage her, she could decide to get rid of it. It therefore seems like the receivers would use the system when they were to select the objects to inherit, and in that way the caretakers could be given a chance to have a greater influence on which object but the inalienability of the objects is not secured yet because they could be disposed at a later stage.

Our findings suggest that the caretakers wanted to register their important objects because they wanted the receivers to know the information and stories about them. The older caretakers had experienced how it is to not remember a story told by a deceased family member, and to not have that person to ask about it anymore. In relation to this they found Familiearkivet to be a useful tool, because they wanted to preserve the information and stories, for the next generations to not have the same problematic experience. Based on the field deployment it seems like Familiearkivet may provide a better overview and sorting possibilities for the receivers because they have an informed foundation to make decisions from, but it is difficult to conclude if this would be the case in the long term.

Chapter 7

Discussion

Like other researchers, we have investigated archival practices for people's important objects within the context of the family (Gloyn et al. 2018). We have limited our focus to a category of physical objects which are important for a family rather than just an individual. We have drawn on Weiner's studies and identified the presence of inalienable objects in danish families.

Inalienable objects are a type of objects that are kept in the family, and thereby has a certain value within the family, by bringing the past into the present (Weiner 1985). In addition to inalienable objects we have found the role of the caretaker as having certain responsibilities regarding taking care of those objects, similar to the research of Curasi, Price, and Arnould, but we further argue that inalienability is not only affected by a caretaker, but is dependent on it (Curasi, Price, and Arnould 2004).

Our data suggest that it is only heirlooms which can be inalienable. Like other researchers have pointed out, the difference between a caretaker and an owner of an object is the experience of it. A caretaker do not feel like the owner of an object, as they do not feel like they have the rights to do with the object as they please (Curasi, Price, and Arnould 2004). Similar to other research, we have identified certain responsibilities of the caretaker regarding passing on objects along with their stories and rituals in order to keep the inalienable objects in the family (Curasi, Price, and Arnould 2004).

Similar to the study of family archival practices (Kirk et al. 2010), we have also developed a system to be used in the daily life. We have identified caretakers as the primary users and curators of Familiearkivet. Kirk et al. found that there were different motivations to use their system which gave reason to consider both playful interaction and managing archival practices (Kirk et al. 2010). As we focused on supporting caretakers, who are already interested in curating their objects and fulfilling their responsibilities, we believe they are motivated for using a system for archival purposes. Therefore, in agreement with Kirk et al. we believed it would be most beneficial for Familiearkivet to conform to archival practices for this scope (Kirk et al. 2010). A further development of Familiearkivet could be the addtion of some kind of playful interaction to further motivate the use of the system.

As a communication tool for caretakers to draw attention to their inalienable objects we developed the picture frame. It had two main purposes: 1) to display objects which are otherwise difficult to display or use. 2) To intrigue the receivers to look up information in the

app or ask the caretaker for more information about the displayed object.

It is evident in our data that use of the picture frame did draw attention to some objects which other participants did not know of. However, we believe that our data regarding the picture frame is limited, as many of the registered objects during the field deployment were objects which already were displayed in the homes. There might be several reasons for that, where one reason might be that we did not restrict or advise on which objects the participants should register. Another reason might be that people are often displaying their most important objects in their home, resulting in those being the first objects they think of registering. Furthermore, we believe the time frame to be a possible reason for the participants to not getting into the drawers and closets for the hidden objects, as they may not have had natural opportunities to do so in the deployment period. Thus, they might just have picked the objects they saw in their everyday lives.

Like earlier researchers we found that people have a desire to share memories with others (Li et al. 2019; Frohlich and Murphy 2000). Furthermore, we found that the caretaker doubted if the receivers could remember or even listens to the stories they tell them about the objects. The receivers told us that they could not remember the stories as they tend to get long and sometimes the receivers could not relate to the stories e.g. they do not know the people in the stories, which makes it even harder for them to remember the stories. The older receivers told us that they had experienced to forget a story that they knew they had been told, and would therefore like to save the stories for the future when they no longer have the caretaker to ask.

To prevent the loss of these stories we implemented an audio recorder and player for the caretakers to easily preserve the stories about the objects. Furthermore, we wanted to accommodate the tension between listeners and tellers by creating a timing for storytelling, described in earlier research (Jones and M. Ackerman 2018; Jones and M. S. Ackerman 2021). We believed that by making it up to the caretakers and receivers when to tell and listen to the stories, it could prevent this from ever happening because both parties are waiting for the ideal moment. From our field deployment we found that the receivers wanted the recording but in contrast to earlier research (Li et al. 2019; Frohlich and Murphy 2000) we found that the caretakers did not want to record themselves. We must therefore conclude that Familiearkivet as it is today does not manage to preserve stories for the receivers to as far as an extend as would have been the case if the users were willing to record their stories. In future development of Familiearkivet it should be considered how the system could motivate the use of this feature, or how other features facilitating the storytelling and conservation of the stories could be implemented.

Lastly, it seems like the users who found Familiearkivet the most useful were the ones who were both caretakers and receivers. Because they could use it for registration of their own inalienable objects while also liking the idea of the system's ability to store information about

objects that they should one day inherit.

7.1 Limitations

In this project we became aware of several limitations which affected the results of our findings. In this section we summarize these limitations to describe how it affected our findings and what future researchers should to be aware of. We decided to focus on supporting the caretakers in the process of convincing others by using the means of display and storytelling to convince others. As we found the inalienable process as something that happens over time, we need to address that this project had limitations in accordance to the time frame, which affected the findings in several ways.

We have developed Familiearkivet to be used through several generations as taking care of inalienable objects depends on keeping the objects in the family. Therefore, in order to establish if Familiearkivet has succeeded with supporting caretakers, we need to explore a situation where there is opportunity to transfer inalienable objects (see figure 3.1). This means that the use of Familiearkivet should be investigated over a longer period of time. Furthermore, the time frame has limited our ability to gather data with regard to use the of the picture frame, because the experience and use of the frame may change and develop if Familiearkivet is used through a longer period of time where objects are not being registered as often.

Another limitation in this project may be the participants in our interviews, where we focused on targeting a group of potential caretakers. Here we could have included a broader demographic to get a broader perspectives, especially a younger group could have provided more insights on the receiver role. In addition to this we acknowledge that we have limitations within our findings as Familiearkivet was only fully deployed within one family. We believe that more data should be acquired in order to get a better representation of the use of the system.

7.2 Future work

This project addresses how to support caretakers in taking care of inalienable objects. We therefore propose that future research takes the following considerations into account in order to accommodate the challenges further.

We propose future researchers to consider the implementation of user restrictions. Based on the field deployment we believe that it could be beneficial to have a feature where all users have their own user account in order to track their activities and to give the users the ability to control what they share with who. This could enable users to comment on each others objects by e.g. adding their own memory of it, or adding a picture. In this way it would provide more sharing while also keeping track of who added what. It would also be useful in order for all users to understand the information, as they would know who "grandmother" is as it

would be in relation to the user who wrote it. Furthermore, it would make it easy to track and add a timeline of ownership, as this could be tracked through generations. In addition to this, it could be considered to connect the system to a family tree in order to connect objects to family members and for future generations to be aware and have access to information about ancestors.

We also acknowledge that we did not provide functionality so the users could delete objects, but we estimate that with a lot of objects in the system, it can become unmanageable not to be able to do that. Furthermore, our results showed that caretakers and future caretakers may find Familiearkivet useful when deciding which objects to keep and which to dispose. Therefore, it should also be possible to delete it from the archive. Although it might be interesting to examine if there is an interest in keeping "lost" objects in Familiearkivet, but in a separate category.

Furthermore we also recommend that future researchers explore how sound may be incorporated in a system. We found that sound would be a benefit for receivers to save stories, but found it difficult to implement it as caretakers did not like recording themselves. We therefor propose future researchers to explore functionality that engage users in using the sound function. We talked about forcing the users to use sound or making them aware of the sound opportunity. This could be done by notifying users whenever there are multiple members together indicating that they should record a story. Another option could be to make it possible to store several shorter sound bites instead of only one, to remove the pressure to say everything on the caretakers mind in a single take.

We also propose future researchers to include possibility of adding more than one picture to each object. This functionality should be added in order to provide more sharing of memories and use through generations. As Familiearkivet is developed to be used through generations, pictures from different periods could add meaning and value to an object and contribute to tell the story of the object.

It could also be investigated if sound or another type of notification could make people aware of the frame in a longer period of time. Another approach could be to add the possibility to automate the presentation of objects, so that the users should not necessarily keep deciding what to present if they should lose interest in using the presentation switch.

Chapter 8

Conclusion

In this study we seek to develop a system that supports caretakers in taking care of inalienable objects. We chose to focus on supporting storytelling and display because we found that these are means that caretakers use to convince others of the importance of the objects. Furthermore, we found that receivers had difficulties in remembering the stories about the inalienable objects. Often they just knew intuitively that the objects were important family heirlooms which they should inherit. To support these issues we developed Familiearkivet which is a system that contains two elements:

1) A mobile application where objects are registered by the caretaker. The app also allows receivers to read about the chosen objects. This part of the system was inspired by archival practices. The aim of the app was to prevent loss of the information and stories about the objects, which we found were essential for keeping the objects within the family.

2) The digital picture frame which households who uses Familiearkivet has in their homes. The aim of the picture frame was twofold as it firstly, allowed caretakers to display objects which are otherwise difficult to display or use. Second it could intrigue the receivers to look up information in the app or ask the caretaker for more information about the displayed object.

To determine if Familiearkivet supports caretakers in taking care of inalienable objects we deployed the system for a week in a family with four households. The result indicated that the system lives up to the purpose, at least the short term. The caretakers in the family wanted to register their own objects in order to pass on the inalienable objects to the next generations and preserve the stories about them. However they did not use the recording functionality which was developed to support storytelling, we must therefore conclude that Familiearkivet currently does not support the preservation of oral stories related to the registered objects. Furthermore, we found that the receivers wanted the caretakers to use the system and register their inalienable objects because they assessed that it would make it easier for them to select objects to inherit when they pass away. In addition, by presenting objects on the picture frame, receivers became more aware of and learned new information about the registered objects.

We conclude that we have managed to develop a system which, based on our results, supports caretakers in taking care of inalienable objects by incorporating archival practices and facilitating display of and transmission of information about inalienable objects. Furthermore, we have concluded that the next step in strengthening the care for inalienable objects would be to develop a tool that makes it easy to preserve the storytelling linked to the objects.

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Chapter A

Appendix A

Interviewguide:

Vi er i gang med et projekt, hvor vi undersøger personers forhold til deres ejendele, og om en ejendels historie har indflydelse på ens forhold til den. Vi har sagt det tager omkring en time, men det kan være svært at vurdere, fordi det handler lidt om hvor mange ejendele vi skal rundt om og historierne bag. Vi prøver at holde tiden så godt vi kan, så det kan være at vi ikke når lige meget i dybden med alle ejendelene du har taget med. Men det tager vi hen ad vejen. Det vil være mig der interviewer dig, men det kan være xx og xx byder ind med spørgsmål også. Jeg vil først stille dig nogle spørgsmål som handler om din baggrund, og bagefter vil jeg høre lidt om de ejendele som du har tænkt på.

Dine svar vil være anonyme og vi vil gerne optage det, hvis det er okay med dig?

- Hvor gammel er du?
- Hvor bor du henne?
- Hvilken boligtype bor du i?
- Bor du sammen med nogen?
- Er du pensioneret?
- Hvad er var dit arbejde?
- Har du børn og børnebørn, eller har den rolle for nogen?

Vi bad dig om at tænke over og måske tage nogle billeder af 5-10 ejendele, som betyder mest for dig, dem kunne vi godt tænke os at snakke lidt om nu.
(Måske tage en ting ad gange // måske tage det lidt mere flydende)

- Hvad er det?
- Hvorfor betyder den meget for dig?
- Hvor er den placeret til daglig i dit hjem?
- Hvad bruger du den til og hvor tit bruger du den?

- Hvad minder den dig om?
- Hvor tit er du opmærksom på den og tænker over dens betydning?
- Tror du at den har stor betydning for andre i din familie?
- Forestiller du dig at det er en genstand som nogen ville have et ønske om at overtage?
- Hvordan tror du at den vil blive brugt hvis du giver den videre?

Kan du ud fra de genstande vi har talt om, vælge 1 eller måske 3 ejendele der er de vigtigste for dig?
Hvad er det der gør at det lige præcis er de ting du vælger?
Hvordan var processen at udvælge dine genstande ?

Chapter B

Appendix B

Interview guide - 2. runde: spørgsmål til caretaker:
Tak fordi vi måtte komme igen. Vi vil i denne omgang spørge lidt mere ind til de genstande du havde med sidst. Bagefter vil vi interviewe dine døtre. Er det okay vi optager?

- Tror du der er nogen der vil arve dem?
- Hvorfor er genstanden der hvor den er?
  - Passe på?
  - Ansvar
  - Byrde
- Vil det gøre en forskel, hvis du ved at der er en der vil arve den efter dig?

Spørgsmål til Datter

- Kender I de her genstande?
- Kan I fortælle om dem?
- Betyder de noget for jer?
- Tror I at I kunne finde på at arve dem?

Opgave: vælg genstande i dette rum som du kunne være interesseret i at arve/give videre.

Appendix C

Interviewguide - Debriefing:
Vi vil gerne stille dig nogle spørgsmål Vi regner med at det vil tage imellem halv og en hel time.

Må vi optage?

Vi vil først spørge ind til hvordan det var at bruge systemet sådan mere funktionelt, og bagefter vil vi spørge ind til oplevelsen med systemet.

Hvordan har det været at teste systemet?

- Hvordan var brugen af appen?
- Hvordan har oplevelsen med billedrammen været?

Hvordan gik registrering af genstande?

- Fungerede registreringen som du regnede med?
- Opstod der fejl? (Hvilke?)

Har du redigeret nogle af de genstande der er registreret?

- Fungerede det som du regnede med?
- Opstod der fejl? (Hvilke?)

Hvordan gik præsentation af genstande?

- Fungerede præsentationen som du regnede med?
- Opstod der fejl? (Hvor og hvilke?)

Var der noget du synes virkede særligt godt i systemet? Var der noget du synes virkede knap så godt i systemet?

Nu går vi over til de mere overordnede spørgsmål om oplevelsen med at teste.
Har du registreret nogle genstande?

- Hvis ja – kan du give eksempler på nogle genstande du har registreret?
- Hvorfor valgte du at registrere lige de genstande?
- (Hvad var dine tanker når du valgte genstande?)
- Synes du at det var passende med den mængde og type information du havde mulighed for at udfylde i appen?
- Hvis ikke, hvad kunne du så have ønsket at tilføje/fjerne?
- Har du tilføjet lydoptagelser til nogle af de genstande du har registreret?
  - Hvis ikke, hvorfor?
  - Hvis ja, hvilken slags optagelse?
- Har du lagt mærke til om der er andre der har registreret genstande?
- Har du været inde og kigge på disse genstande?
- Har du fået kendskab til nye genstande, som du ikke kendte til før?
- Har du lært noget nyt om nogle af de registrerede genstande? Eksempler?
- Har du præsenteret nogle genstande på billedrammen?
- Hvad var dine tanker omkring at præsentere genstande?
- Hvor har du haft billedrammen til at stå?
- Har den stået der hele tiden, eller har du flyttet den?
- Har du lagt mærke til den?
- Har du opdaget når der er skiftet billede?
- Har du snakket med familiemedlemmer om nogle registrerede genstande?
- I hvilke situationer har I snakket om dem?
- Hvad handlede snakken så om?
- Er du blevet spurgt ind til nogle af de ting du har registreret?
- Har betydningen af nogle af genstandene ændret sig for dig?
- Efter at have brugt Familiearkivet, har du så været mere opmærksom på nogle genstande?
- Kunne det give mening for dig at bruge et system som Familiearkivet?

- Hvad kunne du forestille dig at din motivation for at registrere genstande i systemet være?
- Hvad kunne du forestille dig at din families motivation for at registrere og præsentere genstande kan være?
- Kunne du forestille dig at du ville bruge systemet anderledes om 20 år?
- Kunne du forstille dig at bruge systemet til andet?