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Relations we have to digital artefacts

Masteroppgave i MLREAL

Veileder: Dag Svanæs

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Abstract

With material possessions playing an important part of western societies, what we have is closely linked to who we are. Among these things there are special items that are more important to us than others. In this study, these relations are examined to build an understanding of how our relations to digital artefacts differ from our relations to physical artefacts. This was done by interviewing 16 participants about their artefacts, eight over 30 years old and eight under 30 years old. They were asked about their most cherished artefacts, how they maintain them, and what they think of the digital compared to the physical. The data was analyzed as a collective dataset, but also separated by age group. The age groups were then compared to identify similarities and differences. It was found that there were several differences between the types of physical and digital artefacts we cherish and how we maintain them. Physical artefacts are often maintained proactively and reactively, while digital artefacts are often only maintained proactively. Findings also suggests that material properties and uniqueness are the two major challenges digital artefacts must overcome to be generally considered as valuable as physical artefacts. It was also found that age might affect the view on the digital and the physical and the types of digital artefacts we cherish, where the functionality of digital artefacts become more important with age.

Sammendrag

Materielle eiendeler har alltid vært viktige i vestlige samfunn, og hva vi har er nært knyttet til hvem vi er. Blant disse eiendelene eksisterer det spesielle ting som er viktigere for oss enn de andre tingene. I denne studien blir relasjonene til disse spesielle tingene undersøkt, slik at vi kan bygge opp en forståelse for hvordan våre relasjoner til digitale artefakter skiller seg fra relasjonene til våre fysiske artefakter. Studien ble gjennomført med 16 deltakere, der åtte av dem var under 30 år gammel og åtte var over 30 år gammel. De ble intervjuet om deres mest verdifulle artefakter, hvordan de vedlikeholder dem og hva de tenker om det fysiske sammenlignet med det digitale. Dataen fra intervjuene ble først analysert samlet, for så å bli delt opp etter aldersgruppe. På denne måten kunne vi se hva deltakerne generelt tenker om temaet, samt sammenligne de to aldersgruppene. I studien ble det funnet at det var flere forskjeller mellom fysiske og digitale artefakter når det kommer til hvilke typer artefakter vi verdsetter og hvordan vi vedlikeholder dem. Fysiske artefakter ble ofte vedlikeholdt både proaktivt og reaktivt, mens digitale artefakter ofte bare ble vedlikeholdt proaktivt. Funnene foreslår også at de materielle egenskapene og de unike egenskapene til fysiske artefakter er de to største forskjellene digitale artefakter må overkomme for å kunne bli anerkjent som like verdifulle som fysiske artefakter. Det ble også funnet at alder trolig påvirker synet vårt på det fysiske og det digitale og typen digitale artefakter vi verdsetter. Funksjonaliteten til de digitale artefaktene ble ansett som viktigere for de eldre deltakerne.

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1 Introduction

1.1 Introduction and motivation

With material possessions playing an important part of western societies, what we have is closely linked to who we are. Among these things there are special items that are more important to us than others (R. W. Belk, 1988). Examples of these items are your first teddy bear or a souvenir you bought while on vacation many years ago which you display on a shelf at home. The physical artefacts are things you can display and touch, but this is not as much the case with digital items. Statistics show that our society is getting digitalized as shown by the falling sales of CDs and the increase in online streaming ('U.S. Recorded Music Revenues by Format', 2020). I wondered how this transition from physical to digital has affected our ownership and relations to the digital artefacts. Especially those artefacts that means a lot to us. To build upon this understanding I wanted to investigate how humans relate to digital artefacts and compare them to their cherished physical artefacts to see whether there are any differences.

1.2 Definition and clarification of terms

In this chapter I will clarify and define some common terms and concepts used in this paper.

1.2.1 Physical and digital

Here I will define what i mean when I talk about the physical and the digital. When discussing the physical, I am referring to the three-dimensional world and objects we can see and touch. Digital objects are different from physical objects in that digital objects only consists of binary data, and therefore cannot be touched in the same way as physical objects can be. Examples of digital objects are digital images or e-mails, which consists of only bits. They can also be things like an online video game character or a video game save-file. Digital objects can be displayed on different devices, but the devices themselves are considered physical objects. This distinction is important, as it is common to mix the two when discussing objects such as the smartphone, which has elements of both the physical and the digital. These types of objects are classified as hybrid objects. They are physical instantiations of digital media content which could relatively easily be converted and become part of a larger digital collection, but currently exist in a physical format" (D. S. Kirk and Sellen, 2010). The smartphone is a physical object in itself, but the digital data it contains are considered digital objects. The relationship between the digital and physical are often described through the term "Bits and Atoms" (MIT, 2019). The atoms are the physical form and the bits are the abstract form.

1.2.2 Objects and artefacts

The terms "object" and "artefact" are often synonymously used to describe things we can physically touch. Whereas the term "object" is the more commonly used of the two in everyday talk, the term "artefact" is an important term in the HCI-field (Human Computer Interaction). There are, however, some minor differences between the two terms.

The Cambridge English Dictionary defines an object as: “a thing that you can see or touch, but that is not usually a living animal, plant, or person” (Cambridge University Press, 2022b). This allows the term to encompass every non-living thing. Artefacts on the other hand, is defined as: “an object that is made by a person, such as a tool or a decoration, especially one that is of historical interest” (Cambridge University Press, 2022a). The major difference between the two is the fact that artefacts are man-made. Every artefact is an object, but every object is not an artefact. For example, a large stone you find on the ground is considered an object, but not an artefact. But if you chisel a figurine out of it, it becomes an artefact, since it is now considered man-made. Objects are easily associated with physical things (Golsteijn et al., 2012), even though both physical and digital things fit within the definition. This is one of the reasons why artefact is more commonly used when discussing digital things.

1.2.3 Digital objects and artefacts

A digital object or artefact is any type of item produced and stored as a digital or electronic version. It does not have any physical representation at all, as it consists purely of data. An example to illustrate the difference would be a mobile phone. The physical phone itself is considered a physical artefact, but a digital image saved on the phone is considered a digital artefact. The phone only works as a physical tool to interact with the digital artefact.

1.2.4 Uniqueness

Uniqueness refers to an objects ability to be one of a kind. Some things can be easily duplicated, while others cannot. Individual humans are examples of things with uniqueness. Every human is different from each other in one way or another. Whether it is different hair-color, interests, or height. Their combination of attributes does not exist anywhere else in the world. An example of the opposite is something like a brand-new snowboard or the Microsoft Office software. These objects are not unique in the same way. There exists several thousand identical snowboards and several million copies of Microsoft Office. However, things can be made unique. Say you take the snowboard and draw something on it. This snowboard has now been made unique by there not being any other snowboards with that exact drawing.

1.2.5 The self and identity

The self is the set of someone’s characteristics, such as personality and ability, that are not physical and make that person different from other people (Cambridge University Press, 2022d).The self is everything you can call yours, not only your body and mind. It also includes your possessions, like house, work and reputation (R. W. Belk, 1988). The self is how you perceive yourself. It is closely connected to one’s identity, where identity is how one perceives themselves to be perceived by others (Kelly and Millward, 2004). Identity can be split into personal identity and relational identity. Personal identity is the identity you define yourself on an individual level. This includes your values, beliefs, and goals. Relational identity is the identity presented when interacting with others. Social roles and positions like identifying as a student, daughter, or friend is defined as relational identity (Smelser and Baltes, 2001).

1.2.6 Emotional attachment

Emotional attachment is the positive feeling someone has towards an object. This affection goes beyond the functionality of the item, and could not be replaced by an identical object (Turner and Turner, 2011). It is the distinction between attachment to the thing itself rather than to what the thing provides (Verbeek, 2005). Examples of emotional attachment to objects can be the first special teddy bear you had while growing up or a wedding ring.

1.2.7 Relations

Relations are what connects humans together. The bonds between friends, families, strangers, or colleagues. These relations do not have to be positive or negative, they can also be neutral (Cambridge University Press, 2022c). There are several kinds of relations. In fields like pedagogy, they study human-to-human relations to learn how they can be used to improve learning (McFadden and Munns, 2002). Another type of relation is human-to-object relations. In the same way as humans care about other people, they can care about objects (af Ornäs, 2010). The human-to-object relations are the ones we will be focusing on in this paper.

1.3 Research objectives

The purpose of the project is to build a greater understanding of people's relations to their digital artefacts and examine how these relations differ from the ones people have to physical artefacts. The differences between physical and digital artefacts in areas like maintenance and emotional value can help us design better digital artefacts with a greater personal value. To achieve this, it is essential to understand how people relate to their cherished physical and digital artefacts. There is also a possibility that their relationships to these objects depend on their view of the digital compared to the physical. Therefore, I have formulated three research questions to help us further explore these similarities and differences.

- Research Question 1: What relations do people have to their digital artefacts, and how does this differ from their relations to their physical artefacts?
- Research Question 2: How do people maintain their digital artefacts, and how does this differ from how they maintain their physical artefacts?
- Research Question 3: What do people think about the difference between digital and physical artefacts and how one relates to and maintains them?
- Research Question 4: How does age affect the answer to the three previous research questions?

1.4 Relevance for the school and teaching

The topic is relevant for schools and teaching because of the ongoing digitalization of our society and education system. As technology advances, more and more digital solutions are brought into the classroom to enhance the learning experience. Understanding why we prefer digital things over physical things and vice versa is therefore essential when

considering whether to implement the different digital solutions into a classroom. Having an understanding of how we relate to digital artefacts may help teachers understand why students care about the things they do, and help build better relations with them.

An understanding of how we relate to digital artefacts may also help with course planning and how society works when teaching information technology. By knowing what makes a digital artefact valuable to the individual, it might be possible for the teacher to design course sessions where the participants create their own digital artefacts which they care about.

In Norwegian primary school and high school, the field of informatics does not only include programming skills, but also how technology shapes our society. In the Norwegian curriculum for information technology in high school it says that the student should be able to evaluate current affairs for how information technology affects the individual and society (Utdanningsdirektoratet, 2021). Understanding why we care about our possessions and how there are differences between digital and physical artefacts are essential aspects for understanding why society acts like it does when it comes to technological possessions.

2 Background

Material objects is an important part of human identities and social relationships, but there is a difference in how they are cherished by their owners. The reasons for cherishing these objects depends on whether the objects are physical or digital in nature, (Golsteijn et al., 2012). This chapter examines the recent history of consumer behavior from the 80s and how the view on how participants view their possessions have changed. It will also look at more recent research into digital and physical artefacts and why they are important to us, while exploring some of the challenges with digital artefacts.

2.1 History of consumer behavior research

In the 1980s, consumer behavior theorists started to research how consumers built emotional connections to physical products after purchase. They suggested that peoples' possessions were important for personal identity. This sparked a renewed interest in the topic for psychologists as well, where they were interested in the how possessions play a part in the sense of self and identity (Ball and Tasaki, 1992). A central issue was the extent to which an object was a part of a consumer's identity. Ball and Tasaki (1992) attempted to measure the extent of this attachment by examining how individuals use objects to develop and maintain a cognitive structure of self. They found that the importance of the object relied on its type and which stage of ownership it is at. Figure 1 displays the results Ball and Tasaki (1992) found, which shows that people are more attached to their objects in the earlier stages of ownership, while emotional significance rises as the ownership matures.

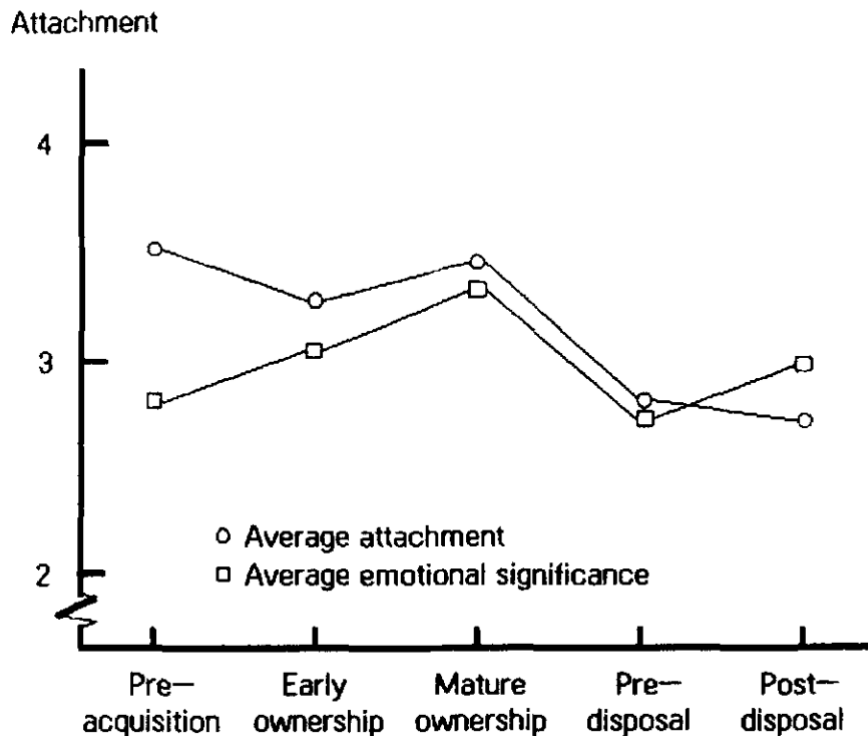


Figure 1: The stages of ownership in Ball and Tasaki (1992)

In the 1990s and early 2000s, research on consumer behavior shifted more towards brands. Companies wanted the consumers to build attachment towards their brand over an attachment to the things they had already bought. They wanted to examine the legitimacy of brands as an active relationship partner (Fournier, 1998). This was considered a paradigm shift for the entire field of consumer research (Deighton and Sorrell, 1996). Researchers wanted to find out whether, why and in what forms consumers seek and value ongoing relationships with brands. They found that personalization of brands made the consumer more attached than as a passive object of marketing transactions (Fournier, 1998). This was around the time where higher-ups companies understood that they get a long-term, sustainable competitive advantage if they manage to retain, sustain, and nurture their customers (Van Doorn et al., 2010).

Consumer behavior theory then evolved as our society and technology evolved. “Nevertheless, it is evident that the current wave of digital technologies is fundamentally changing consumer behavior” (R. W. Belk, 2013). The society was adapting as our technology evolved. Researchers then started to research how consumers felt ownership towards digital technologies (C. P. Kirk and Swain, 2018). They found that digital technology facilitates ownerships through engagement with the technology. Why people cared about their physical things were already established at this point, but digital artefacts have different properties that makes them vastly different from physical ones. Kirk and Swain (2018) found irrefutable evidence that people can feel psychological ownership over digital things, which leads us to where we are today, where researchers are trying to understand how digital objects are different from physical from a consumer perspective.

2.2 Digital objects and their meaning today

With the prevalence of digital objects in society today, there has been an increased interest in how humans build connections to digital objects as well (Turel et al., 2010). The digital market has been booming, and the expectations are that this evolution will continue as technology progresses. A common methodology to learn and understand how humans build attachment to digital objects has been to compare them to physical objects directly or identify the differences (Feinberg, 2013; Golsteijn et al., 2012; Gruning, 2017; Mardon and Belk, 2018; Turner and Turner, 2013). By doing this, researchers found a plethora of reasons and explanations for why digital objects are different from physical ones.

Feinberg (2013) found that people tend to cherish physical objects more than digital ones, and proposes that the digital object’s ability to provide access to an intellectual work is more important than the object as a particular item. It is not the physical vinyl records or CDs that are important, it is the content of them that people consider precious. She points to how this idea might explain why people find value in mass-produced designed items that experience regular versioning (Feinberg, 2013). The next version of an iPhone is generally more desirable than the last, which makes recency important. The new designs focus on significant functional improvements and benefits, but leave out the material properties which might be possible in digital artefacts (Jung et al., 2008). An example of a type of digital artefact Feinberg (2013) discussed a lot was digital images, where she pointed to the content of the image being more important than the image itself. Digital images are often valued for what it represents, not for its status as an object. (Feinberg, 2013). However, digital images can also be used to display things you do not have. Studies found that teens often used digital images as backgrounds on their devices to display things they wish they had or future aspirations, as well as artefacts or people they miss. This gives the images themselves a higher meaning for the owner than what they simply display (Odom

et al., 2014).

A major challenge for digital artefacts today is that people tend to think of digital artefacts as unstable, volatile and that they do not feel real compared to physical artefacts (Gruning, 2017). Gruning (2017) chose to focus on how relations to digital artefacts are limited by ownership. The context of digital ownership matters. People value digital artefacts which they perceive as their own more than digital artefacts perceived as owned by others. By using e-books as an example, they found that the feeling of ownership is also affected by how the digital artefact is stored. Participants felt more ownership over their digital artefacts if they were stored as a file on their computer, than if the digital artefact was stored on an account online.

Ownership is one of the major challenges with digital artefacts. When asked about their digital possessions in online video games, participants said that they feared for the safety of their digital objects (Watkins and Molesworth, 2012). Lack of control was a huge part of this fear. Digital objects in online video games cannot be backed up like those stored locally on the participants' computer. This resulted in some of the participants detaching themselves from their virtual possessions as a defense mechanism in case they were to lose them. This was especially common in subscription-based video games. "The denial of legal ownership in favor of an on-going subscription model means that cherished possessions within videogames are no more than leased from commercial organizations" (Watkins and Molesworth, 2012).

Zijlema et al. (2016) defined a new category of cherished items called companions. "They are mundane objects that accrued meaning over time, and evoke tiny pleasures when we interact with them" (Zijlema et al., 2016). Digital artefacts have qualities that physical artefacts do not, and the other way around. A big difference between digital and physical artefacts are the material properties. Physical artefacts often have properties which can engage all of our senses, while digital artefacts usually only engage the visual and auditory senses. Since companions often are more mundane objects, like a favorite pencil or favorite screensaver on the computer, owners usually understate their importance. Therefore, objects classified as companions are rare in research in the field. Companions are still rare when it comes to digital artefacts, but it provides some insight into methods for designing and creating more valuable digital artefacts.

Several studies have shown that we have more issues with identifying cherished digital objects than physical ones (Golsteijn et al., 2012). Despite this, it is found to be beneficial to cherish some digital artefacts. The format of these digital artefacts have a great influence on how important they are. Golsteijn et al. (2012) found that the best way to create digital artefacts with personal value was to transfer the properties of physical artefacts over to digital ones. Examples of this was to design ways for the digital artefacts to be more visible in the home and making digital artefacts more unique.

2.3 Digital artefacts and uniqueness

When Petrelli and Whittaker (2010) asked participants in their study to show them significant physical and digital items, they found that only a small amount of participants showed them physical photos. These photos were often not available in other versions, making them unique and irreplaceable to the participants. When the participants showed digital photos, they often showed images they or someone they know had created or that documented personal experiences (Petrelli and Whittaker, 2010).

Petrelli and Whittaker’s (2010) study shows that a major challenge for digital artefacts are their uniqueness. Digital objects are usually abundant and ubiquitous, which raises questions around their unique value. Many companies have tried to work around this issue by making it harder for consumers to copy their possessions, but they still struggle with the limitless quantity of digital items (Mardon and Belk, 2018). They can often be copied and saved with little effort to ensure safety, which makes several copies of the same object common. When an object is not unique, it does not have the same history as a similar physical object has. Physical objects can have their own biographies, where they are shaped by where they have been and who has owned them. This is not the case with digital objects, as they are not defined as a singular object in the same way as physical objects are. This creates challenges around the authenticity of digital objects, as a digital object might not have the same distinct history that connects it to people, places or history (Mardon and Belk, 2018). Passing a digital object along to someone else usually involves creating a copy of the object and passing the copy along instead of the original one (Golsteijn et al., 2012; Mardon and Belk, 2018). This makes the history of the object less important. This effect is enforced by the lack of aging in digital artefacts. They do not have the same aging process as physical objects, which allows them to be perceived as brand new every single time they are used or interacted with (Mardon and Belk, 2018).

2.4 Artefacts and emotional attachment

Physical and digital artefacts have a lot in common when it comes to emotional attachment, where people consider both the content of their computers and their physical possessions as part of who they are, (Turner and Turner, 2013). Through their studies, Turner and Turner (2013) found there to be no difference in emotional attachment to digital and non-digital artefacts. People are attached to the digital things themselves (Turner and Turner, 2011). Emotional attachment to a possession is different from merely “liking” it, where people show more resistance towards replacing the object, even with a similar object (Watkins and Molesworth, 2012). The objects are often felt by their owners to be irreplaceable and are often kept for longer than they usually would; even after their functional value is long gone. However, these kinds of possessions do not necessarily keep their emotional value over time. They may lose their sacred status, due to negative associations, other competing objects, or lack of space. The objects do not necessarily need to be legally owned by the individual, but they must perceive it as their possession.

Different events can affect the relationship a human has to a specific possession, depending on the role the possession played in the event. This may change the emotional responses whenever they interact with the possession (af Ornäs, 2010). It was found that this emotional attachment seemed to improve with age for physical artefacts, but not necessarily for digital artefacts (Turner and Turner, 2011). The reason for valuing digital objects depends how the object was created and who they received it from. Something home-made will often have an increased emotional value, due to the sense of pride and accomplishment in the creation (Golsteijn et al., 2012). Emotional attachment to objects is often increased when the artefact is a gift, as it helps remind the owner of the giver (Turner and Turner, 2011). This points to the importance of how the object was acquired for emotional attachment. Some methods of acquisition of artefacts has a positive impact on the feeling of attachment to the object and the perceived ownership, which can often become an issue with digital objects due to how they are generally accessed and stored (Gruning, 2017).

Sentimental artefacts are important for several reasons. They are used to share something and connect with others, to fulfill obligations and help us with the efforts of remembering

(D. S. Kirk and Sellen, 2010). Not only are they essential for remembering things, but they also allow us to safely forget. Some sentimental artefacts are too important to discard but represents something we do not want to remember either. They must therefore be safely hidden away where they are less likely to be accessed. Sentimental artefacts are not only important for remembering the past, but they are also important for the present. This gives sentimental artefacts a more important role than just that of a memento. Examples of this are for displaying status, helping people with a sense of duty or even help people forget the past (D. S. Kirk and Sellen, 2010).

The role of attachment is often neglected when objects are being digitized (Zijlema et al., 2016). A lot of digital artefacts are designed with functionality in mind, making them lose the individuality that makes their owners get attached to them. The user might be able to customize the design of different softwares to personalize them aesthetically, but there is little to allow for the creation of emotional bonds. Zijlema et al. (2016) uses notebooks as an example of this, where personal physical notebooks allow for the user to scribble and add personal touches to them, while all the notes in the digital notebook on the phone looks exactly the same. This makes it harder to build emotional attachment to them.

When users dedicate themselves to a virtual environment, they increasingly develop a sense of psychological ownership and belonging towards digital objects in that virtual environment. This is especially common in online games, where players can dedicate themselves to their avatars. They then build an emotional attachment to the character as they dedicate their time to it (Koles and Nagy, 2021). Given the amount of time that must be invested in video games to level up, it makes sense that we may become attached to the virtual equipment we have worked for and acquired. This includes the virtual structures we have built and the virtual clothing and accessories we have chosen, crafted or purchased (R. Belk, 2014).

Meschtscherjakov (2009) argues that all emotional attachment to technology lies with it being an extension or expression of its user or owner. He uses mobile phones as an example, where he says that we are not emotionally attached to the phone itself, but rather what it allows us to do. They allow us to stay in contact with friends and family, access information from everywhere, be entertained and capture memories in the moment. This makes the mobile device an extension of ourself (Meschtscherjakov, 2009).

2.5 Artefacts and identity

Throughout our lives there is a massive number of objects and possessions that come and go. Out of all these things, only a handful of them are loved and valued. Those are the objects that play a special role in consumers understandings of who they are as people (Ahuvia, 2005). In the early 2010s Russel Belk tried to incorporate the digital into his theory of the extended self (R. Belk, 2014; R. W. Belk, 2013). He wrote that our identities now embody not only our physical body, but our digital bodies as well. How we represent ourselves on the internet is now a part of our identity. Belk (2013) calls this a re-embodiment of the self (R. W. Belk, 2013). He then later defines the digital body, which is what he calls our online presence freed from our physical bodies (R. Belk, 2014). Besides different digital devices and avatars in the online space, digital possessions are now also an important part of the extended self. Our digital possessions are as important as physical possessions to how we define ourselves, but physical possessions are generally more attached to the self than digital ones.

“Objects often become cherished for their ties to beliefs, experiences, memories, people, places, or values that are significant to their owner” (Orth et al., 2018) These ties show how we humans use objects to develop our sense of self. It is generally understood among researchers that people develop attachments to objects for their role in an aspect of their self-identity. It can either be for its construction, maintenance, or development. Objects also become valuable to the individual for their ability to display their personal value, reflect their ties with friends and family, or allow them to engage in fulfilling activities (Orth et al., 2018). It does not matter whether the objects are physical or digital, what we cherish is an important part of our identity.

Kirk and Sellen (2010) also points to how our artefacts are not only important for our own identity, but for our family identity as well. Physical and digital artefacts can be used to create a family identity, by helping define a group of people as a family. They are used to help demonstrate affection for one another, link the family together in shared past events, or create a shared public face of the family (D. S. Kirk and Sellen, 2010).

There are some distinctions in the previous research between explicit identity and implicit identity. Explicit identity is when the participants directly talk about their identity, where implicit identity is where the participants does not discuss identity. Instead, the identity is identified by the researchers during analysis of the data. This is due to the researchers choosing an etic approach to their studies instead of an emic one. Emic refers to an “insider perspective”, where the researchers have personal experience with the culture or society they are studying. An etic perspective on the other hand, refers to an “outsider perspective”, where the researcher has the perspective of a person who has no personal experience in the particular culture being studied (Young, 2005).

2.6 Connections between the digital and the material

Digital possessions are usually linked to material forms which are required to be able to view or display the object, as they can often be transferred between them with little effort. This makes it difficult to separate the physical and digital forms integrated within a single possession when investigating attachment to digital objects (Orth et al., 2019). To get around this problem, Kirk and Sellen (2010) chose to separate objects that people cherish into three categories: physical, digital, and hybrid.

”Hybrid objects are physical instantiations of media content such as cassette tapes, video tapes, CDs and vinyl records. These items could relatively easily be converted and become part of a larger digital collection, but currently exist in a physical format” (D. S. Kirk and Sellen, 2010)

This definition solved the problem pointed out by Orth et al. (2019). In the hybrid category, the physical object itself held little to no sentimental value whatsoever, it was the content which was considered very precious. They found some situations where the format had some significance, but these situations were uncommon. These exceptions were often objects like vinyl records with a specific piece of art on the sleeve, but the contents were seen as more important (D. S. Kirk and Sellen, 2010).

When researching digital and physical objects, the term “object” has been found to be problematic when discussing digital objects. The reason for this is that people often have some difficulties thinking about digital objects without relating it to something physical

(Golsteijn et al., 2012). In Golsteijn et al. (2012) this resulted in some participants choosing digital artefacts which were classified as hybrid or physical according to their classification. How the participants experienced the object was important for their understanding of it as an object. More and more digital objects are of “blended materiality”, meaning that there is a combination of digital media with a variety of physical products. “The discreteness of physical and digital is fading and the integration of both seems a promising area for the design for cherishable digital objects” (Golsteijn et al., 2012). This points to the fact that the gap between physical and digital artefacts is closing.

3 Research Method

Choosing the correct strategy and method when conducting research is key. Just like a solid house needs a blueprint designed by a skilled architect, rigorous research needs a good research design. “Research design has great bearing on the reliability of the results arrived at and as such constitutes the firm foundation of the entire edifice of the research work” (Kothari, 2004).

A good research design is a design that limits biases and makes the data collected as reliable as possible. Research designs with a low chance for scientific errors are usually the best ones. While reducing errors, the research design should also provide as much information as possible while considering the different aspects of a problem (Kothari, 2004). These factors may change from research question to research question, which means that a research design might fit perfectly for some problems while being lacking for others. This is exemplified when deciding on a research design for exploratory or formulative research study. In an exploratory research study, the focus is on new ideas and unexplored concepts, which means that it benefits from a flexible research design where it is possible to consider the different aspects of the findings.

In *Researching Information Systems and Computing* (Oates, 2005), Oates presents a model for research design for information systems and computing (Figure 2). This model presents the different stages of the research process, while presenting some common strategies and data generation methods. This model is mainly designed for IT related research and might not be fitting for other fields of research.

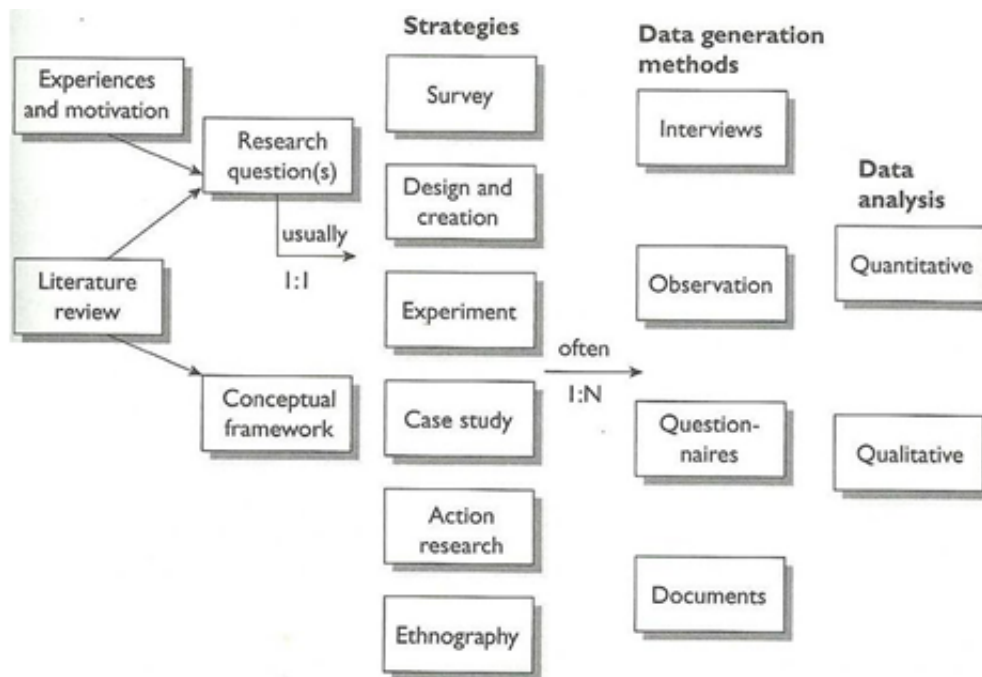


Figure 2: Oates (2005) Model of the Research Process

All research starts with personal experiences and motivation. Reflecting around your own motivations and experiences helps with thinking about and formulating good research questions, which may increase the quality of the research. Together with a literature review of existing academic literature, it is possible to formulate solid and interesting research

questions. The literature review also leads to a conceptual framework, which helps the researcher structure how they think about the process and research topic (Oates, 2005). “A conceptual framework makes explicit how you structure your thinking about your research topic and the process undertaken” (Oates, 2005).

3.1 Research strategies

The next step of the research process model is planning the research strategies you are going to utilize as a researcher. Here, Oates (2005) presents 6 different strategies. The first strategy is the survey, where the main goal is to obtain similar data with a large sample size. This data is then used to generalize and identify patterns that might be applicable to more people than the participants in the study. Design and creation is the second research strategy proposed in the model. This strategy focuses on developing new IT products. Compared to regular design and development of a new product, the design and creation strategy requires a higher degree of academic qualities not necessarily present in normal development. A goal is also to use this new product to acquire some form of new knowledge, through exploring uncertainties in the design which would be left out in regular development. The third strategy is the experiment. This strategy is best suited for cause-and-effect research. The goal of the research is to prove or disprove hypotheses or links between a factor and observed outcomes. A case study is the fourth strategy in the “Model of the research process” (Oates, 2005). In a case study the research is focused on one instance of what is being investigated. This strategy focuses on deep insight into the case, with its relationships and processes. The fifth strategy is action research. This is a cyclical research strategy, where the researcher plans to do something in a real-world situation. After doing so, they reflect on how it went before iterating on it and starting the planning anew. The final research strategy is the ethnography. This strategy focuses on understanding a group of people and their culture. By partaking in the culture and spending time within the group, the researcher gains new insight which would otherwise have been lost if the researcher was a detached observer (Oates, 2005). Typically, one research question has one strategy.

3.2 Data generation methods

After deciding on a research strategy, the next step is to decide on how the empirical data should be generated and collected (Oates, 2005). Data is usually separated into two categories: qualitative data, and quantitative data. In the book *Researching Information Systems and Computing* (Oates, 2005) only four means of data generation is presented, but there exists other approaches to data generation. These four methods are interviews, observations, questionnaires, and documents.

3.2.1 Interviews

Interviews are conversations between researchers and participants about specific topics, where the researcher is usually the one who leads the conversation and asks the questions. Interviews can either be conducted one-on-one or in groups depending on what is required for the research project. In group interviews, the goal is to create a healthy discussion within the group instead of interviewing each participant separately. Group interviews require a different skillset from the researcher than one-on-one interviews, as moderation

skills become a lot more important.

Interviews are usually categorized on a scale from structured to unstructured, with semi-structured somewhere in-between them. In structured interviews the participants are asked the same pre-determined, standardized, identical questions (Oates, 2005). The goal of structured interviews is for the researcher to have as little influence on the answers as possible. Unstructured interviews on the other hand, are interviews where the researcher has a lot less control of the conversation. It usually starts off with only a topic to discuss, instead of pre-determined questions. The researcher lets the participants develop their ideas and reflect on their own, without leading the conversation or intruding. In-between these two types of interviews, we have the semi-structured interview, where the researcher has a list of topics and questions they would like to cover, but the order depends on the flow of the conversation. Semi-structured interviews try to keep the free-flowing conversation from unstructured interviews, but with an agenda of questions or topics more similar to structured interviews.

Interviews have different strengths and weaknesses, which needs to be considered when deciding on whether they fit in the research design. One of the major strengths of interviews is the possibility of adapting the questions on the fly. Should a participant bring up something interesting, it is possible for the researcher to adapt to further explore these topics. This allows the researchers to potentially go more in depth than with other data generation methods. The main downside of interviews is that the data they provide often require a lot more resources to transcribe and process than other data generation methods like questionnaires.

3.2.2 Observations

Observations focus on what people do instead of what they say that they do (Oates, 2005). However, this data generation method does not necessarily only involve watching the participants. Other senses such as the researcher's smelling or hearing can also be used to gather data. Observations are often categorized into systematic and non-systematic observations. The role of the researcher can also vary. In some observation situations it might be beneficial for the researcher to participate, while it may be more beneficial for the researcher to be a fly on the wall in others. Observations can last anywhere from a couple of minutes to several years, and the participants' knowledge of the observations can vary from fully informed to no information given at all.

The main strength of observations is that the researcher may notice events or details that the participants themselves may not think of as noteworthy. Objectivity is key when using observations as a data generation method. Since the researcher is the one making the observations, they decide what is important enough to include in the researcher notes. A skilled researcher will be able to stay as objective as possible and look at the larger picture while picking up the minor details others might miss.

3.2.3 Questionnaires

Questionnaires are written questions designed to gather data on a large scope within a certain topic (Oates, 2005). They can either be multiple choice or with more open-ended questions depending on the research design. Multiple choice questions are usually used for larger quantitative studies, due to them being easier to standardize and analyze.

They are often a natural fit with the survey research method, due to the possibilities for standardizing the responses. The questionnaire can be administered with or without the researcher present. This depends on the difficulty of the questionnaire and how the researchers want to guide the participants. Questionnaires without a researcher present are called self-administered questionnaires, while researcher-administered questionnaires are answered with the researcher present.

The main upside of questionnaires is their efficiency. It is a lot easier to gather data from a large group of people with questionnaires compared to for example interviews. However, if the researcher finds anything interesting in the analysis, they are not able to ask follow-up questions to further explore the potential findings. This results in the risk of questionnaires lacking the depth gained from other data generation methods like interviews.

3.2.4 Documents

The final data generation method in the Model of The Research Process (Oates, 2005), is the one called documents. In the documents data generation method, data is gathered using documents and pre-existing statistics. These can be found documents, which were created prior to the start of the research project, or researcher-generated documents which are put together solely for the research task. The researcher-generated documents can for example be field notes or diagrams associated with the design of an IT-artefact.

The documents data generation method has the unique property of being the only data generation method in the Model of The Research Process (Oates, 2005) which uses pre-existing documents. The notes can be created by someone other than the researcher without the researchers' influence. It is beneficial for situations where the phenomenon being researched is something that happened in the past and cannot be recreated by the researchers. The main challenge with documents is that there can often be an overwhelming amount of existing data, which means that filtering out the relevant information can require a massive amount of resources.

3.3 Data analysis

Closely related to the research strategy and the data generation method, is the data analysis. This usually depends on the methodology of the research design, the sample of participants, and the form of the data generated by the data generation methods. Data analysis is often categorized into quantitative and qualitative analysis. Their relationship can be described as width versus depth, where quantitative data analysis represents width and qualitative data analysis represents depth.

3.3.1 Quantitative analysis

Quantitative data analysis is usually utilized when you want to measure a phenomenon (Langridge, 2006). These data are usually number-based statistical data, where the idea is to look for patterns in the data and draw conclusions which can be generalized to a larger population (Oates, 2005). Quantitative data is often generated by research projects with a survey- or experiments-based research strategy. These quantitative data can then be categorized according to their form and content. They are often classified as either nominal data, ordinal data, interval data or rational data. Nominal data is data that has

no numerical value. This can for example be the participants' gender. These answers can be translated into numbers if the researchers prefer it, but mathematical analysis would not yield any meaningful results. Ordinal data is data where the numbers are put on a scale. Examples of this could be the grades of students in a university course or questions with a scale of "strongly disagree", "disagree", "neutral", "agree" or "strongly agree" (Oates, 2005). Interval data is like ordinal data, but the differences between the categories are constant and proportionate. There is no true zero in interval data, which means that there is no lower limit to how low the answers can go. Ratio data is almost the same as interval data, but there is a true zero. This means that the data can never go below zero. There can for example not be a negative amount of traffic incidents in a year or someone's age cannot be a negative number. The lowest answer possible is always zero.

3.3.2 Qualitative analysis

Qualitative data analysis is usually used when you want to explore a specific phenomenon (Langridge, 2006). Qualitative data usually includes all non-numeric data, which cannot be put into graphs and diagrams as easily as quantitative data types (Oates, 2005). Qualitative data is usually more common when the research design utilizes research strategies such as case studies, action research, or ethnographies. "Qualitative data analysis involves abstracting from the research data the verbal, visual or aural themes and patterns that you think are important to your research topic" (Oates, 2005). When working with qualitative data analysis, most of the resources are spent on breaking down the raw data into readable formats which then can be coded, categorized, and sorted.

3.4 Participants and sampling

Population validity is how results from a study can be generalized to a larger group. This depends on the sample size in the study, where a larger sample size usually increases the significance of the findings (American Psychological Association, 2020). Effective methods for picking the participants and deciding on sample size is important to achieve population validity and generalizability (Langridge, 2006). The optimal sample size depends on the research design, and especially which type of analysis is going to be utilized. A quantitative analysis requires a larger sample size than a qualitative analysis to yield significant results. For qualitative studies, the concept of saturation is used to determine sample sizes. "Saturation is defined by many as the point at which the data collection process no longer offers any new or relevant data" (Dworkin, 2012). For qualitative studies the number of participants recommended is usually somewhere between 5 and 50, but it depends on other factors such as the scope of the study, the resources available and how heterogeneous the population being studied is.

There are several different strategies for choosing participants and setting a sample size. These strategies have different strengths and weaknesses. They are usually separated into two categories: probability and non-probability sampling (Oates, 2005).

3.4.1 Probability sampling

Probability sampling is a term for sampling methods where it is believed that there is a high probability that the sample of respondents are a representation of the overall population

(Oates, 2005). Some examples of probability sampling strategies are randomized sampling, systematic sampling, stratified sampling and cluster sampling.

Randomized sampling

Randomized sampling is often considered the golden standard for how sampling is done (Langridge, 2006). In randomized sampling, everyone has an equal chance of being picked as a participant. “People or events are selected literally ‘at random’” (Oates, 2005). The biggest strength of a randomized sample is the generalizability, assuming the sample size is big enough (Langridge, 2006). The main problem with this sampling method is that it is in practice close to impossible to utilize. This is due to the difficulty of accessing the entire population. It is very hard to remove biases from sampling, but randomized sampling is the sampling method which comes the closest to a completely objective sample.

Systematic sampling

Systematic sampling ends up being a realistic replacement for randomized sampling (Langridge, 2006). In this methodology for sampling, participants are picked from a list at random intervals. The issue with this sampling method is that the lists may have been sorted in advance, leading to biases in the sampling. In spite of this, it keeps the benefits of being randomized.

Stratified sampling

In stratified sampling, the sample is designed to match the general population they represent (Oates, 2005). For example, if you do research on people who work in a specific company. If 65% of the people who work there are female and the remaining 35% are male, the sample should reflect this. 65% of the sample should be randomly picked from the list of female employees and 35% should be randomly picked from the list of male employees. There are a lot of factors that can be used to stratify a sample (Langridge, 2006). One of the main upsides of this is that we can be sure that the sample reflects some traits of the population we want to examine.

Cluster sampling

Cluster sampling differs from the rest of the probability sampling methods, where you pick groups of people instead of individuals (Langridge, 2006). For example, when doing research in schools, it might be better to choose entire grades instead of individual pupils for practical and ethical purposes. This sampling method is a good choice whenever the researcher wants naturally occurring groups of people (Oates, 2005). An upside of this sampling method is that the entire sample is usually more accessible to the researcher, as they are often naturally gathered in one spot. This means that researchers can cut down on traveling time and costs. The downside is that the cluster sample might not be representative of other groups. An example of this might be the differences between pupils in the city compared to pupils in the countryside.

3.4.2 Non-probability sampling

Non-probability sampling is considered the opposite of probability sampling. In these sampling methods the researcher has direct control over who is included or excluded from the sample. When non-probability sampling methods are utilized, the researcher cannot know for certain whether the sample is a representation of the general population (Oates, 2005). The participants may have unique traits or characteristics that are not shared with the overall population. The most common non-probability sampling methods are purposive sampling, self-selection sampling, convenience sampling and snowball sampling.

Purposive sampling

In purposive sampling, the researcher hand-picks the sample. The participants are people who are likely to produce valuable data to meet the purpose of the data (Oates, 2005). The researcher can choose participants to ensure a wide variety. The danger is that the researcher might choose cases which are too extreme. This might affect the findings, leading to more extreme results than what is the case. The researcher's biases while choosing the sample might also change the findings in the study.

Self-selection sampling

Self-selection sampling is a sampling method where the participants themselves decide whether they want to contribute or not. The researcher advertises their study on a particular topic to a particular group. They then collect data from every respondent (Oates, 2005). An upside of this method is that it helps the researcher if they do not know who to contact. The potential downside of the sampling method is that people who volunteer for studies usually have strong feelings for the topic. This may result in the findings not being a representation of the wider population.

Convenience sampling

In convenience sampling the researcher simply chooses the participants who are convenient to them. This might be because they are close by, easy to reach or easy to help. This is why a lot of studies up through history has used students as subjects, because they are convenient for the researcher, even though they may not represent the general population (Oates, 2005). The major upside of this sampling method is that it is cheap, which may be relevant if a study lacks funding. It can be considered an acceptable sampling method if the findings are expected, but it is important to be extra attentive if the results show anything questionable (Langridge, 2006).

Snowball sampling

Snowball sampling is a quite unique sampling method, where the participants themselves partake in the recruitment process. The researcher starts out with one participant within the target population. After gathering data from that participant, the researcher asks for suggestion for other potential participants. These are approached by the researcher, with having the advantage of being introduced by someone else. This cycle then continues until the sample size is large enough (Oates, 2005). Snowball sampling has some of the same problems as convenience sampling, due to the risk of a limited variety in the sample (Langridge, 2006). Despite this, snowball sampling is a great sampling method if the researcher needs to find people within the target group (Oates, 2005). The sampling method can also be combined with purposive sampling, by having the researcher explain the requirements of the target group.

3.5 Research design

Researching Information Systems and Computing (Oates, 2005) breaks down the research process into stages to create an overview of the project. This project's research design is based on the model defined in this book. Figure 3 displays an overview of the model, where the red squares marks the strategies and methods relevant to this research project. These red squares encompass the choices for all four of the research questions. However, the research design will be similar for all of the research questions due to the size of the research project.

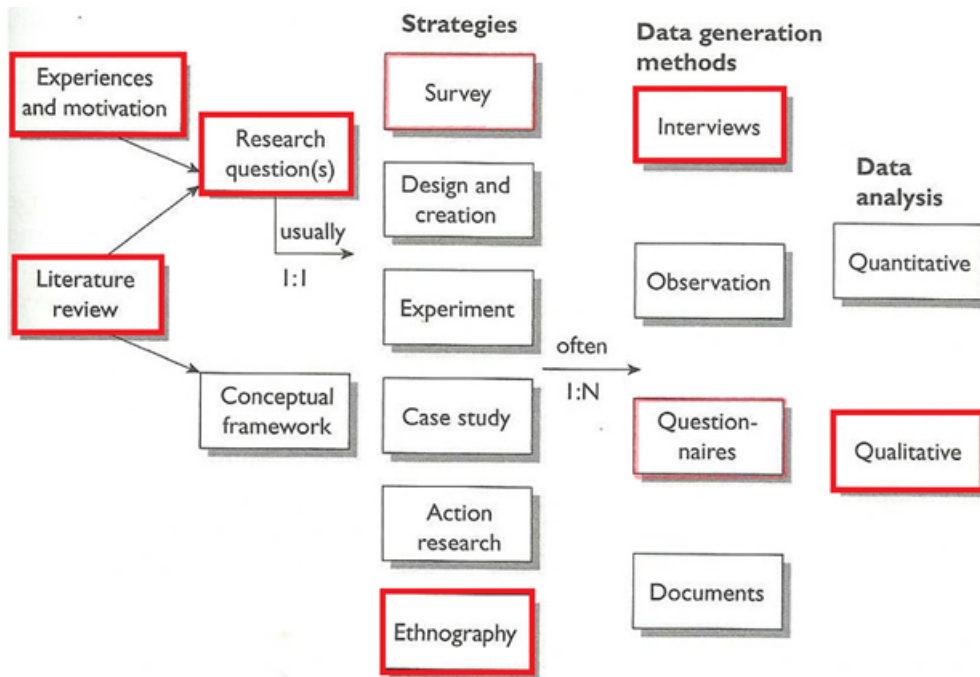


Figure 3: Oates (2006) Model of the Research Process with added red markers for parts relevant to this paper

3.5.1 Research question 1

RQ 1: What relations do people have to their digital artefacts, and how does this differ from their relations to their physical artefacts?

This research question will be answered by using an ethnography-based research strategy with elements of the survey research strategy. To gather data, we will use semi-structured interviews as the main data generation method, with open-ended questions prepared beforehand. The main goal of these questions is to survey the difference between the precious physical and digital artefacts described by the participants. For the physical artefacts, the research question is covered by the questions:

- Can you describe a physical thing which means a lot to you?
- What is the story behind this thing?
- Why is it special to you?

The three questions will explore one of the participants physical artefacts, the story behind it, and why it is special to them. For the digital artefacts, the research question is covered by the questions:

- Could you describe a digital thing/object which means a lot to you? This can for example be e-mails, images, files, or video game characters.
- What is the story behind this thing?
- Why is it special to you?

These three questions will explore one of the participants digital artefacts, the story behind it, and why it is special to them. These questions are represented as question one, two and three for the physical artefact, and question five, six and seven for the digital artefact in the interview guide (Appendix A for the Norwegian version used in the actual interviews and appendix B for the English translated version).

Ethnography is the chosen strategy, with some elements of a survey research strategy. The main goal of the research question is to gain an understanding of how people relate to digital artefacts. To do this it is important to talk to and try to understand how the participants think. At the same time, I want to try to generalize the findings in the end. This generalization is the reason why the research strategy of choice is not a pure ethnography strategy. To be able to generalize, we need to be able to produce systematic data. This systematic data will then be analyzed to examine whether there are any patterns that can be generalized to the larger population. The survey-strategy excels when the overall goal is generalizability. Surveys are usually associated with large quantitative studies with a positivist research paradigm (Oates, 2005). However, they can also be adapted to fit an interpretivist approach. These are the elements of the survey strategy I want to combine with the ethnography. The reason ethnography fits well to this research question is that I want a deeper understanding of why people think about their artefacts as they do. The goal is to go deeper than what is usually done in a survey-based strategy, as these strategies are often shallow (Lazar et al., 2017).

The main data generation method chosen are interviews. The research question is asking for people's subjective thoughts around their personal physical and digital artefacts. How people talk about and describe the artefacts is an important element of their relations. Interviews are a great fit to be able to capture their wording and tone of voice, compared to for example questionnaires, where subtle communications like tone of voice and body language would be lost. Observations would not be effective either. It is possible to observe how the artefacts are interacted with, but that would only yield surface level data which does not necessarily reflect what the participants feel and think. By using semi-structured interviews to gather data, am I able to create interviews where the participants can express their thoughts and feelings freely, while structuring the answers systematically for later analysis.

3.5.2 Research question 2

RQ 2: How do people maintain their digital artefacts, and how does this differ from how they maintain their physical artefacts?

This research question will be answered through the same semi-structured interview as RQ1, using a survey-based strategy with interviews focused on maintenance as a data generation method. By separating the interview into two parts, we get comparable data for both physical and digital artefacts. This research question is covered for physical and digital artefacts with the question: "How do you maintain this thing?" This question is asked both when the participant is discussing their physical artefacts and their digital artefacts. These questions are represented as question four and eight in the interview guide (Appendix A for the Norwegian version used in the actual interviews and appendix B for the English translated version).

Like with RQ1, the chosen strategy for this research question is the ethnography strategy with elements of the survey strategy. I want to learn how the participants maintain their artefacts and categorize the answers. Therefore, it is important to have systematic data

which can be categorized. I am interested in how they maintain their current artefacts in general, which means that research strategies based on creation of situations or objects would be a bad fit. Surveys would be more natural in this case since the strategy excels at searching for generalizable trends and patterns. Even though I want to generalize the data, it is important to build an understanding of where the participants are coming from. Influences such as social standing, their economy and culture might change their responses.

This is a research question which could utilize several data generation methods. It is possible to argue that either documents, questionnaires, or interviews could fit. The document in this case would be the objects themselves. In most cases it would be possible to inspect the artefacts to see whether they have been maintained or not. For digital artefacts it might be possible to check their log to see if they have been updated or changed recently. The main problem with this approach to data generation in this case is that digital artefacts do not experience the same wear and tear as physical artefacts if they are neglected (Watkins and Molesworth, 2012). This means that I might get data which does not reflect their owner's mindset and actions. A questionnaire would be a great fit for this research question, due to how it can benefit from a more objective measure of the participants maintenance. It is easy to create standardized questionnaires which explores the participants stance on this maintenance. Despite this, the data generation method of choice is interviews. The main reason for this choice was that the same themes are being discussed in RQ1. It is easier for the participants of the study to only participate in one larger interview, compared to answering several questionnaires and participating in one interview. This is not the only reason for this choice. In an interview, the participants can explain their mindset and efforts to maintain their artefacts more in depth than what they could do in a questionnaire. Using the same semi-structured interview as in RQ1 is therefore the preferred data generation method.

3.5.3 Research question 3

RQ 3: What do people think about the difference between digital and physical artefacts and how one relates to and maintains them?

This research question will also be answered using the same ethnography-based strategy as RQ1 and RQ2. The data generation method will be the same as well. By asking the participants: "What do you think about the difference between how we relate to physical and digital things?", I will put a spotlight on what the participants themselves think about physical and digital artefacts. This research question is meant to survey the participants' personal opinions on the subject. It is therefore natural for the research question to be the ninth one in the interview guide (Appendix A for the Norwegian version used in the actual interviews and appendix B for the English translated version) and final one in the interview.

In this research question I want to examine how the participants view digital and physical artefacts in relation to each other. Here the participants' own perception on the topic is the main focus. I want to survey how this is different from individual to individual to look for generalizable patterns. The strengths of the survey research strategy are the best fit to achieve this goal. At the same time, I want the depth of an ethnography. Hence why it is optimal to go for a similar research strategy to the previous research questions.

RQ3 will be answered in the same interview as RQ1 and RQ2. This research question has a lot in common with RQ1, where I want the participants' views on digital and physical artefacts. The main difference is that in RQ1, the participants describe their own artefacts,

while in this research question the focus is to a larger degree on the overall idea of digital artefacts and how they are different from physical ones. This depth is best captured in an interview, where the participant can reflect out loud and I can follow their thought process. The thought process cannot be captured in a questionnaire in the same way as it can in an interview, where the interviewer can ask follow-up questions to make the participant elaborate.

3.5.4 Research question 4

RQ 4: How does age affect the answer to the three previous research questions?

This research question is different from the others, since it is a culmination of the answers to RQ1, RQ2 and RQ3, but with the added parameter of age. It will also be answered using an ethnography-based research strategy. By choosing a sample where 50% of the participants are over 30 years old and 50% of the sample is between 18 and 29 years old, will we have two separate samples based on age. The data generation method we will use the same interview as in the previous research questions, but it is combined with a questionnaire which includes the age of the participant.

Due to the unique nature of this research question, the research strategy will be a combination of the strategies from the previous research questions. This means that it will build upon the data of RQ1, RQ2 and RQ3 and combine it with data from a questionnaire. The research strategy will therefore be an ethnography in the sense that all the previous research questions use ethnography as their research strategy, but it will also be a survey due to the data generation for this specific research question. This is a good strategy to answer this research question, since surveys are best used when you want to gather shallow data quickly and with low effort (Lazar et al., 2017).

The research question uses a questionnaire as data generation method. This information is gathered with the questionnaire that checks whether the participants fall within the inclusion criteria of the study. Questionnaires are fit as the data generation method for this research question, since age is simple numbers that can be categorized and collected easily. Using anything else would require an unnecessary amount of work for the participant, which is why the simplicity of a questionnaire is appealing. The questionnaire has close-ended questions with checkboxes the participants can check. This is to keep the questionnaire as simple as possible and reduce the average answer time.

3.5.5 Participants and sampling method

The participants were sampled using the snowball sampling method. By starting with a couple of potential participants, they were asked whether they knew someone who might be interested in participating. This way, the research project managed to recruit new participants. This sampling method was mainly chosen due to the scope of the study. It did not have the time and resources available to sample from a large pool of people. The main issue with this choice is that I cannot guarantee that the participants are a representation of the general population. A probability sampling method like systematic sampling would be optimal to increase the odds of the results being representative of the larger general population. There were not any known established groups of potential participants to contact regarding the study, which meant that I had to seek out potential participants ourselves. This limited me to non-probability sampling methods.

The choice was either self-purpose sampling, convenience sampling and snowball sampling. Self-purpose sampling would be ineffective at reaching potential participants in the age group above 30 years old due to them frequenting other environments than I do. Most businesses also have strict advertising rules. To try to avoid as much researcher bias as possible, the choice then fell to snowball sampling. While snowball sampling and convenience sampling is similar, the main difference is that the researcher has less control over who the first participants recommend. It is also beneficial as a sampling method where the researcher can get in contact with groups of people previously unavailable to them (Oates, 2005).

As a qualitative study, the sample size is naturally small. Since the goal is to go in-depth on the topic, it is not possible to have a large number of participants. At the same time, the goal of the study is to look for potential patterns that can be generalized. This leads to a problem where you want as large a sample size as possible to make sure that the findings are significant, but a large sample size requires an incredibly large number of resources in a qualitative study. Therefore, the sample size had to be a balance between the two. Since this is dependent on the findings, I found 16 participants as a good starting point. 16 participants split into two groups of eight is a sufficient number of participants considering the scope of the study and the resources available. I found this sample size to be large enough to identify different trends, which can then be further explored later.

The inclusion-exclusion criteria for potential participants in this study were wide. Due to ethical concerns, it was decided that everyone younger than 18 years old were excluded from the study. Another requirement was that the potential participants had basic computer literacy and owned a mobile phone. The reasoning for this exclusion criteria was based on the assumption that a basic level of digital competence was required for the participant to own any digital artefacts. To make sure the participants met the requirements, they were asked to fill out a questionnaire with questions about age. An extra question about digital literacy was included to see how digitally literate the participants perceived themselves to be. The final exclusion criteria were that the participants could not be anyone really closely related to the researcher. This was to try to avoid potential biases, where the answers of the participants could have been influenced by previous conversations and discussions with the researcher about the topic.

3.6 Conduction of interviews

The interviews were conducted one-on-one using the questions from the interview guide (Appendix A for the original Norwegian version, Appendix B for the English version). They were semi-structured, where it was possible to discuss topics brought up by the participants in more depth. The participants were allowed to choose the location of the interview, so it could be conducted where they were comfortable. Most of the interviews were conducted physically, but some of them were conducted digitally through Zoom. The locations ended up being a combination of at the participants' home, at the university campus and at hotel rooms.

Before the interview started, the participants were asked to fill out a consent-form where they consented to participating in the study. Some participants were also asked beforehand whether they wanted to bring their cherished artefacts to the interview, but most participants did not do this. A voice recorder was utilized to record the interviews, and the participants were asked whether they were comfortable with this. The participants were informed that they could cancel at any point if they no longer wanted to participate.

They could also skip questions if they were not comfortable with answering them. None of the participants ended up asking to skip any questions, but it was important for them to know that they could if they wanted to. Before the interview started, they were also encouraged to ask questions at any point if there was anything they did not understand or wanted clarification about.

3.6.1 Chosen data analysis

Through the combination of the research strategy and the data generation methods, it was decided that a qualitative approach to the analysis would be fitting. Qualitative analysis is a good fit with multimedia-content like interviews (Lazar et al., 2017), due to it being able to more deeply analyze the content than a quantitative analysis. Some quantitative methods can be utilized to create an overview of the data, but most of the analysis will be using qualitative methods.

In the data analysis, the interviews will be transcribed and coded using emergent coding. It is important to transcribe them to further anonymize the data, as it is essential that the participants are not recognizable in the end. To make this more efficient, the transcription tool in Microsoft Office was utilized. The tool is not perfect and sometimes struggle with different dialects, but after a control-transcription it ended up being very helpful and efficient. An emergent coding strategy was used to code and categorize the data. The codes were not defined beforehand and were created as the data was analyzed. Emergent coding was chosen, as it would require an existing framework or theory to utilize priori coding. I had some ideas of what the results might be after the literature review, but it was important to keep an open and objective mind when analyzing the data. There might be aspects or reasons I do not know about, which might be lost with a priori coding scheme. NVivo was utilized as a tool to assist with the coding. The data was analysed from an emic perspective, where it is analyzed from the perspective of someone within the culture.

The questionnaire was filled into a spreadsheet to better keep track of the data. Since the main objective of the questionnaire was to check whether the participants fulfill the inclusion-exclusion criteria of the study and gather demographic data, it was not analyzed to the same degree as the interviews. The data was mainly filled into graphs to see if there were anything which might require further exploration and analysis. If this were the case, it would be compared to the participants interviews and work as a triangulation of the data.

4 Analysis and findings

After the 16 participants had filled out the questionnaire and completed the interview, the data needed to be coded and analyzed to further solidify the findings. The findings have been separated into five chapters. The first chapter covers the simple demographic data and technological habits gathered in the questionnaire the participants were asked to fill out before the interview. The next four chapters are defined according to the research questions, where the first of the four chapters is the participants' relations to digital artefacts. The second chapter covers how the participants maintain their objects. In the third chapter, the participants' own thoughts on digital and physical objects are the main focus. In the fourth and final one, the participants were split into age groups. This was done to see whether people value things differently as they get older. Since all the interviews were conducted in Norwegian, all the quotes from the interviews in this thesis has been translated to English for better readability.

4.1 Questionnaire and demographic info

The questionnaire was created and included to check whether the participants fulfilled the inclusion-exclusion criteria, but it also provided some interesting information regarding their technological habits and how they think of themselves technologically.

4.1.1 Demographics

The questionnaire contained some simple questions about the demographics of the participants. These questions were asking the participants' gender and age. To anonymize the participants, they were not asked their exact age. Instead, they were asked to check a box matching their age group.

Age

To examine whether age had an impact on the relationship to and maintenance of physical and digital artefacts, it was decided that half of the sample would be younger than 30 years old and the other half would be older than 30 years old. Figure 4 shows the age distribution of all the participants in the study.

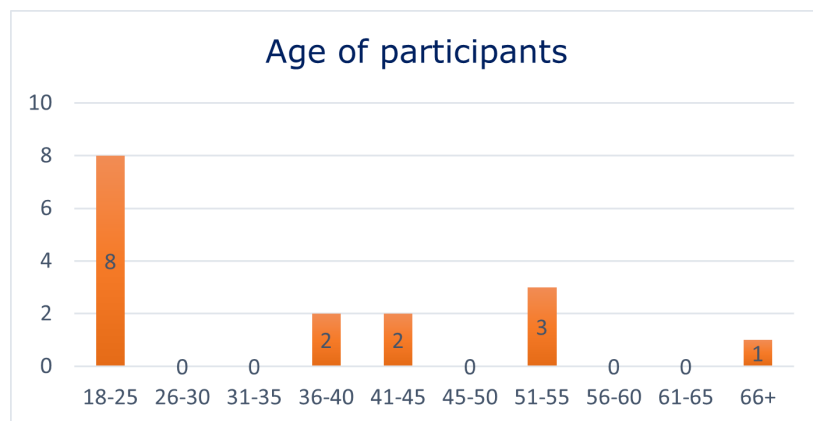


Figure 4: The age distribution of the sample, with the categories matching the choices in the questionnaire

In the age group of participants under 30 years old, all eight of them were in the sub-group aged 18-25. This means that the older part of the under-30-group in the age-span 26-30 were lacking participants. The participants in the over 30 years old age-group are a lot more evenly spread across the different age categories. Figure 4 shows that two of the participants were in the age group 36-40, two participants in the age group 41-45, three participants in the age group 51-55 and a single participant being 66+ years old. While more evenly distributed than the under 30 age group, it still is somewhat clustered into four out of the eight categories.

Gender

A sample which is demographically balanced requires a gender distribution that represents the larger population. In this case, the study had a 50% male and 50% female split of participants. Figure 5 shows the gender-distribution of the sample as eight males and eight out of a total of 16 participants.

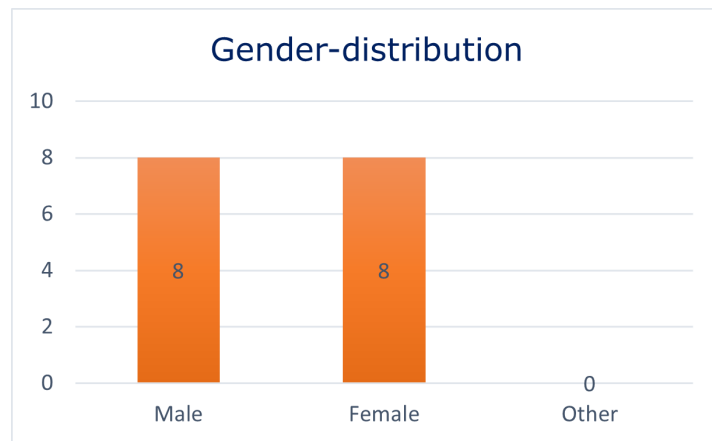


Figure 5: The gender distribution in the overall sample

Research question one, two and three are based on this even sample, but the fourth and final research question asks how the previous research questions are affected by age. Therefore, it is also important to look at the gender distribution in the age groups of participants over 30 years old and participants under 30 years old. Figure 6 displays this distribution sorted by age group. In this case the samples are not completely even, as there are five males and three females in the group under 30, and three males and five females in the group over 30.

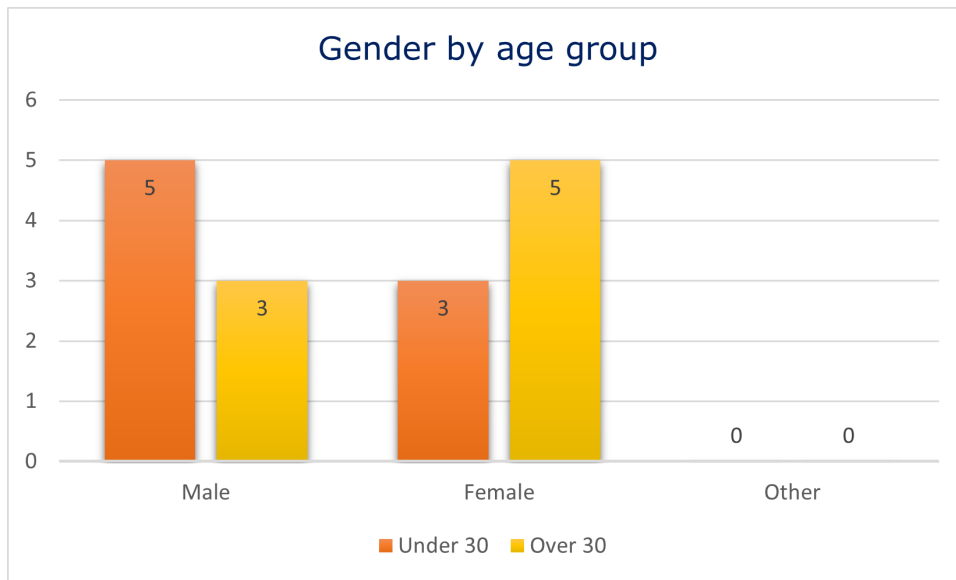


Figure 6: The gender distribution sorted by age group

The small unevenness may have an impact on the research question four about how age affects the previous research questions, due to the small size of the sample.

4.1.2 Technological habits

The questionnaire also asked a couple of questions relating to the participants' technological habits. This was important relating to the inclusion-exclusion criteria which required that the participants have a basic digital literacy. Therefore, the questionnaire asked whether the participants had a mobile phone and a computer, how often they used it, and what they used it for.

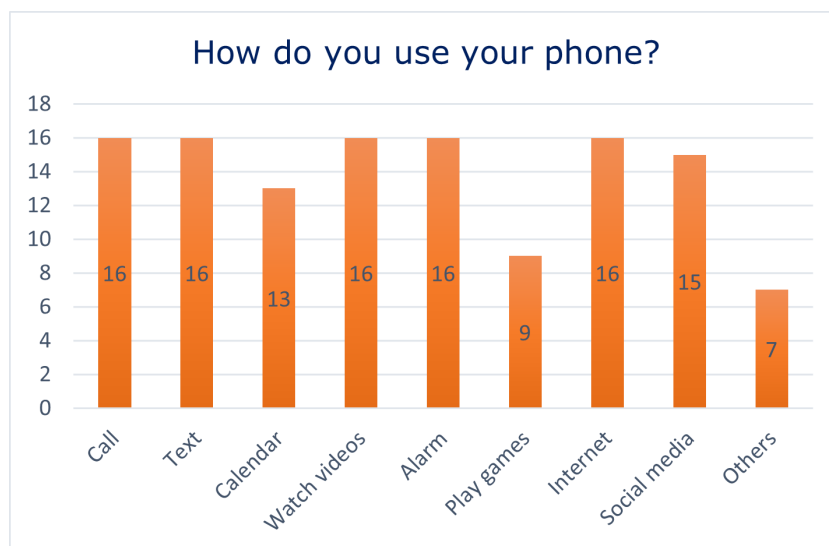


Figure 7: What the participants usually use their phone for

All 16 participants reported having a mobile phone and a computer, and described using both several times a day. Figure 7 shows the results when the participants were asked

how they use their phone. They were given a set of options and were allowed to place as many marks as they wanted to. Everyone reported using their phones for calling, texting, watching videos, alarms, and the Internet.

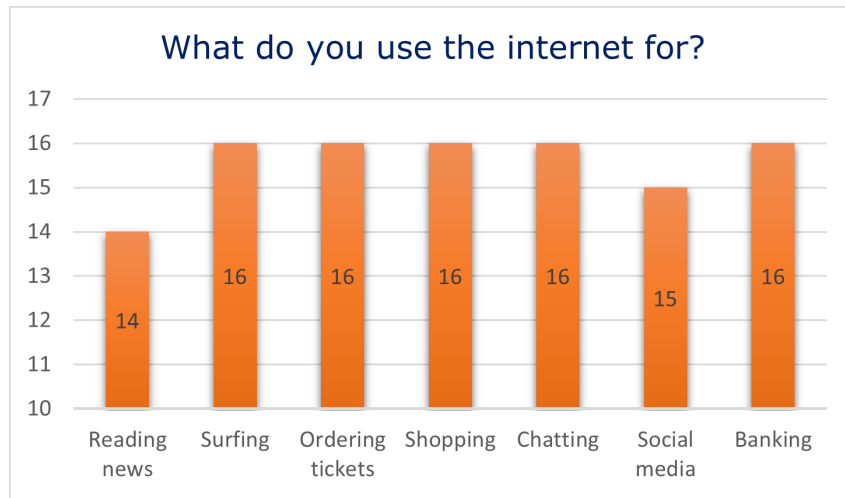


Figure 8: What the participants use the Internet for

Everyone also knows how to use the Internet and use it multiple times every day. Almost every participant uses the Internet for all the suggested activities. The only exceptions are reading news and social media as shown in Figure 8.

The most common location for computer usage was at work. Figure 9 shows that around half of the participants use their computer at university/school and at public places like cafés and restaurants. The statistic that around half of the participants actively uses their computer at school or university can be explained by the under 30 group mainly consisting of students.

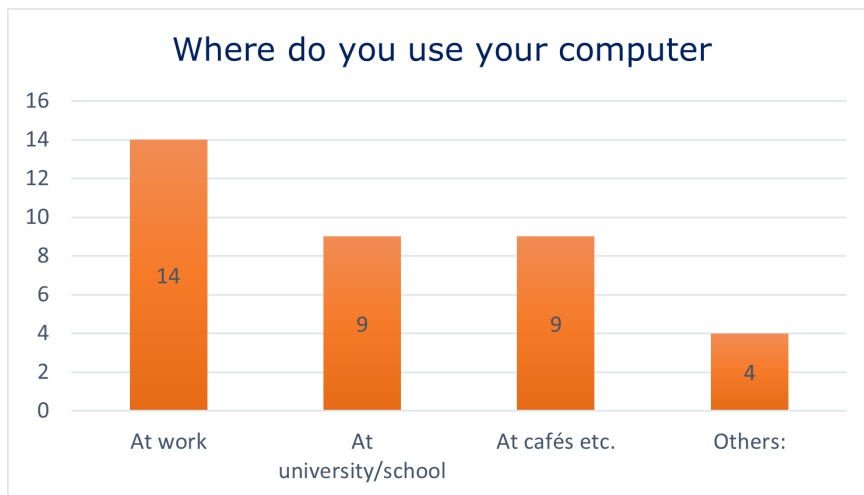


Figure 9: Where the participants usually use their computer

4.1.3 Self-perceived computer literacy

The final question of the questionnaire asked the participants to evaluate how computer-literate they think they are compared to the average citizen. Figure 10 shows that every participant considered themselves to have an average or better computer-literacy. The most common answer was above average technical literacy, but high and average technical literacy were only one participant lower. It is important to note that this is a self-evaluation and not a technical evaluation. This means that results depend on the participants' perception of their own skills and abilities.

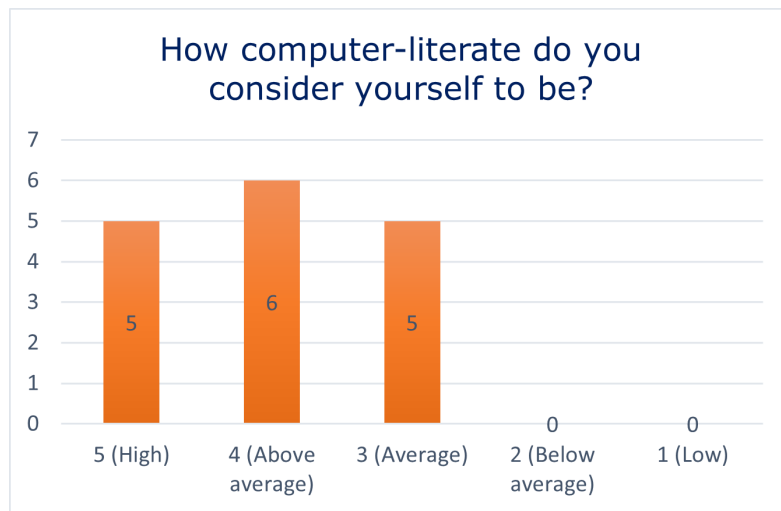


Figure 10: The participants' answers when asked to evaluate their own technical literacy

4.2 Relations to physical and digital artefacts

The methodology chosen to examine the participants' relations to physical and digital artefacts was to interview them on their relations to both. By discussing the physical first, it was possible to lay the foundation of what is important to the individual participant and why, before expanding on it by discussing the digital object afterwards. This allowed for a direct comparison between the two.

4.2.1 Coding

Since an emergent coding strategy had been chosen as the coding methodology, the codes were undefined before the analysis process began. The codes were defined as the transcriptions of the interviews were examined. During the coding process, several different categories of code were created. Discussions about the participants' digital and physical artefacts were separated during the interview, as this would make the comparison of the two easier. Within these two separate categories, the codes were again split into new categories. One category for codes describing what the object was, one category for codes describing the stories behind the objects, and one category for codes describing why the artefact was important to the individual participant.

Reasons for cherishing the artefact was the largest of the coding-categories, as all the different reasons the participants had for why their objects were important to them fell under this category. These codes were duplicated, such that both the physical and digital

had the exact same codes. Some of the codes ended up empty for either digital artefacts or physical artefacts, but it allowed for an easier comparison between the two.

After coding and re-coding the transcripts of the interviews, the reasons for why the participants cared for and cherished their objects were separated into seven codes. Table 1 defines the different codes used for distinguishing between the reasons why the artefacts had value to the participants.

Name of the code	Definition
Availability	Participants talking about the availability of the object making it more valuable to them.
Functionality	Participants point to the functionality of the item as a reason why it is important to them. It is about what the object allows the participant to do instead of the object itself being valuable.
Identity	Participants explicitly states that the object is, or has been, an important part of their identity in some way.
Positive Feelings	Participants discussing how the objects makes them feel special positive feelings
Sentimental or nostalgia	Participants discuss the object having emotional value to them due to it reminding them of a specific person or another point in time in their life.
Time or money invested	Participants describing all the time and money they have spent on the object and how all these resources spent has increased the value of the object.
Uniqueness	Participants discussing uniqueness and how their object being unique increases its value significantly.

Table 1: All the codes used for categorizing reasons why the participants cherish their objects

It is especially important to distinguish between the codes “Positive feelings” and “Sentimental or nostalgia” described in table 1. “Sentimental or nostalgia” refers to feelings where the participants are reminiscing and remembering something because of their valued artefact. This can be illustrated by a quote from one of the participants when describing why their first teddy bear means a lot to them, “It reminds me of my grandfather, my grandfather was nice”. In this quote they point to the teddy bear reminding them of their grandfather as a reason why it is valuable to them. This is an example of a quote which would fall under the code “Sentimental or nostalgia”. The code “Positive feelings” is supposed to cover situations where the feeling the object gives the participant is not a sentimental or nostalgic feeling. An example of this is when a participant describes how they feel when they wear their special pair of shoes, “Dress up a bit, right? Wear a fine pair of shoes”. In this case it is categorized as “Positive Feelings”, since the shoes makes the participant feel good about themselves.

The cherished artefacts the participants described as valuable to them were also categorized by which type of artefact it was. These categories were created by first analyzing the parts of the interviews where the participants shared their physical objects. The physical objects were then categorized and sorted. Afterwards, the same process was repeated with the digital artefacts, but they were placed into the categories created for the physical artefacts if they fit. Table 2 displays the different categories the physical and digital artefacts were sorted by and their definitions.

Type of artefact	Definition
Clothing	The participant’s cherished object is a piece of clothing or something that is usually worn
Equipment	The cherished item of the participant is a tool which allows them to do a certain activity
Hobby	The participant chose an item which does not necessarily have a function of its own, but is connected to a hobby they have had.
Mementos	Mementos are objects which are kept to help the participant remember a specific time in their life. It can also be preserved to help the participant remember certain events, places, or people.
Phone	The participant’s valued object is a phone
Places	The participant’s most valued object is a place instead of a specific object.
Nothing special	The participant mentioned that they either do not have any specially cherished items or cannot remember any. They may have remembered an object which is important to them at a later point in the interview, but it was not important enough to be remembered right away.
Other	Unique cherished objects which do not fit into the previous categories

Table 2: The definitions of the categories used to sort the cherished artefacts

The categories “Hobby” and “Equipment” are closely connected, as special objects that can be considered equipment for a hobby has been categorized as “Equipment” instead of as “Hobby”. Some examples of this are a bike or a sewing machine. Bicycling or sewing might be the participants’ hobby, but the object is a tool for the participant to do the activity. Objects categorized as “Hobby” are objects which are a result of the hobby. An example would be that the sewing machine is categorized as “Equipment”, while the shirt that was sown using the sewing machine would be considered “Hobby”.

In most situations, the phone can be considered a piece of equipment, but since it was one of the most common answers, it was decided that phones should have their own category. The phone has a specific role in this project, as it is a tool to access the digital while being a physical object itself. It could be defined as a hybrid artefact, hence why it was important to make phones its own category for later comparisons.

The “Nothing special” category was created since there were participants who could not think of an artefact which meant a lot to them when asked. The participants were given ample time to reflect and think about their cherished objects, but in these situations, it was decided that it was best to move on and return to the question later in the interview. The participants may or may not have thought of something when asked again later, but it is important to include these situations in the data as it may be relevant.

4.2.2 Physical artefacts

When asked to describe a physical object that means a lot to the participant, they gave a lot of different answers. In total, the 16 participants mentioned or described 20 different objects which means a lot to them. Figure 11 displays how the physical artefacts were

categorized. Every category is represented with the physical artefacts, where the largest ones were “Equipment” and “Mementos” with five objects. The rest of the objects were somewhat evenly distributed across the rest of the categories, with the category “Phone” and “Other” being the exception.

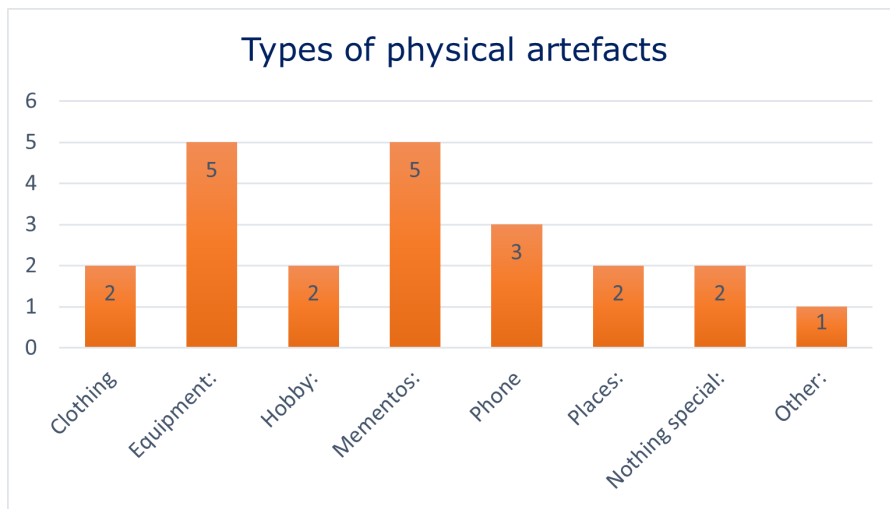


Figure 11: The distributions of cherished physical artefacts by category

When asked why their artefacts were important to them, there were plenty of reasons for why it was valuable. Figure 12 displays the distribution of reasoning for why the participants’ cherished physical artefacts were valuable to them. The most common reasons were that the item gave the participant sentimental or nostalgic feelings when they interacted with it. This was brought up by 13 of the 16 total participants. Following the category “Sentimental/Nostalgia” are the categories “Functionality”, “Positive feelings” and “Time/money invested”. “Functionality” was a category which often depended on the participants chosen cherished item. A phone was more often valued for its functionality compared to for example an old teddy bear.

As described previously, the category “Positive feelings” describes other feelings than sentimental or nostalgic feelings. Examples of these feelings provided by the participants were the feeling of freedom, feeling challenged or something feeling relaxed. The participants who brought up time or money invested in the item had often spent a significant amount of time or money saving for the object, or invested a lot of time into maintenance and upgrades of the item. These four categories stood out as the four most common ones, while the categories “Availability”, “Identity” and “Uniqueness” were less common. The three less common reasons for an artefact having a high personal value were often accompanied by at least one of the four more popular reasons. None of the participants pointed to them as the sole reason why the object was important to them.

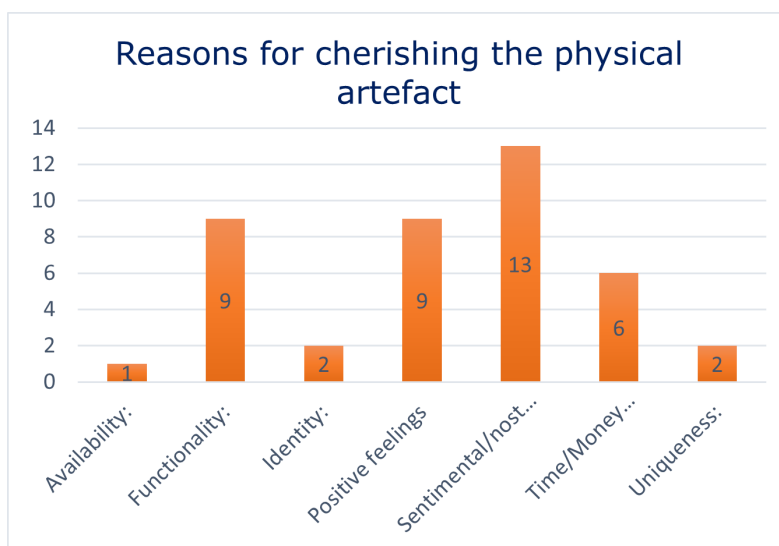


Figure 12: The distribution of reasons for why a physical artefact is valuable to the participant. One artefact may have multiple reasons

“Clothing” is the category for artefacts where the participants mentioned something they can wear as an important artefact to them. As a smaller category, there was not much diversity within it. Both the participants who mentioned a piece of clothing as a cherished item had similar reasoning. The first participant had a pair of shoes as their cherished item. It was the first expensive pair of shoes the participant bought with their own self-earned money. “I still have them, no matter how worn and dirty they are” was one of the quotes from the participant when asked whether they still had them. The shoes had sentimental value to the participant because it was the first pair they bought on their own. The other piece of clothing was a Norwegian bunad. A bunad is a traditional folk costume commonly used in Norway at different celebrations, like the national day 17th of May. Bunads are generally expensive, and the participant mentioned that they chose to spend their own money on one at a young age. Both participants also pointed to the functionality of their items as an important aspect of its value. “A bunad is something you wear at special occasions. When I wear it, it shows that I’m from a specific place in Norway”. Bunads have different designs depending on which part of Norway it is from, and the participant said that this makes it an important part of their identity. Especially because they no longer live where the design of the bunad originated from.

“Equipment” was one of the largest categories of cherished artefacts, as shown in figure 11. In table 2, equipment is defined as a tool which allows the participant to do a certain activity. Examples of physical object mentioned by participants were their workout equipment, their sewing machine, and their old car. The most common reason for why the objects were important for the participants was their functionality. “It feels good to just go outside, get in a car and travel somewhere” was said by one of the participants when explaining why their old car was important to them. In this quote the participant also mentioned something closely connected to the artefact’s functionality and the feeling of using the object. Several of the participants associated positive feelings with interacting with their cherished object. The equipment category was the only category where participants mentioned uniqueness as a reason for why their object was important. Both the participants who mentioned uniqueness during the interview explained how once you use a physical object you get to know it in a special way. You know about every little imperfection it has, which is unique to that exact object. Even if it is replaced by the

exact same model and brand, it will not be the same. Sentimental or nostalgic feelings were also common, especially with the older equipment. They had elaborate stories about how the object was acquired or how it reminded them of another time in their life.

The artefacts in the “Hobby” category are, as with the “Equipment” category, closely related to functionality. The main difference between the two is that the “Hobby” category has a larger emphasis on positive feelings over functionality. For example, the participant who described the minifigures they painted said “There’s a lot of work put into them when you think about it, but that is what I find fun”. Here, they talk about the fun of painting the figures and how the time the participant invested into them makes them valuable. Both participants mentioned sentimental or nostalgic feelings as an important aspect of why the object was valuable to them. When describing a LP record as an important physical artefact, the participant mentioned that the fact that it was a gift from a loved family member made it even more valuable. The combination of it being a gift from a loved one and it being a LP record from a band they enjoyed was why it was especially important to them.

Artefacts in the “Mementos” category were all closely tied to sentimental or nostalgic feelings. By the definition in table 2, mementos are objects kept to remember something important. Every participant who described a memento pointed to these sentimental or nostalgic feelings as the reason why they kept them. When asked why their old teddy bear was important to them, one of the participants answered: “When I was young, I kind of had my own friend in the teddy bear. He has been a good friend throughout my entire upbringing. It also reminds me of my grandfather”. Figure 13 shows one of the participants’ cherished teddy bear. The object was important because of their shared history and that the participant received it from someone important to them. These were the two main reasons why they treasured the objects. Some mentioned that the objects helped them remember important events or people, who would fade from their memory otherwise.

The participants who chose to talk about their phone as their most cherished object all focused on the things it allowed them to do. They talked about how they would feel lost without their phone, and how it was important to them to stay in touch with people. The physical phone itself was not that important, as long as they had some familiarity with it. “The phone means a lot, not necessarily because I care a lot about it. But it is very handy though, very convenient”. The quote points out that the functionality of the phone is the main thing which makes it valuable. There were some cases where the phone had some value outside of its functional usage. One participant mentioned the phone being a gift from their parent as something which gave it a little bit of additional value. “I don’t feel super sentimental value for it (the phone). I got it from my mom and dad, so in a way... Maybe a little?”



Figure 13: A cherished teddy bear owned by one of the participants (*Self-captured image*)

Some of the participants thought of cherished objects on a larger scale than the other participants when asked about their valued physical objects. Unlike the other participants, they chose a specific location as their most valuable object. Hence why the “Places” category was made. Both of the participants who mentioned a place as their most valuable object mentioned their cabins. The positive feelings a cabin provided was the main reason why it was so valuable to them. “It’s a sanctuary where I can disconnect from reality for a while” said one of the participants when asked why their cabin was important to them. Both cabins had a long history in the respective families, which increased the sentimental value of the places and buildings. The cabins were not defined by the building itself; the entire area was important. This means that if the house was moved somewhere else, it would not be the same. One of the participants mentioned that there had been put a lot of work into the cabin, which also increases its personal value.

The “Other” category was made for artefacts which did not fit into any of the other categories. When it comes to physical objects, the only object in the category was one of the participants’ significant other. They mentioned that the person themselves were the most valuable thing in their life, this mainly due to functionality and positive feelings of love.

“Nothing Special” categorizes situations where the participants could not think of anything when asked about their valued physical artefacts. This was included, since it meant that

they did not have anything that was important enough for them to think of right away. When discussing physical artefacts, both of the participants who could not come up with any cherished physical artefacts did so before the end of the interview.

4.2.3 Digital artefacts

Compared to the physical artefacts, the types of digital artefacts were a lot more lopsided. Figure 14 displays the distribution of the participants' cherished digital artifacts. "Mementos" was the most common category with 13 responses. Two of the responses came from the same participant. This meant that 12/16 participants cherished a digital artifact which could be categorized as a memento. "Phone" was the second most popular category, with 3/16 participants thinking of their phone as one of their most cherished digital artefacts. When talking about phones, it is important to distinguish between the physical phone and the digital content on the phone. The participants who responded with their phone were mainly thinking about the digital content on their phone when asked to clarify what they meant by their phone being a cherished digital artefact. None of the participants chose to talk about anything which could be categorized as clothing, equipment, or places.

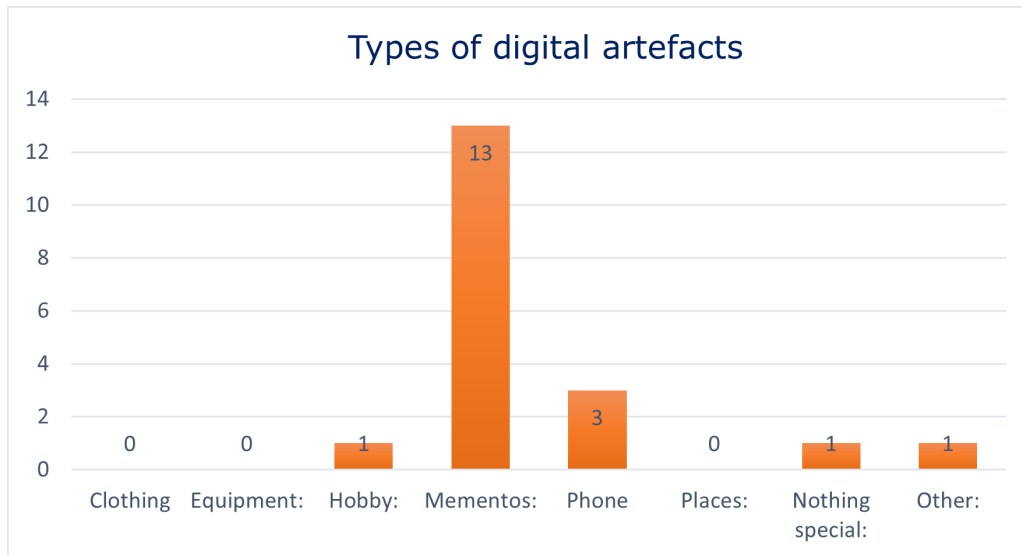


Figure 14: The distributions of digital cherished artefacts by category

Since the "Memento"-category is the most common one by quite a large margin, it makes sense that the reasons the participants had for cherishing the artefacts were rather one-sided as well. Figure 15 displays the different reasons participants had for cherishing their digital artefacts. Sentimental or nostalgic feelings were the most popular reason for why the digital artefacts were valuable to the participant. The functionality of the artefact was the second most popular reason, with for example a participant saying this when talking about a multiplayer game which meant a lot to them: "It's about the interactions, and what we can achieve together." In this quote, the participant points to the social interaction the game allows the players to have with each other. For some participants, the time or money invested in the digital artefact was one of the reasons why it was valuable to them. When talking about why the multiplayer game was valuable to the participant, they pointed out that they have spent a lot of time in the game to progress and build up their save file.

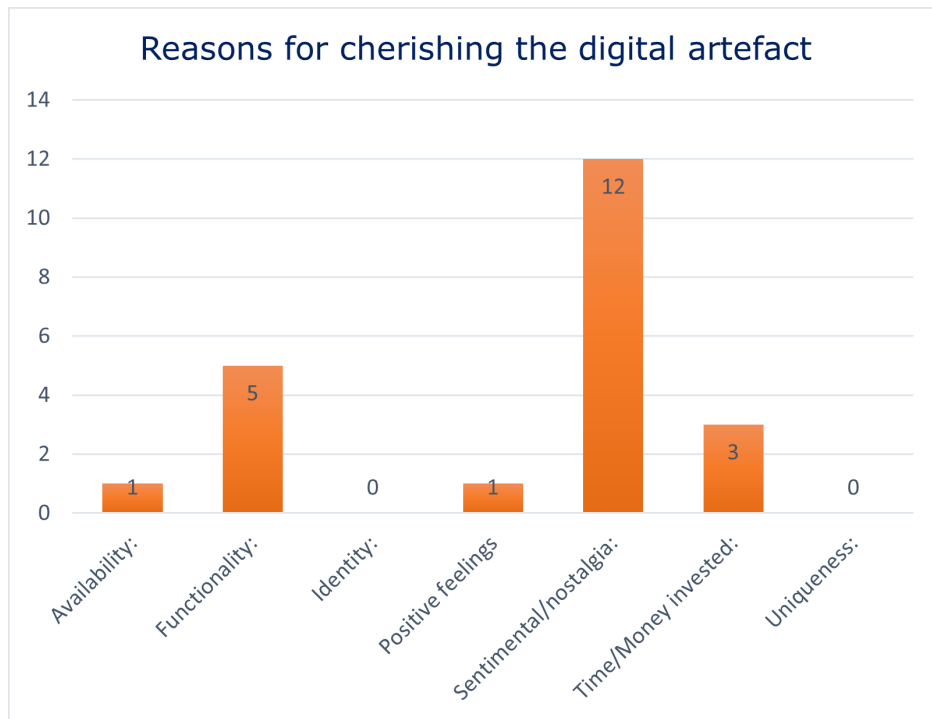


Figure 15: The distribution of reasons for why a digital artefact is valuable to the participant. One artefact may have multiple reasons for being cherished

Only one participant mentioned a digital artefact which fit in the “Hobby” category. The participant described a mobile game as something that means a lot to them. The game is a multiplayer game about cooperation and city-building, where you have to work together with other players to achieve your goals. The social aspects of the game were the most important to the participant. The functionality of the game and the time invested in it were the main reasons why it was valuable to the participant.

“Mementos” was the most common category when the participants were asked about their cherished digital artefacts. Out of the 13 mementos seen in Figure 14, 11 of them were in some way related to digital images. Some participants chose to focus on one specific image, while others referred to their entire collection of digital images as their most valuable digital artefact. When asked about their digital artefacts, one of the participants said:

“It has to be images and videos. I take some photos and such, and maybe even more after I got kids and so they mean a lot. They are things that are fun to look back on, especially once a few years have passed”

Participants described nostalgic feelings as the main reason why the digital images were important to them. When asked why their digital images were important, one participant answered: “It might be that you remember things better when you sit and scroll through. What you did on a trip for example, small details that you might forget if you don’t look at pictures”. Some of the participants mentioned that the time they had invested into taking all those images were an important reason of why they were important as well.

Even though digital images were the most common answer when the participants were asked about their digital artefacts, it was not the only answer which could be categorized as a memento. One of the participants explained that their written works mean a lot

to them. They explained that they spent a lot of time writing and editing them, and it represents some of their biggest achievements in their career. It is something they are proud of. The other digital artefact a participant presented as an important to them was a save file for the Gameboy Advance game *Pokémon Ruby* (Game Freak, 2002). It was a save file they created when they were younger. The save file is stored on an old game cartridge shown in Figure 16. It is mostly valuable to the participant due to the nostalgic feelings connected to the game. “It is very cool to just go in and take a look. This was started 15 years ago. It is cool to see what 8-, 9- or 10-year-old me were doing”, answered the participant when asked why the save file was important to them. The functionality of the game was also important, as it was their first experience with a game world. When asked what the participant thought was the reason for why it was so important to them, they answered: “I think it is nostalgia, but it was also my first meeting with a game world. That is where it started”. By “it”, the participant is referring to their interest in fictional game worlds and experiences, which has shaped their entire upbringing.



Figure 16: An old *Pokémon Ruby* (Game Freak, 2002) cartridge with an old save file (*Self-captured image*)

When asked about digital artefacts which meant a lot to people, their phone was the second most common artefact brought up. “The first thing I can think of is my phone” said one of the participants as soon as they were asked about digital artefacts. Another one said: “It is my phone. It is my entire world”. Upon further questioning, all three of the participants pointed to the content and the functionality of the phone as the reason why it was valuable to them. The phone is a tool to take pictures, send messages and store other information. When asked about what makes their phone special to them, one of the participants answered: “It is the content of the phone, what you can do with the phone”.

The “Other” category includes items which does not necessarily fit under any of the other categories. When asked about a digital artefact which meant a lot to them, one of the participants answered that the digital contact information of all their friends and family mattered a lot to them. They had different contact info saved on both their phone, their computer, and on social media, which meant that it did not fit in the phone category. The participant said that they would feel isolated if they lost their contacts. The functionality

of the contacts was what made them valuable to the participant.

“Nothing Special” was the category for participants who could not think of anything specific when asked about their valuable digital artefacts. One out of the 16 participants described not having any digital artifacts that were precious to them. When asked about his relations to digital artefacts compared to physical artefacts, the participant said: “Things cannot define who you are, and I have never had that kind of attachment to a digital object”.

4.2.4 Similarities and differences between physical and digital artefacts

By examining the participants’ relations to their respective physical and digital artefacts, it was possible to gather information on how this differs. There were some pretty large differences when it comes to what types of artefacts were valuable, but they have some similar elements.

The distribution of cherished artefacts differed between physical and digital artefacts. As shown in Figure 17, the physical artefacts were more evenly distributed between categories compared to the digital artefacts. This comes from the digital artefacts having less variance than the physical ones. Out of the 19 digital artefacts described by the 16 participants, 11 of them were digital images. Because of the lack of variation in artefacts, there were limitations to which categories the items could fit in. The digital artefacts were restrained to categories which can be seen as more relatable to the digital world. There exists examples of digital clothes, equipment, and places, but none of them were as valuable as their real-world counterparts.

The phone was a reoccurring object in both the digital and the physical. As a tool for accessing digital data, the phone works as a physical gateway into the digital world. The functionality of the phone was what made it valuable to the participants. The phone was an area where the participants struggled to separate the digital from the physical. The phone itself was physical, and it makes the participants’ digital artefacts appear physical.

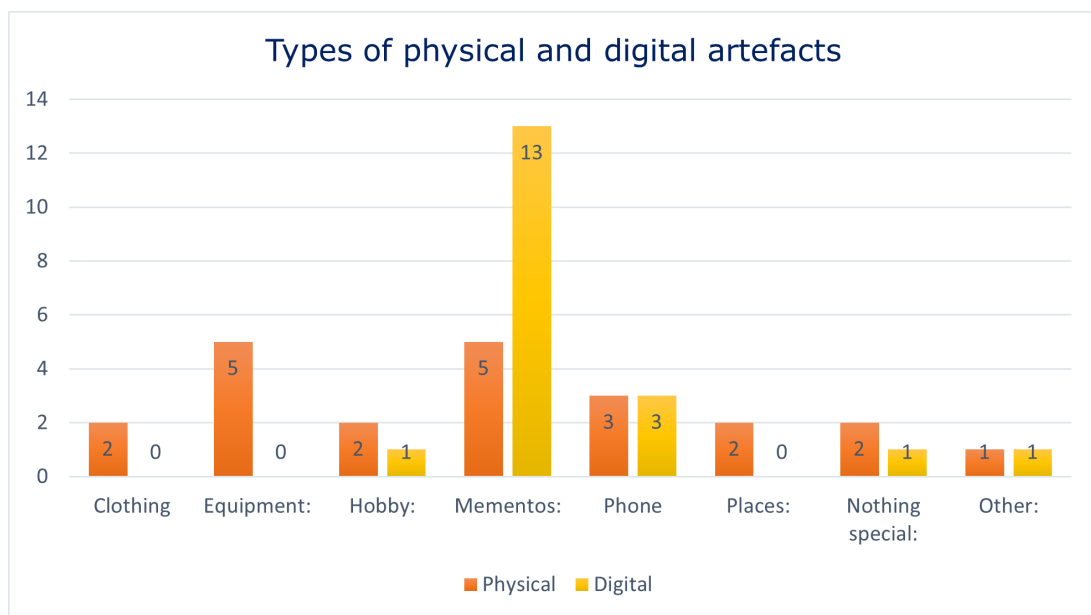


Figure 17: Comparison between the physical and digital artefacts of the participants

It is interesting to note that there were more replies in the “Nothing special” category for physical artefacts, but both participants ended up with describing a physical artefact which means a lot to them later in the interview. Every participant had a physical artefact that had some significant value. This was not the case with the digital artefacts, as there was one participant who did not have any digital artefacts which meant a lot to them.

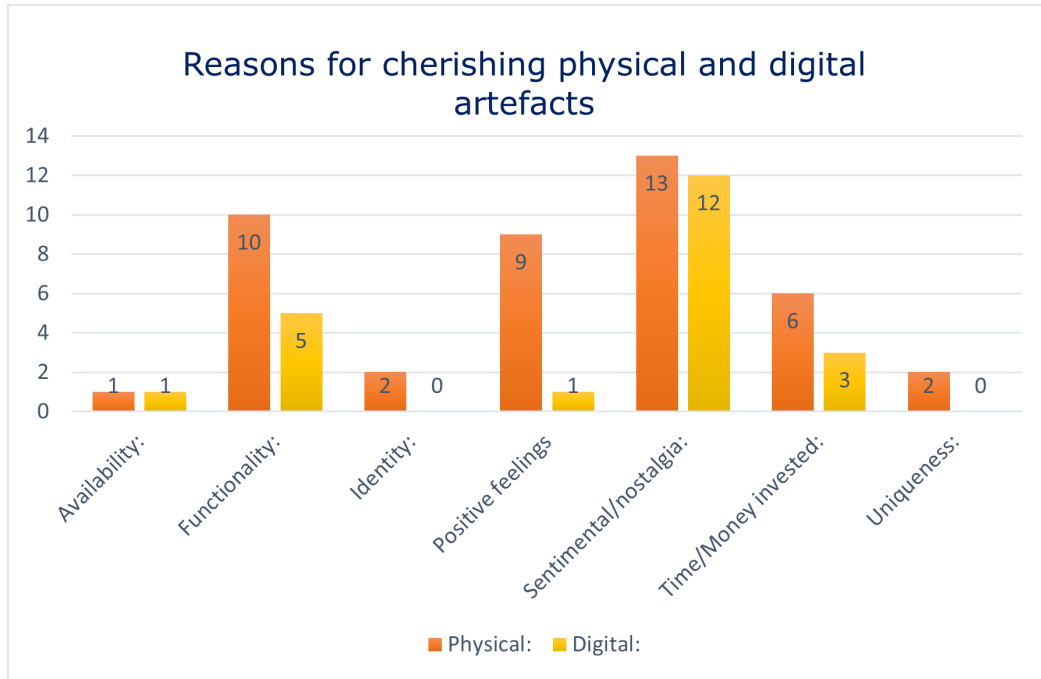


Figure 18: Comparison of the reasons why physical and digital artefacts are valuable to the participants

The types of cherished artefacts affect the reasons why they are cherished. Figure 18 compares the reasons for why the participants gave for cherishing their object. It shows that some of the reasons, like functionality, positive feelings, and time or money invested, are a lot more prevalent in physical artefacts.

The category “Sentimental/Nostalgia” was the category where the participants’ given reasons were the most similar. Almost every participant mentioned sentimental or nostalgic feelings as a reason why an artefact was important to them. Whether it was a physical or a digital artefact, these types of feeling were important to the participant. Nostalgic feelings were more common than sentimental feelings, especially in the digital artefacts. Most of the digital artefacts were digital images, which were kept to help the participant remember something important to them. Some of them could be categorized as sentimental images as well, as they situationally displayed people or animals who were no longer alive. There were a couple of participants who discussed their physical images as well, which had the same sentimental or nostalgic reasons for being valuable as their digital counterparts.

The “Positive feelings” category was the category with the largest difference between physical and digital artefacts. While the category “Sentimental/nostalgia” also describes the artefact causing some sort of special feeling in the participant, the “Positive feelings” category is supposed to cover the feelings which were not sentimental or nostalgic. The participants reported a much narrower scope of feelings when discussing their digital artefacts compared to their physical ones. None of the participants talked about how their digital artefacts made them feel challenged or good in the same way as they did when

describing their physical artefacts.

The functionality of the artefacts was more important for the physical artefacts the participants shared than the digital artefacts. They cherished them because they allowed them to do something they love, instead of what the item was in itself. This mentality was present in some of the digital artefacts as well, but significantly less common. The functionality was often brought up when participants talked about the importance of their phone as a digital artefact.

Both the physical and digital artefacts had situations where their value to the participant increased due to the amount of time or money they had spent on it. While more common in the physical artefacts, there was a difference between the physical and digital artefacts in how the participants had invested in them. Some of the participants mentioned having spent a large amount of money on a physical artefact, thus increasing its personal value. This was not the case with the digital artefacts. None of the three participants who discussed their investment in digital artefacts mentioned money as a reason why it was valuable to them. All three of them talked about the time they had invested into the artefact instead. There were also some participants who had invested a significant amount of time into their physical artefacts as well and increased its personal value that way, but the money was the main reason for most of them.

Very few of the participants mentioned directly that the artefact was an important part of their identity, but those who did so only did so when talking about their physical artefacts. Those who mentioned artefacts being important due to their identity focused on it representing a part of who they are or were. None of the participants pointed to a digital artefact as being important for their identity. While identity was an uncommon reason for both types of artefacts, the results suggests that physical artefacts may be more important for identity than digital artefacts.

Uniqueness is something which is a problem in the digital world. Everything can be copied as many times as you want with little effort. Uniqueness was not something the participants brought up much when discussing why their physical artefacts were important to them, but a few of them mentioned it. They thought of their physical artefacts as nonreplaceable, even if it was replaced with the exact same brand and model. For some of the physical artefacts, the participants said that it did not matter if the item itself was replaced. This was more common with objects in the “Equipment” or “Phone” category.

4.3 Maintenance of physical and digital artefacts

To gain a deeper understanding of how the participants take care of and maintain their digital and physical artefacts, it is important to look at the different objects the participants cherish. Different types of artefacts require different types of maintenance, and the amount of effort people put into maintenance of their cherished artefacts depends on the person. Some put a lot of effort into maintenance, while others not so much.

4.3.1 Coding

When coding the data related to maintenance, they were separated into maintenance of physical artefacts and digital artefacts. This way it would be possible to isolate how every single participant maintained their artefacts, then compare digital to physical on an individual level. The data from every single participant’s digital and physical artefacts

were then summarized and put into a table to be compared with each other. The differences were then noted, and the participant was assigned a leaning depending on whether they put more effort into maintaining their physical or digital artefact. Table 3 defines the categories for how much effort the participants put into maintaining their physical or digital artefacts compared to the other.

Leaning:	Definition
Physical	Participants put in a higher amount of effort into maintaining their physical artefacts than their digital artefacts
Equal	Participants put in close to or equal the amount of effort into maintaining their physical and digital objects
Digital	Participants put in a higher amount of effort into maintaining their digital artefacts than their physical artefacts

Table 3: The categories used to categorize the difference in effort put into maintaining the participants artefacts

These categories were made to help gain an overview of the responses. The individual ways and level of maintenance were still the most important elements of the data. These elements were then compared to the different artefacts the participants cherished, to see whether there could be a possible correlation between the type of cherished artefact and the level of maintenance. The different categories for the objects can be seen in table 2 in section 4.2.1.

4.3.2 Physical maintenance

The maintenance of the different physical artefacts the participants cherished depended greatly on the type of object they described. Participants who chose an item categorized as “Equipment” put in general more time and effort into maintaining their physical artefact than participants who cherished physical artefacts in other categories. Like the participant who spoke of their sewing machine as a cherished physical artefact put a lot of effort into maintaining their object. They described doing technical maintenance on the object every once in a while to make sure that it is usable and well-functioning. They also kept it under a protective cover out of the way to make sure that it does not get knocked over or collect dust. Another participant who talked about an old car of theirs as a cherished object, put extensive work and effort into the car to make sure that it was functional and in good shape. As sort of a sub-category of equipment, the participants who described their phones as a cherished physical object also put some effort into maintenance. For example, cleaning over the screen once dirty and keeping it well charged. Everyone who mentioned their phones used a cover to keep it protected from falls as well.

On the opposite side of the scale from the participants with cherished equipment, were the participants who had cherished physical artefacts categorized as “Mementos”. In general, they put little to no effort into maintenance of the objects. They mostly let the artefact sit on a shelf or somewhere else and occasionally dust it off while doing house cleaning. When a participant was asked if they ever clean the old physical photo albums they described as a cherished object, they answered: “I’m not so good at that, maybe on the shelf around, but yeah”.

The participants who had valuable physical artefacts in the “Clothing” and “Hobby” category had a more diverse effort put into the maintenance of the object. In the clothing

category, both participants had at some point put a lot of effort into maintenance of the clothing. One of the two participants still did, but the other had reduced the amount of effort as the amount of wear on the object increased. When asked about the maintenance of their shoes, the participant answered:

“I was previously very good at cleaning them, watching out for them and make sure I do things right. But now I’ve had them for eight years, and now I just leave them on the shelf. They aren’t taken as much care of as they should, but I’ve planned to take them to dry cleaning sometime. Should definitely have taken better care of them”

Both participants who had artefacts categorized in the “Hobby” category mostly focused on putting the objects away once they were done with them. This included putting an LP record back into its cover after use or keeping the painted mini figures in a locked drawer where the participant’s kids cannot reach them. Neither of the participants mentioned doing anything else to maintain the cherished objects.

The “Places” category is a bit special, as the effort required to maintain the physical artefacts in the category are on another level compared to the other physical artefacts. Both of the participants who mentioned their cabins as their most valued physical object, said that they put quite a lot of time and effort into maintaining them. One participant said that they made sure to spend a lot of time there to make sure that it was in good shape, while the other mentioned painting and changing old parts to make sure it does not decay.

4.3.3 Digital maintenance

The small variance in the types of digital artefacts presented by the participants compared to physical artefacts means there is less variance in the different ways participants maintained their artefacts as well. Despite this, there was a large variance in how much effort the participants put into maintenance of their object.

The phone category is similar when it comes to digital artefacts as with physical ones, but the major difference is that the participants often maintained the phone itself, rather than the digital content of the phone. The main way the participants maintained the digital elements of their phones was through back-ups, either by using cloud-services or by saving the data on another device as well.

In the “Memento” category a large part of the digital artefacts were digital images. There was a varying degree of effort put into taking care of and protecting these images amongst the participants. On one hand, you had the participants who kept several back-ups of their images. On the other hand, you had the participant who had no back-up of their images at all. The most common way of taking care of the images was to have some sort of copy of the image saved in a separate location. This back-up could either be something like a physical hard-drive or a cloud service like iCloud or Dropbox. This means that the participants would not lose anything if one of their devices break. Some participants even used a combination of these tools, with both a cloud service and a physical hard drive. The written works, which one of the participants consider to be important to them were available online. For this reason, they did not put any effort into maintaining it, as it would always be available for download should they lose their own digital copy. The final digital artefact in the “Memento” category is the game save on a physical cartridge. In

this case the owner said that they did not put any effort into maintaining it, due to their idea that digital things are eternal in a way. The participant said that they trusted the digital artefact to be there and intact the next time they would want to interact with it.

The one participant who had a cherished digital artefact in the “Hobby” category was a surprising case. The digital artefact was an account for an online mobile game. The account the participant had in the multiplayer-game was connected to a personal e-mail and required a personal password to be accessed. The game has a “remember me” functionality where it remembers the device, so that you do not have to log in every time you start the game. In this case, the participant did not really know which e-mail the account was connected to. The participant did not remember the password for the account either. This means that should the participant be logged out of the game on their digital device for some reason, they will not be able to get back in. Usually, it would be possible to request a new password if the password for the account has been forgotten, but that requires access to the e-mail address of the account. This means that should the participant get logged out, the content will effectively be lost unless they manage to get some help from the customer support.

4.3.4 Similarities and differences between physical and digital maintenance

So far it has been established that different types of objects often receive different amounts of maintenance. This is important to take into consideration when comparing how the participants maintain their physical and digital artefacts. To make it easier to gain an overview of the difference in effort put in by the participants, they were put into the graph in Figure 19. The figure shows that seven out of the 16 total participants put more effort into maintaining their physical artefacts over their digital one. Another five out of the 16 participants put close to equal or equal amounts of effort into maintaining both their physical and digital artefacts. The remaining four participants put more effort into maintaining their digital artefacts compared to their physical ones. This comparison does not say anything about the amount of effort put into maintaining their artefacts. A participant could put zero effort in to maintain their physical artefact, but if they also put zero effort into their digital artefact they would be categorized as equal.

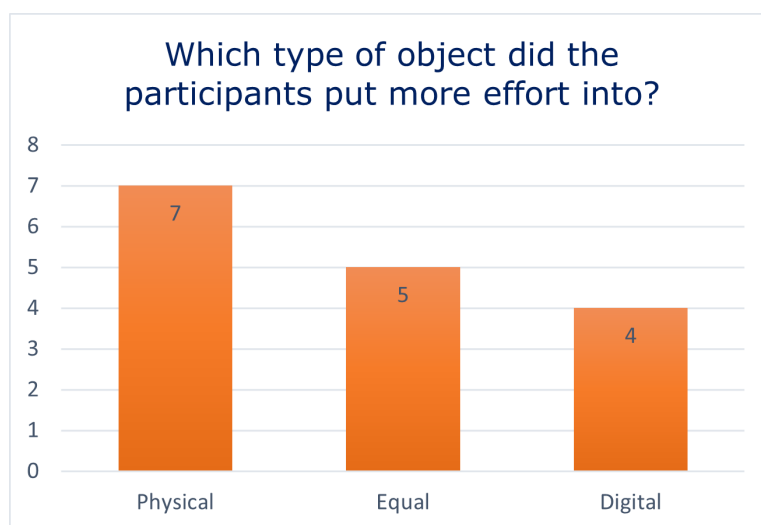


Figure 19: Which of their personal artefact the participants put the most effort into maintaining

An example of a participant who put in equal amounts of effort into maintaining their artefacts was a participant who had their mobile phone as their cherished physical artefact and their digital images as their cherished digital artefact. To maintain their phone, they used a protective cover to prevent it from getting damaged if it fell on the floor. They made sure to keep it well charged and clean, by cleaning over the screen with a cloth when it got dirty. To maintain the participant's digital images, they use a cloud storage service to make sure they have a back-up of their images. They also keep their most important files on a separate computer, meaning that they will not lose them should something happen.

Several of the other participants who were categorized as putting equal amounts of effort did so because they put small amounts of effort into maintaining both of their cherished artefacts. One of the participants said that they used cloud storage to maintain their digital images, but admitted that there was no system in the files, so it was hard to gain an overview of everything. Things were often just put on the cloud service and forgotten for a while. Not every participant categorized as equal put little effort into their cherished artefacts. There were some participants who put a moderate amount of effort into the maintenance of both their digital and physical artefacts.

The participants who put more effort into maintaining their physical artefacts were often participants who had an artefact in the "Equipment" or "Phone" category. For their digital artefacts they might use a cloud service or hard drive as back-up, but several of them did not have any back-ups of their digital artefacts. By using their physical objects often, they were more actively maintained than the artefacts they rarely interacted with. Due to the digital artefacts often being stored out of sight, some participants said that they sometimes forgot they even had them. Both of the participants who answered their cabin as their cherished physical object ended up in this category due to the large amount of effort required to take care of a vacation home compared to a digital artefact like a collection of images. They both used external hard drives to save their digital artefacts, but not much more than that.

The least common of the three categories were the participants who put more effort into maintaining their digital artefacts compared to their physical ones. They were the ones who put the most effort into maintaining their digital artefacts, often having several different cloud services, a combination of physical and digital back-ups or went through extra steps to keep them safe. One of the participants in this category kept a hard drive at a separate location, which was updated about every six months. This was to ensure that the data would not be lost should their house burn down or get destroyed in some other way. These participants did not necessarily put little effort into maintaining their physical artefacts, they just put that much more effort into maintaining their digital ones.

Several participants preferred to use physical disks to maintain their digital files. One of the participants mentioned having considered cloud services due to the availability of the files compared to a physical hard drive, but they did not want to pay a subscription fee every year for it. They said that they preferred a physical hard drive since it only costs money when you buy it, and preferred a one-time fee of the hard drive over continuous expenses of a cloud service. Some of the participants also mentioned that they would prefer to print out their digital images and store them physically instead. This hints at there generally being a preference towards physical objects.

4.4 Participants' thoughts on physical versus digital

Compared to the two previous research questions, this research question depended entirely on the participants' thoughts on the physical versus the digital. By asking the participants this, I was able to gain an insight into what aspects of cherished artefacts they considered the most important. It would then be possible to analyze how the participants think about digital and physical artefacts in general, without being limited by a specific artefact.

4.4.1 Coding

The interview transcriptions where the participants shared their thoughts about the difference between digital and physical things were coded in their own separate category. This way their answers would not be affected by their individual personal artefacts. These artefacts were taken into consideration later in the analysis, as the participants may have included some relevant ideas while sharing their physical and digital artefacts.

By asking the participants about their opinion on the difference between digital and physical artefacts, the participants' personal views were on full display. They provided their personal stance on the topic, which could then be categorized and sorted to gain an overview. The participants were therefore categorized into categories depending on their views on digital and physical artefacts. Table 4 displays the different categories and their definitions.

Personal leaning	Definition
Heavy leaning towards physical	The participant sees physical objects as superior in every way. Maybe even denouncing digital objects.
Leaning towards physical	The participant has a clear preference towards physical objects, but agree that digital objects may have value.
Slight leaning towards physical	The participant think of physical and digital objects as almost equal, but think physical objects have some elements that makes them superior.
Equal leaning	The participant think that physical and digital objects are equal or close to equal when it comes to value
Slight leaning towards digital	The participant think of physical and digital objects as almost equal, but think digital objects have some elements that makes them superior.
Leaning towards digital	The participant has a clear preference towards digital objects, but agree that physical objects may have value.
Heavy leaning towards digital	The participant sees digital objects as superior in every way. Maybe even denouncing physical objects.

Table 4: The different leanings the participants had when it comes to the value of physical and digital artefacts

While coding the interviews, the participants' statements were categorized by topic. The

different participants brought up a diverse range of reasons why they thought physical and digital artefacts were similar, or why they thought they were completely different. These statements were both for more specific properties, or for physical and digital artefacts in general. These reasons were categorized as different codes. Table 5 shows the different codes used to categorize the topics discussed by the participants.

The content of every code was then set up against each other in a Venn diagram to compare the physical and digital to each other. The number of participants who brought up each topic was also noted, as it was assumed that the more popular topics might be the more important ones.

Code	Definition
Accessibility	Participants discuss the similarities and difference in accessibility when it comes to digital and physical artefacts.
Effort	Participants talk about the difference in effort needed to maintain physical and digital artefacts.
Fear of loss	Participants discuss differences in losing digital and physical objects.
Fleetingness	Participants talk about fleetingness in the physical and digital world.
Functionality	Participants discuss the functionality of digital and physical objects.
Material Properties	Participants talk about the importance of materiality and how this differs between physical and digital artefacts.
Ownership	Participants discuss issues with ownership in digital and physical objects.
Sentimental value	Participants compare the sentimental value of physical and digital artefacts.
Status	Participants talk about how status is affected by physical and digital objects.
Uniqueness	Participants discuss the issues with uniqueness in digital artefacts and how this makes them different from physical artefacts.

Table 5: The different codes used to analyze the participants’ thoughts on digital artefacts versus physical artefacts

4.4.2 Perceived similarities and differences between the digital and the physical

There was a clear leaning towards the physical throughout the entire analysis, as none of the participants had a view that favored digital artefacts over physical. Figure 20 displays how the participants viewed the value of the physical versus the digital.

Figure 20 shows that eight of the 16 participants were categorized as leaning towards the physical. These participants did not think that digital artefacts could not have any personal or material value, but they thought that physical artefacts had some elements which made them superior to digital artefacts. Four of the participants were categorized as thinking of digital and physical artefacts as equal. They acknowledged that they have different strengths and weaknesses, but they still had the same personal value. Two of the participants had a clear leaning towards physical. These participants got the code “Heavy leaning towards physical” due to them actively speaking against digital artefacts,

and had few positive things to say about them. During the interview they mentioned either directly or indirectly that they wished there were fewer digital things in our society. The final two participants were coded with a slight leaning due to them acknowledging physical and digital artefacts as equals, but still preferred physical artefacts due to some elements.

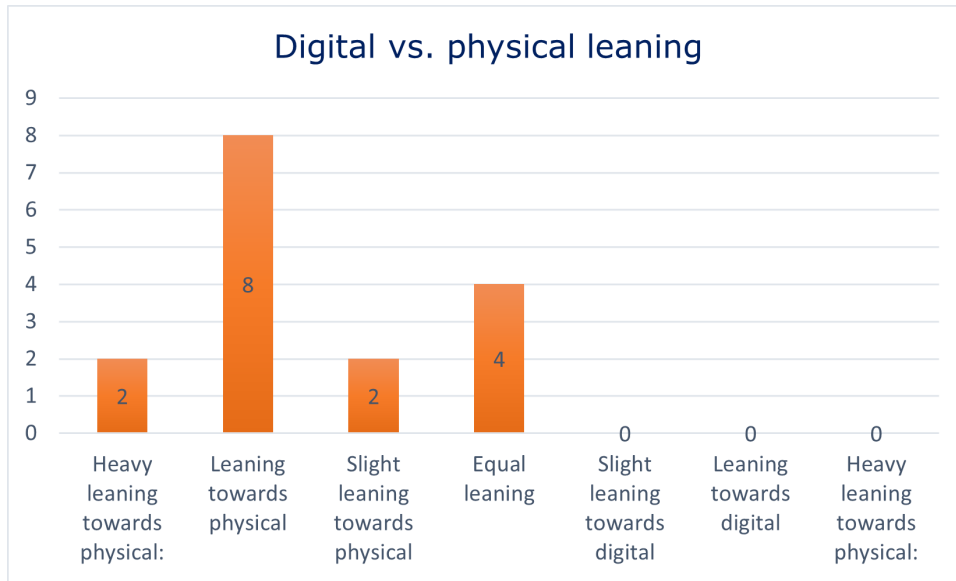


Figure 20: The leaning of the participants when discussing the similarities and differences between the physical and digital

During the interviews, the participants brought up a plethora of areas where physical and digital artefacts were similar or different. Some topics were more common than others amongst the participants, and figure 21 shows how many participants discussed each topic.

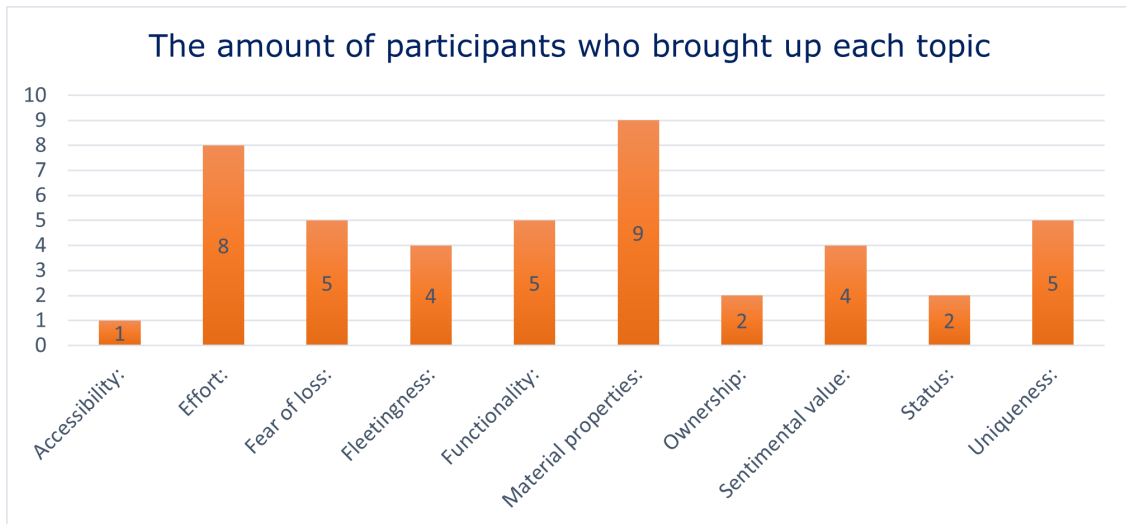


Figure 21: The number of participants who discussed each topic when they compared physical and digital artefacts

Accessibility was the least common topic, with only one participant bringing it up. The participant pointed out that digital artefacts can easily be available everywhere due to the

Internet and cloud storage. The downside to this, however, was that you can have so many of them in different places that it can be hard to find the exact one you're looking for in some situations. Physical artefacts are less accessible because they cannot be accessed from anywhere in the world like the digital artefacts can.

A lot of participants discussed the differences in efforts required to maintain physical and digital artefacts. They mentioned how digital artefacts generally require less effort to maintain than physical artefacts. Digital artefacts come across as brand new every time they are used, compared to physical artefacts which generally will have more signs of wear and tear. These signs create awareness about the state of the artefact, which gives a visual reminder that the items need to be maintained. This also made the physical artefact feel more vulnerable. Some participants said that they were used to being surrounded by digital things, which caused them to not pay as much attention to them as with physical artefacts. The participants perceived digital artefacts as easier to maintain, while physical maintenance might require some special expertise. In the same fashion, several participants reported that they felt like more could go wrong or break in a physical artefact.

Some of the participants chose to tackle the topic from the perspective of how it would feel to lose their physical and digital artefacts. One participant compared the feeling of losing a physical photo with the feeling of losing a digital photo. They concluded that both would feel terrible, as it is the memories the photos represent that are important. The ability to copy digital artefacts made them feel like a safer option. One participant pointed out that it would feel worse to lose a physical artefact, as it is the only copy. For more functional digital artefacts, one participant said that we have made ourselves dependent on them, which would make losing one worse as we are used to them always being there. We do not know what we have until it is lost.

Fleetingness was one of the more heated topics out of the ones brought up by the participants. Some of the participants with a heavier leaning towards physical artefacts used this as the main argument for why physical artefacts were more valuable than digital artefacts. Digital artefacts are not accessible in the same way as physical ones are, since a tool or device is required to view and interact with them. Their main argument was that if these tools were to disappear, the people with emotional investments in digital artefacts would lose them all. The physical artefacts on the other hand would remain in such a scenario.

Functionality was a common reason for why both physical and digital artefacts were cherished by their owners. Some of the participants discussed the difference in functionality in physical and digital artefacts. As technology progresses, the digital becomes a larger part of our society. It has become a requirement to be able to use digital objects to function in society. Most participants who discussed functionality found basic usage of digital artefacts easier than with physical artefacts. They mentioned how physical tools often require more effort learn to use and utilize, especially because of the physical effort and motor skills required.

The material properties of physical artefacts were the main reason why most participants favored the physical over the digital. Being able to use all five senses to interact with an object was important for its value. Especially touch was a sense that was missing from digital artefacts. These senses cannot be digitalized with our current technology, which some participants point to as the reason why physical objects always will be superior to digital objects in some way. It feels different to look at something through a screen than to fiddle around with it in one's hands. Digital artefacts have some elements that are hard to convert into a physical experience as well, but they are less meaningful for the value

of the artefact. Participants also said that the material properties of physical artefacts caused them to have a larger material value. Other participants questioned this view. Their reasoning was that it is the story of the object itself that makes it valuable to the individual. These stories can be created and exist for both physical and digital artefacts. They are what creates emotional value and it is the same for both physical and digital objects. Digital artefacts with emotional value are just less common. They argued that this might change as we are moving towards a society where digital artefacts are more common.

Only a few participants discussed the differences in ownership between physical and digital artefacts. One of the participants said while discussing ownership that people often own their cherished objects. What makes digital artefacts special is that they are often stored on a cloud service owned by a company. People give away the responsibility of keeping their digital artefacts safe to someone else, which is not as common with physical artefacts. They did not mention how this affects the value of digital artefacts, but it was an interesting observation.

Sentimental value was a field where the difference between physical and digital artefacts was the smallest according to the participants. They discussed how we attribute sentimental value to the artefacts in the same manner, whether they are physical or digital. Some of the participants pointed to materiality as something that helps this process, while other said that it was not important. They argued that as familiarity and usage of electronic devices among the population increases, the sentimental value of digital artefacts will increase as well. At the same time, the physical value of possessions gets reduced because of the high rate at which we replace or throw things away.

The difference in status provided by physical and digital possessions was an important topic for some of the participants. They mentioned how physical artefacts provide more status than digital artefacts. They are generally easier to show off as well. One of the participants mentioned how there is currently a movement trying to create digital artefacts that provide status and uniqueness, and they might become more equal in the future. The participant did not say whether they were a part of this movement, but they said that it was interesting to watch. They finished by saying that there are ways of showing a high status digitally, but they are less common.

Uniqueness is a problem the digital world has tried to tackle for a long time. Physical artefacts have the unique ability of being one of a kind. They also require a lot more effort to copy, and even when it is done it does not feel the same if the original artefact had a unique story connected to it. Digital artefacts on the other hand can easily be copied with little effort. This makes it so that if you lose a physical artefact you may never get that artefact back. However, if you lose a digital artefact you can often get an indistinguishable copy with little effort. A lot of the participants said that this made the digital artefacts feel less valuable. They also said that it made the maintenance of digital artefacts feel less important. On the other hand, it made maintenance of physical artefacts feel more important, since it cannot be backed up like a digital artefact can.

4.5 Age and its effect on physical versus digital

The final research question was whether age had any effect on the three other research questions. To investigate this, all the data from the other research questions were sorted by the age group of the participants. One group consisted of the participants under 30

years old, and another consisted of those over 30 years old. These were then compared to see whether there were any interesting differences between the two.

4.5.1 Age and artefacts

When looking at the differences between the participants over 30 years old and those under 30 years old when it comes to their physical and digital artefacts, the first thing to look at was the differences in their cherished physical and digital artefacts.

Physical artefacts

When it comes to physical artefacts, there were some interesting similarities and differences. As seen in figure 22, most categories were almost the same, with both groups being within one participant of each other. The exceptions were the categories “Hobby”, “Places” and “Mementos”.

None of the participants in the age group under 30 years old chose an object in the “Hobby” or “Places” categories. Some of the participants chose tools which were used for their hobby, like their sewing machine or workout equipment, but these ended up in the equipment category due to how they were used. These categories are similar, with a small differential in their definition. The “Places” category was a bit different, as none of the participants under 30 spoke about a location as a cherished physical artefact.

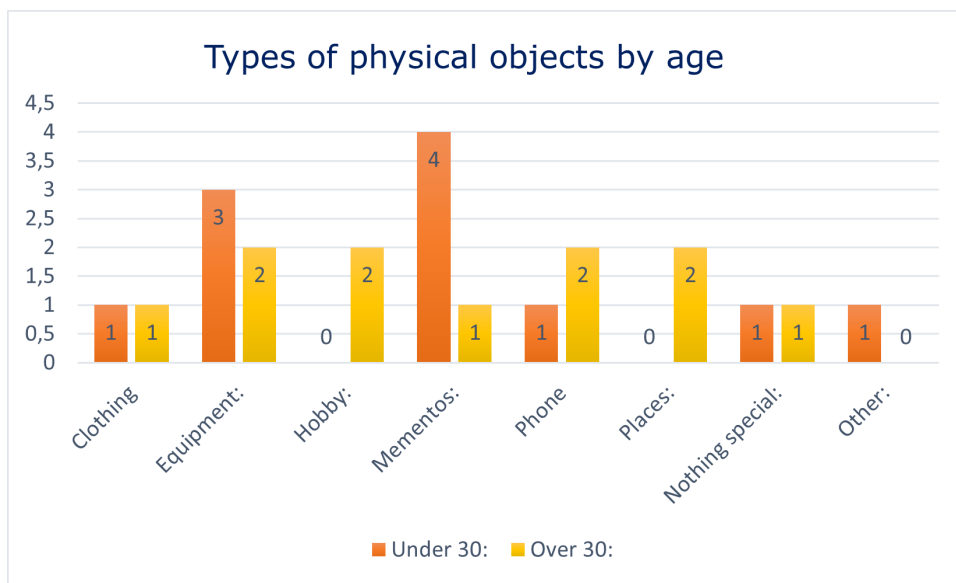


Figure 22: The different physical artefacts described by the participants sorted by age

“Mementos” was the category with the largest differences between the two age groups. Four of the eight participants in the group under 30 years old thought of a memento as one of their most cherished physical artefacts, while only one of the participants over 30 did the same. There was some overlap between the age groups, with both a participant in the age group under 30 and the single participant in the age group over 30 choosing their first teddy bear as one of their most cherished physical artefacts. But other than that, the age group under 30 had more cherished mementos.

The reasons for cherishing their physical artefacts were similar between the groups, with only a couple of exceptions. Figure 23 shows the different reasons the participants gave for

why their physical artefact were important to them. The three most common categories “Functionality”, “Positive feelings” and “Sentimental/Nostalgia” all had the same, or close to the same number of participants from both age groups.

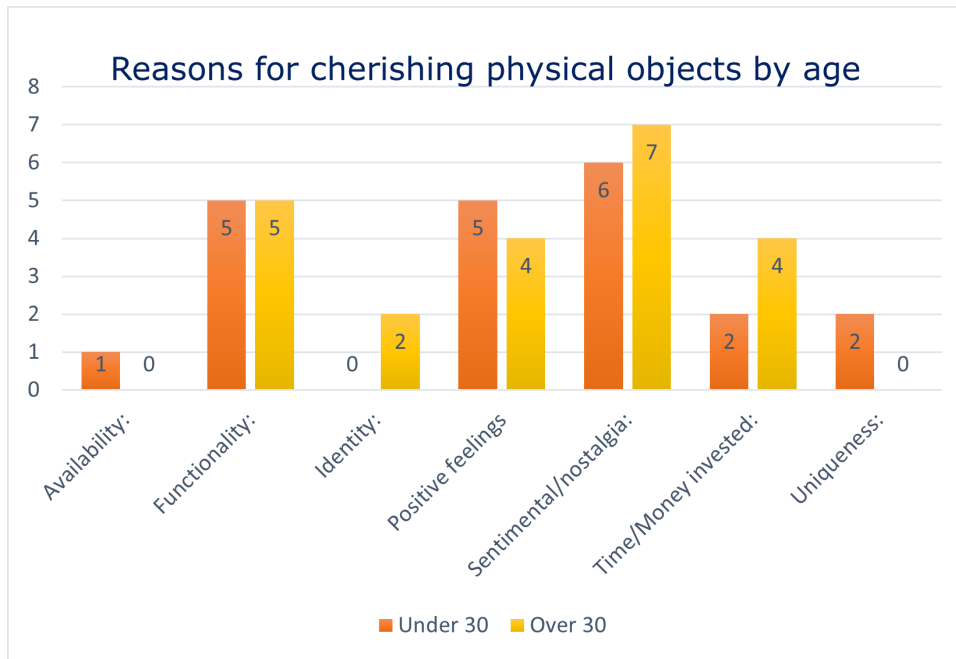


Figure 23: The reasons participants had for cherishing their physical artefacts sorted by age

Time or money invested was a category where there was a difference between the participant in the age group under 30 and the age group over 30. All the participants in this category described having spent a lot of time and money to either acquire or maintain their physical artefacts. The large amount of money spent was the most common reason in both age groups. While there were more participants in the age group over 30 than in the age group under 30, they still had a similar reasoning.

None of the participants in the age group under 30 described their cherished physical artefacts as an important part of their identity. In the same vein, none of the participants in the age group over 30 spoke about the uniqueness of the artefact as a reason why it was valuable to them.

Digital artefacts

When the digital artefacts were compared to the physical, it was interesting to see the lack of diversity in the digital artefacts. Most of the participants’ digital artefacts could be categorized as “Mementos”. Figure 24 shows the types of digital artefacts the participants spoke about as important to them, sorted by age group. The figure shows that all eight of the participants in the age group under 30 had a memento as a cherished digital artefact.

The participants in the age group over 30 had more diversity in their cherished artefacts, with only four of them describing a memento. Figure 24 shows five mementos, but one of the participants mentioned two different digital artefacts, which both were categorized as mementos. It is also interesting that the participant who mentioned that they did not have any cherished artefacts was in the age group over 30.

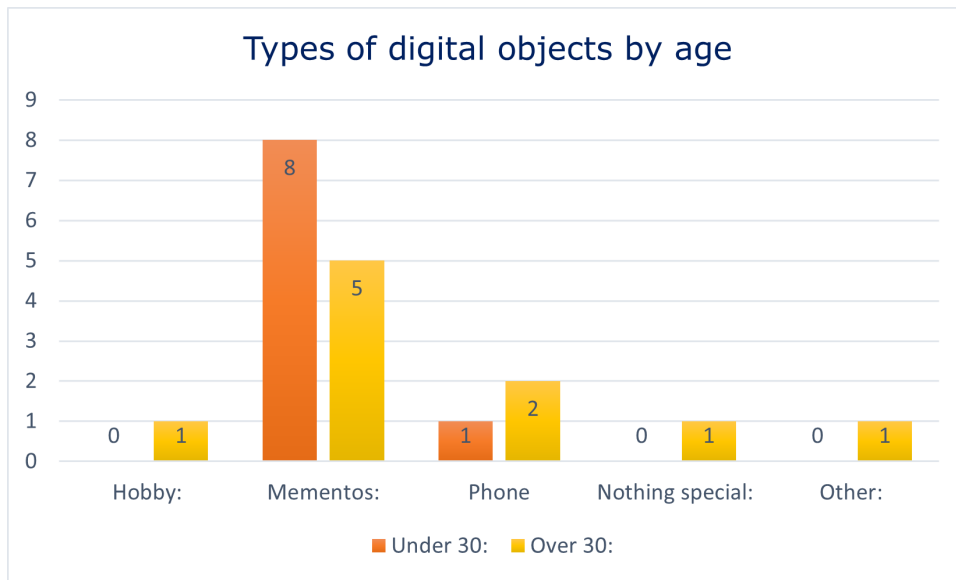


Figure 24: The different digital artefacts described by the participants sorted by age

Upon closer inspection of the "Memento"-category, the data shows that digital images are the most common type of digital artefacts in both age groups. Seven out of the eight participants chose to describe their digital images in the age group under 30. For the age group of participants over 30 years old, all four participants who cherished an object classified as a memento also saw their digital images as a valuable digital artefact.

The reasons for cherishing their artefacts were also more varied with the digital artefacts compared to the physical artefacts. Figure 25 displays the different reasons provided by the participants for why their digital artefacts were valuable to them. Like with physical artefacts, the age groups under 30 and over 30 were close to even. The main exception was the category for sentimental or nostalgic feelings. None of the participants over 30 years old reported valuing their digital artefacts due to them getting positive feelings that were not sentimental or nostalgic. The one participant who did was in the age group under 30.

Time and money invested into the object was an important reason for why the physical artefacts were valued, but there were less participants who mentioned it when discussing their digital artefacts. With both physical and digital artefacts, a small majority of the participants were in the age group over 30. It is interesting to note that every participant in the age group under 30 who had a valued digital artefact other than digital images, valued them because of their functionality.

The big difference between the reasons why the participants cherish their artefacts lay in the "Sentimental/Nostalgic" category. Every participant in the age group under 30 cherished a digital artefact because of sentimental or nostalgic reasons. Every participant who cherished a digital image, or collection of digital images, mentioned sentimental or nostalgic reasons as well.

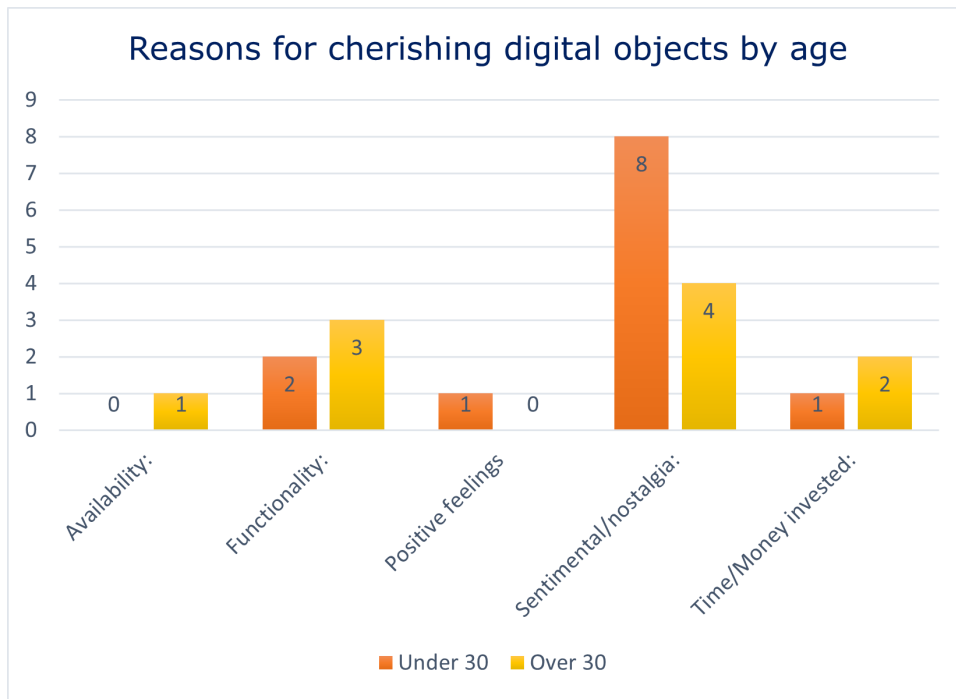


Figure 25: The reasons participants had for cherishing their digital artefacts sorted by age

The phone category became more interesting when the physical and digital artefacts were combined. Only two participants in the age group under 30 cherished their phone, while four of the participants in the age group over 30 did the same.

4.5.2 Age and maintenance

When looking at maintenance and the participants' physical and digital artefacts, a good starting point is with which of their artefacts they put more effort into maintaining. Figure 26 shows whether the participants put more effort into maintaining their physical or digital artefacts sorted by their age group. The distribution between the two groups are close to even, with a difference of only one participant in two of the three groups.

When looking for differences in the effort put into maintenance between the age groups, there are no notable differences when it comes to their physical artefacts. Both age groups had a mixture of people who put no effort into either of their artefacts, people who put in some effort, and people who put in a lot of effort. On average, the age group over 30 put more effort into maintenance due to the difference in physical artefacts. The two participants who mentioned their cabins pull up the average by a lot. This is also the case with the digital artefacts, where those who had a cherished digital artefact put in variable amounts of effort depending on the participant. Six out of the seven participants in the age group over 30 who had a valued digital artefact had some sort of back-up or security for their digital artefacts. In the age group under 30, six out of eight participants had some sort of back-up for their digital artefacts. It is important to note that for the participant with the game save file, there does not exist any way to do a digital back-up of the save file. Both age groups in general put more effort into their physical artefacts compared to their digital.

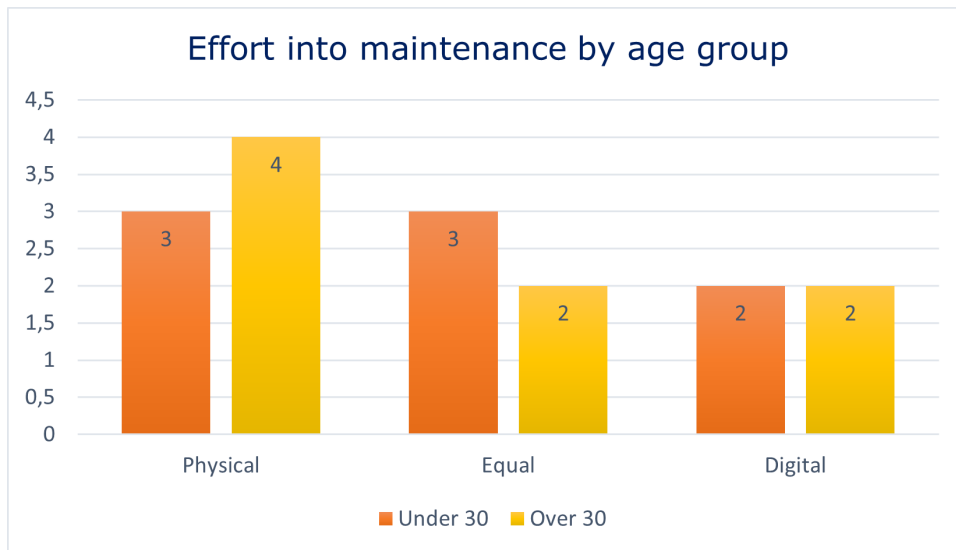


Figure 26: The distribution of which of their artefacts the participants put the most effort into maintaining sorted by age

4.5.3 Age and perception of digital and physical

When the participants were asked about their thoughts on the similarities and differences between physical and digital artefacts, they were able to give their honest opinions about the topic. During the analysis, the participants were categorized from “Heavy leaning towards physical” to “Heavy leaning towards digital”. Figure 27 displays the participants’ preference sorted by their age group. The only differences between the two age groups are that the age group over 30 had two participants in the “Heavy leaning towards physical”-category, while the age group under 30 had two participants in the “Slight leaning towards physical”-category. The small difference in leaning between the two age groups suggests that the older participants had a larger preference towards physical artefacts than the younger participants.

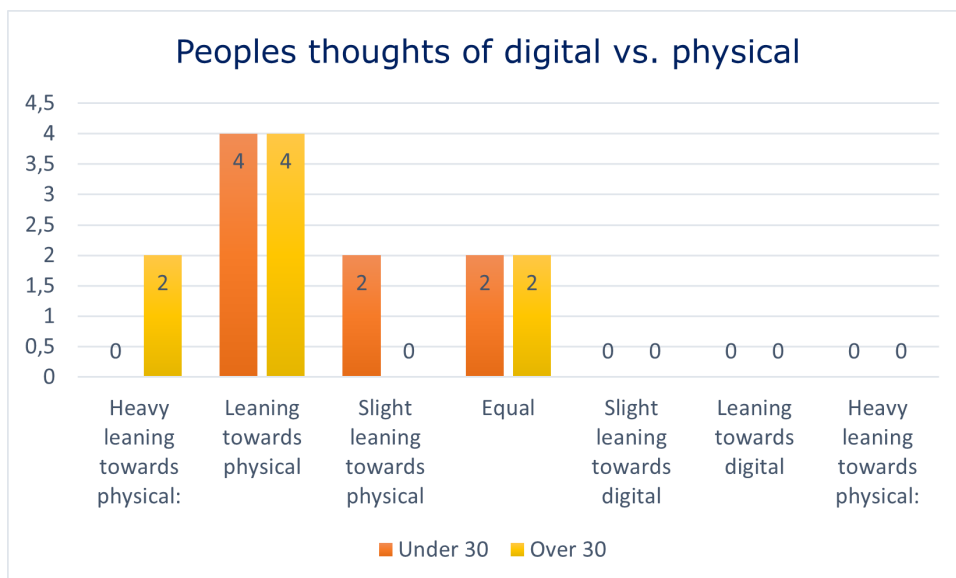


Figure 27: Participants’ thoughts on the digital versus the physical sorted by age group

Most of the topics the participants brought up when reflecting on the differences between physical and digital artefacts were similar between the age groups. However, there were some significant differences in the number of participants who discussed certain topics. Figure 28 shows the distribution of how many participants discussed certain topics. In the figure, there are three topics that stand out.

The first one is effort, which was discussed by seven of the eight participants in the age group under 30. Only one participant in the age group over 30 brought up the same topic. The age group under 30 were more concerned with the difference in effort required to maintain them. They also preferred the simplicity of digital artefacts compared to the physical ones, both when it comes to ease of use and ease of maintenance.

The second topic which was brought up more frequently in one age group was functionality, which was more often mentioned by participants in the age group over 30. The difference in functionality between physical and digital artefacts were important to the older participants. They thought that both physical and digital artefacts had certain situations where their functionality was important. The digital artefacts might feel easier to use, but some of the participants would still prefer physical objects and tools over the digital ones. They also discussed how some of them felt the digital artefacts lost some of the social elements that are present in many physical artefacts. Physical elements are easier to talk about and share with others compared to digital artefacts, since they are physically in the room.

The third topic which was more frequently discussed by one of the age groups was uniqueness, where no participant in the age group over 30 brought up the topic. The younger participants acknowledged that since physical items generally are unique in a way digital object cannot be, they can have a different kind of value than digital artefacts. Both physical and digital artefacts can have emotional value, but only physical items can have materialistic value. When the material value is combined with the emotional value, the physical artefacts generally have a higher total value.

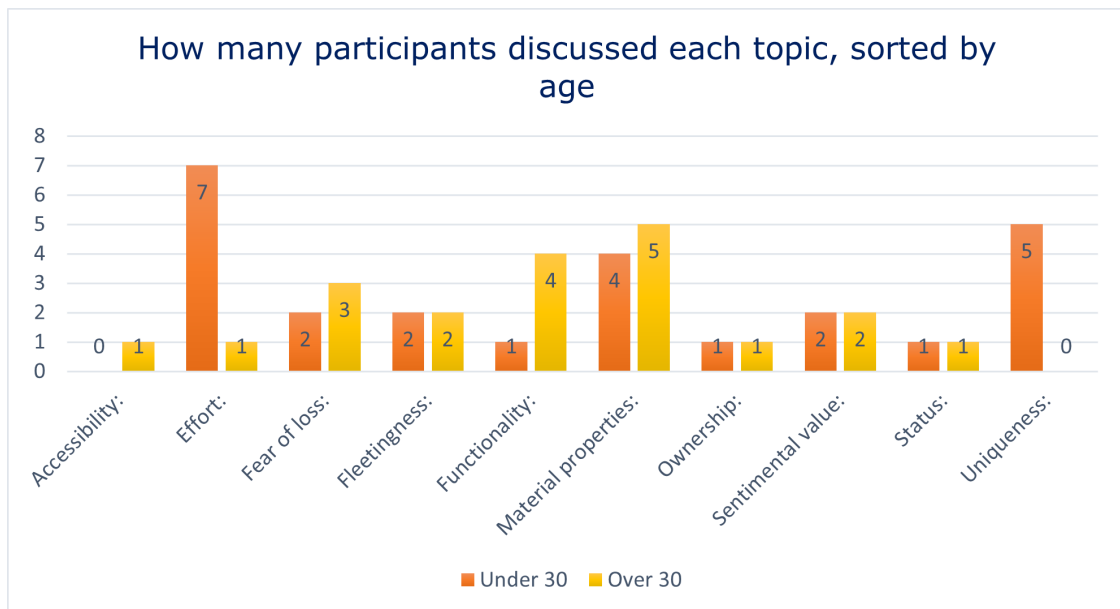


Figure 28: The distribution of how many people discussed the different topics, sorted by age

Some participants were more open to the value of the material properties not being essential for its importance, but there was no significant regarding which age group that was more open to digital artefacts. Both groups acknowledged that the physical elements are important and is the property that differentiates the two the most, and it is therefore hard for digital artefacts to be completely equal.

There were no significant differences in opinion between the two age groups for the rest of the topics. They generally brought up similar arguments for and against both digital and physical. Both age groups thought the way digital artefacts often can be easily copied made them safer, and therefore people are generally less scared of losing them. The participants in both age groups who discussed the sentimental value of digital and physical artefacts thought that there should not be any difference between the two. They thought it was possible for a digital artefact to have as much sentimental value as a physical one. What the participants thought about these topics are described in the section “Perceived similarities and differences between the digital and the physical” (Section 4.4.2).

5 Discussion

In this chapter I will be discussing various findings in the study presented in the “Analysis and findings”-chapter (Section 4), and compare it to some previous research results.

5.1 Relations to digital artefacts

As I have sought to understand how we relate to digital artefacts, I have gotten insights into how we relate to physical artefacts as well. Physical and digital artefacts have a lot in common, but there are some interesting differences found through the interviews with the participants.

As several of the participants pointed out when asked to compare the digital to the physical, there were no significant difference in the emotional attachment between the physical and digital artefacts. The participants had a strong emotional connection to their artefacts for a plethora of reasons. A lot of the artefacts caused some sort of nostalgic or sentimental feeling in the participants, as they felt like the artefacts reminded them of something important from the past. This could either be past events or people. This is the same result as Turner and Turner (2013) found in their study, where they found there to be no significant difference in emotional attachment to the artefacts. It did not matter whether the artefact was physical or digital, it was what the artefact represented and allowed the people to do that made it significant to them. However, there were some differences in why the participants had a strong emotional attachment to their physical and digital artefacts.

The most common reason for cherishing both physical and digital artefacts were sentimental or nostalgic feelings, but the physical artefacts had a wider range of emotions explaining why they were valuable to the participants. Participants reported several types of positive emotions when discussing their physical artefacts which were not present when they discussed the digital ones. Emotions such as the feeling of freedom or the feeling of being challenged by the artefact were associated with some of the participants’ physical artefacts. There were not any examples of these emotions being present in any of the digital artefacts. Some of the participants said that their physical artefacts were a way for them to relax and recharge their batteries, but this sentiment was not presented by the participants when discussing digital artefacts.

While digital artefacts were generally cherished by the feelings they evoked in the participants, functionality was a lot more important for physical artefacts. When discussing physical artefacts, what the artefact allowed the participants to achieve or do was a big reason why it was valuable to them. For the items categorized as “Equipment”, functionality was the main reason why they were cherished in the first place. The main exception to this were the participants who categorized their phone as a digital artefact. However, it can be argued that the phone also could be classified as a piece of equipment, as the participants mainly cherished it for what it allowed them to do instead of the physical phone itself. Every participant said that they would not mind replacing their phone with another model, as long as they got to keep the digital content. Functionality was important to some of the digital artefacts as well, but not to the same degree as with the physical artefacts. An example of this is the participant who cherished an online game, where the functionality of allowing the participant to socialize was an important reason why it was valuable to them. This points to functionality being important for the value of some artefacts, and is a way for designers to create more easily cherished artefacts for

consumers.

The data from the interviews suggests that the reason for cherishing an artefact often is linked to the type of artefact being cherished. The participants who described similar digital or physical artefacts often had similar reasons for cherishing them. For example, every participant who described cherishing digital images as digital artefacts mentioned how they induced positive nostalgic feelings. It helped them remember things and made them think of happy moments in their life. This caused the participants to associate the digital images with a good feeling. Another example is the participants who cherished their phone. Functionality was the most common reason why participants cherished their phones. It was valuable because of what it allowed the participants to do, not necessarily for the phone itself.

As there was a wider range of physical artefacts than digital artefacts, it is suggested that there might exist a larger variety of cherished physical artefacts than cherished digital artefacts. In the interviews, the participants were only asked about one of their digital artefacts and one of their physical artefacts, which means that they probably did not talk about every cherished artefact they own. However, the lack of variety in digital artefacts suggests that the participants may have more cherished physical artefacts than digital artefacts. Almost every participant discussed their digital images as a cherished digital artefact, which points to images being the most common valued digital artefact. It is possible that most of the participants do not have any other cherished digital artefacts. This result would be supported by the findings of Feinberg (2013) and Golsteijn et al. (2012), who found that people tend to cherish their physical artefacts more than their digital ones. During the interviews, many of the participants needed help with identifying their cherished digital artefacts. However, this difficulty is likely caused by the term digital artefact or digital object being difficult for the participants. Similarly, Golsteijn et al. (2012) that the term “object” was difficult for the participants to understand when discussing digital artefacts. The participants were not necessarily aware of their cherished artefacts in the same way they were aware of their physical artefacts.

5.1.1 Hybrid objects

Several of the participants chose what could be categorized as hybrid artefacts by the definition of Kirk and Sellen (2010). Kirk and Sellen (2010) defined hybrid artefacts as objects with physical elements, where the digital content they contain is what makes the object emotionally valuable. These hybrid artefacts were present in both the participants’ physical and digital artefacts. The prime example would be the mobile phone. The participants said that the things they could do with a phone, and the digital content stored on it, was what made it valuable to them. Other examples of cherished hybrid artefacts the participants brought up during interviews were a game save file and an LP record. The cartridge containing the game save file is another prime example of a hybrid artefact. The owner of the cartridge said that it represented their childhood, but the game and the digital content was the reason why it was important to them. The LP record can also be classified as a hybrid artefact, but the reason it was cherished was a bit different from the theory presented by Kirk and Sellen (2010). The owner of the record said that it was valuable to them because the record was made by a band they enjoyed a lot. Another major reason it was valuable was that it was a gift from a loved family member. This is an artefact that in some ways disagrees with the findings of Kirk and Sellen (2010). The content of the LP record was important for its value, but not the most important element of the artefact like they theorized in their study. However, this is just one example and the

rest of the hybrid artefacts presented by the participants support their theory of hybrid artefacts.

5.1.2 Digital and physical companions

The artefacts defined as companions by Zijlema et al. (2016) were to be found amongst the artefacts described by the participants. They were in general mundane objects that had acquired special meaning over time. The artefacts the participants shared which could be categorized as companions were mostly physical artefacts, but there was one digital artefact that could potentially be defined as a companion as well.

The physical artefacts that could be defined as companions were mostly teddy bears. Two of the participants spoke about their old teddy bear as a cherished physical artefact. For both of them it was the first teddy bear they received as a child, and it has since then followed them as they grew older and been there through different life events. It is an object which has always been there for them through thick and thin. This has made the teddy bears more valuable to them over time, and because of that they have strong emotional attachments to them. For one of the participants, it is also important for another reason. During the interview the participant said that the teddy bear was a gift from a late grandparent, and it helps the participant remember them fondly.

Another example of a potential companion is the bunad of one of the participants. When describing why their bunad was important to them, mentioned how that they had worn it for several special occasions throughout their life, and that it has kind of followed them on their journey through life. The problem with the definition of bunad as a companion is that a bunad is not supposed to be a mundane object. Bunads are expensive, and their design depends on where you are from. The bunads from Northern Norway has different patterns and colors than a bunad from Southern Norway. It is not uncommon for bunads to be passed along through the family as well, which means that for many people the bunad might have been previously used by a grandparent or parent. In the definition of companions, they are supposed to be mundane items that do not have any special meaning when acquired, but slowly gain value over time (Zijlema et al., 2016). While the bunad has gained emotional value as it followed the participant through life, it already had value from the start because of the participant's identity and the money invested into it.

The final example of a potential companion is the digital game save file. The participant described it as a game that has followed them throughout their life and started their love for the Pokémon franchise. It is an old game, and they received it while they were still young. On its own it is just a game, but as time has gone by the participant has gotten more emotionally attached to the game and their old save file. As with the bunad, the participant described that there were several reasons why the game save was valued. An important reason was it being their first experience with a game world, and it introduced them to the world of fictional games. They also invested a lot of time into the game, which increased its value as well. Therefore, it can be partly defined as a companion, but the term does not encapsulate all the reasons why the save file was important to the participant.

5.1.3 Digital images as a digital artefact

With 11 out of the 16 participants talking about their digital images as a cherished digital artefact, it was the most common type of artefact in the entire study. Digital images in themselves are interesting due to their direct comparison to physical images. Both represent a snapshot of a point in time, where it captures events, people, and objects of interest. The major difference between the two is their format and how they are stored.

Physical images have for long been the dominant way to store images through photo-albums. Every single photo you wanted to get printed cost money. This meant that you had to choose which images to take care of and maintain in a photo album, while the rest either went into a box for storage or in the trash. This resulted in people taking less pictures as well, since the quality of the images were more important than the quantity. When digital cameras started to become more common, this changed. While many still preferred to print out their photos and store them in photo-albums, this was no longer required to be able to maintain and keep the images. Digital images could easily be transferred to a computer, with only the storage space of the hard drive limiting how many digital images it was possible to store. As technology progressed, cameras got more readily available through mobile phones. After a while, everyone always had a camera available, and hard drives were getting big enough to where it was possible to save several hundred, if not thousand, digital images at once. This changed how people took and stored images.

Feinberg (2013) critiqued the idea that digital images were themselves considered cherished digital artefacts. She meant that they were only valuable because of their functionality to provide access to different works, not for the file itself (Feinberg, 2013). By comparing it to the hybrid category of artefacts (D. S. Kirk and Sellen, 2010), Feinberg (2013) argues that like how a CD is not valued for the disk itself, but the content on it, digital images are not valued because they are images, but because of the imagery they contain. She further used this reasoning to criticize the idea of cherished digital artefacts, as the participants in reality are cherishing something non-digital represented by a digital object (D. S. Kirk and Sellen, 2010). Feinberg (2013) points out an important detail about images, but she missed some of the important factors in her task to define all digital images as a piece of work instead of its own object. For several participants in the study, they said that their digital images were important to them for several reasons. The most common one was that the images showed memories and other things with importance to the participants, but some also cherished the collection of images due to the effort that went into its creation. An example of this is the participant who had photography as a hobby. They described how the effort of setting up and creating all those images were an important reason why they were valuable. The digital collection of files in itself was important, rather than just what the images contained. Something similar was also the case in the cherished digital game save file, or the participant who cherished their digital contacts. This is more in line with what Meschtscherjakov (2009) found, where digital artefacts works as an extension and expression of its owner.

It was expected that digital images would be popular, due to previous research pointing to their commonplace as a digital artefact, but a larger variety of digital artefacts was expected. The digital images were usually cherished for their sentimental or nostalgic values, where they helped the participant with remembering past events. This is in line with what Kirk and Sellen (2010) found about emotional attachment to digital artefacts. They said that digital artefacts are used to share and connect with others, and help us with the efforts of remembering (D. S. Kirk and Sellen, 2010). An example of this is one

of the participants, who kept a photo of their newborn nephew and old images from high school. The images helped the participant remember things and duties they do not want to forget. In this situation, the duty of being a good role model for their nephew and the remembering of events from high school were the reasons why the digital images were cherished by the participant.

5.1.4 Investment in artefacts

Some of the participants pointed to time or money invested into their cherished artefacts as a reason why it was important to them. Physical artefacts were more commonly cherished for this reason, but it was also present in some of the digital artefacts presented by the participants. The most interesting difference was how the participants invested into their cherished artefacts depending on their type. With digital artefacts, every participant who mentioned their investment into it said that they had invested a large amount of time into their artefact. Most of the digital artefacts that were valued for the time put into them were things the participants had created themselves. One of them was a digital collection of images by a participant who had photography as a hobby, and the other was a collection of written works the participant wrote themselves. The last digital artefact was an online game the participant had put in a lot of time and effort into to progress. None of the participants had put any significant amounts of money into the digital artefacts themselves.

This is where the major difference between the physical and digital artefacts was observed. Money invested into the artefact was a larger factor for why the physical artefacts were important to the participants than the time invested into them. The participants often mentioned that they had spent large sums of money to either buy, maintain, or upgrade their physical artefacts. This was not the case for every participant though. For some of the participants, the time invested was as important, or more important, than the money invested. However, for most of the physical artifacts where the participants talked about their investment into the artefact, money was the more dominant of the two.

This is an interesting difference, as it signifies how the digital artefacts were not valued for their economic value like physical things were. They could in a way be described as more personalized objects, which the participants had created themselves. Many of the physical artefacts, while having unique designs, were often objects where there could exist similar objects elsewhere. Like the participant who cherished their expensive bike. There is a large possibility that the same kind of bike was mass produced and that there are several other identical bikes in existence. However, this concept of uniqueness was not completely exclusive to physical artefacts. The digital online game cherished by one of the participants has a designed gameplay-loop which makes the gameplay experience similar for every player. In this case the experience is not unique, but the participant has taken ownership of their own experience.

It is important to remember that the time or money invested into the physical or digital artefacts were never the main reason why the artefact was valuable to the participants. It was often a secondary reason, with other reasons like sentimental or nostalgic feelings and functionality being more important. The fact that the participants had spent a large sum of money on the artefacts was not the first thing they mentioned when they talked about it. Some of the participants used time and money invested into the artefact as a measurement to show how much the participant cared about the artefact. By being willing to spend that much money on it, it must be important to them.

5.1.5 Artefacts and our identity

When asked for the reason why their artefacts were important to them, only two out of the 41 artefacts were mentioned as being important due to them being a part of the participant's identity. This is a surprisingly low number of artefacts compared to the expected number beforehand. Several previous studies done in this area points to identity as a key reason why artefacts were important to individuals (Ahuvia, 2005; R. Belk, 2014; R. W. Belk, 1988, 2013; D. S. Kirk and Sellen, 2010; Orth et al., 2019; Orth et al., 2018; Watkins and Molesworth, 2012; Zijlema et al., 2016). Because of this previous research, there was an expectation that identity would be a common term amongst the participants after the literature review. However, for the participants in this study, most of them did not identify their own identity as a reason why the artefact were important to them.

There are some possible explanations for why most of the participants did not describe identity as a reason for why their objects were valuable to them. One possible reason why is the sample of cherished artefacts per participant. Instead of asking about and discussing every cherished physical and digital artefact they owned, we chose to go in-depth on a few of them. This meant that the sample of artefacts was on average 1.4 physical artefacts and 1.2 digital artefacts per participant. There is a possibility that the participants only chose to speak about their most cherished artefacts and that identity is more prevalent in the rest of them. If this was the case, identity would be more common if every participant talked about a larger variety of their cherished artefacts. The findings from the interview suggests that similar types of artefacts often have similar reasons for cherishing them. This means that in a larger sample with a higher variance in cherished physical and digital artefacts, identity could be a more common reason for why the artefact was valuable to the participants.

Previous research mostly focused on implicit identity, where they found that the participants indirectly talked about their artefacts as a part of their identity. These researchers used an etic perspective to analyze the participants' behavior and artefacts. In this research project I chose an emic approach during the analysis. This is an important difference, as the artefacts may be important because of the participants' identity, but the participants do not explicitly state this themselves. Studies with an etic approach may find that the participants are implicitly discussing their own identity, while an emic approach may find that only a few participants discussed identity.

There is a long history of research on how we identify ourselves by the things we have, with several studies pointing to the connection between emotional value and identity. However, according to the findings in the interviews, identity is not a common reason explicitly stated by the participants. Reasons like the functionality of the item, the emotional feelings attributed to the item like nostalgic or sentimental feelings, or the time and money invested into the artefact are often found to be more common than identity.

5.1.6 Those with "Nothing Special"

Some of the participants, when asked about their artefacts, ended up in the "Nothing Special"-category. That was the category for those, who when, asked could not think of any artefacts they have an emotional connection to or cherish. Being in this category does not mean that they did not think of anything later in the interview, as two out of the three participants with answers in this category did later identify a cherished artefact. Both participants who could not think of anything when asked about their physical artefacts

found something later in the interviews, after having been given longer time to think. The one who answered that they had nothing special when asked about digital artefacts did not bring up any cherished digital artefacts later in the interview.

This is an interesting response, since it might indicate that they may not have any physical artefact cherished to a degree where they think about it often. As one of the participants said when asked about their physical artefacts: “There’s not much of that for my part, but I cannot think of anything historical from my family either”. Later in the interview, the participant mentioned that they had some souvenirs from different holidays which were a little bit important to them. The participant had some physical artifacts they cared about, but it was not important enough for them to remember them right away.

The most probable cause for these answers were that the participants simply did not have any cherished physical or digital artefacts important enough to be remembered in the moment, but there are other possible explanations as well for these situations. Cherished artefacts is a personal affair, and is often closely connected with who you are (Orth et al., 2018). Some participants may not have been comfortable sharing something so private with the researcher.

Another possibility is that both participants who later remembered a valuable physical artefact may have done so to please the researcher. They may have thought of something which they did not really cherish much, because they thought having a cherished artefact would “help” the researcher. This theory is supported by how the participants answered when they were asked about their cherished physical artefacts the second time. During the interviews, if the participants said that they could not remember any cherished artefacts, we agreed on returning to that topic later in the interview. This was done to give the participant more time to think. When asked a second time the participants may have felt pressured to answer, which made them think of a less important artefact they own. When asked a second time, one of the participants answered in a kind of disinterested tone: “I guess I can pick a teddy bear”. This quote is translated from Norwegian, which may result in some of the tonality of the sentence being lost, but the choice of words made it sound like they answered to please the researcher instead of answering to share something special.

Watkins and Molesworth (2012) wrote about how possessions could lose their emotional value over time. They say that they may lose their sacred status, due to negative associations, other competing objects, or lack of space. People may associate objects with something they do not identify with anymore (Watkins and Molesworth, 2012). The participant who mentioned not having any cherished digital artefacts said during the interview that they used to spend a lot of time in digital video game worlds when they were younger. They now expressed that they felt like this was wasted time. The participant did no longer identify themselves with these kinds of digital artefacts and experiences. This might be a situation which is an example of what Watkins and Molesworth (2012) were describing when they talked about how cherished artefacts can lose their emotional value due to negative associations. The participant may have had cherished digital artefacts when they were younger, but these no longer had any special meaning to them as they did not identify with them in the same way as they did back when they were younger.

5.2 Safekeeping and maintenance

An interesting finding from the interviews was that there were some notable differences in how the participants maintained their physical and digital artefacts. When discussing their physical artefacts, participants were actively describing the actions they took to ensure that the artefact did not degrade or break. They were additionally often doing activities which improved on the current condition of their artefact. This was a bit different with digital artefacts, as the participants often used back-ups as their way of maintaining and protecting the digital objects.

This leads to the question of whether the word “maintenance” a good fit for how the participants protected their digital artefacts. I suggest that the word “safekeeping” is a better fit. Maintenance is the act of taking care of something, while I define safekeeping as preservation of the artefact in a safe place or location. With their physical artefacts, participants often took both preventative and reactive measures to ensure that they did not degrade. Examples of this are the participant who cherished their car and the participant who cherished their sewing machine. The participant with the cherished car went to great lengths to repair and switch old parts of the car to maintain it. There were also preventative measures taken to ensure that the car did not break down, through oil shifts several times a year and active maintenance every 10 000km. The same was the case with the sewing machine. The participant mainly instated preventative measures, such as keeping it under a protective cover, but also instated reactive measures, such as technical maintenance on the machine when needed. This way the machine was always in the best condition possible. With digital artefacts, none of the 16 participants reported having any reactive measures to maintain their artefact.

The reason for this difference may be in the difference in attributes of physical and digital artefacts, but also from the perception of the participants. Some participants reported that they felt like digital objects always seem as good as new no matter how old they are. Mardon and Belk (2018) also writes about this concept when they discuss digital collecting. Every object always seems as good as new, there are no second-hand digital objects. They are always perfect mint (Mardon and Belk, 2018). Digital objects always being in perfect condition makes it hard to know if any reactive measures are necessary. A physical artefact has a visual degradation, which makes it easier to see when it needs reactive maintenance. This can also be related to something another participant said when asked about differences between physical and digital artefacts. They thought that the knowledge required to maintain digital artefacts were a lot higher than physical artefacts. Maintenance of physical artefacts may require another skillset than that which is required to maintain a digital artefact. As digital artefacts often are linked to the IT field in some way, they might require their owners to have a certain level of knowledge in the field to know what to do or how to maintain their artefacts on their own. There exist services that help with safekeeping for those who does not have this knowledge, such as Dropbox, Google Disc, and iCloud. An example of more reactive activities that can be done to maintain a digital artefact could be to check for file corruption in the system to prevent the files from being corrupted.

Another reason for why digital artefacts are safekept instead of actively maintained like their physical counterparts are uniqueness. When participants were discussing their fear of losing their digital artefacts, they said that they were not afraid of losing them at all. Since the digital artefacts were so easy to copy, it did not matter if they lost a copy as long as they had backed it up beforehand. This was the same thing reported in previous research, where it was found that digital objects are so easily copied that it is hard to care

for a single copy of the artefact (Mardon and Belk, 2018).

Participants said during the interviews that they generally had more trust in digital systems compared to physical things. They trusted that a system would not fail and that their objects would be maintained automatically. This trust was not present in physical artefacts, which makes the participants feel like they have to put more effort into maintaining them. This observation was backed up by how the participants maintained their artefacts. In the results chapter, the participants were sorted into categories based on which of their artefacts they put the most effort into maintaining (Section 4.3.4).

An interesting observation was how the participants safekept their digital artefacts. There was a mix of methods for safekeeping. Some used cloud-storage services to protect their digital artefacts online, while others used physical hard drives which they could physically protect. Out of the participants who used backups to protect their digital artefacts, a majority of them chose to use an external hard drive or a similar physical storage object. This makes sense, as ownership is important for cherished objects. A participant said that when a digital artefact was stored in an external service, it felt a little bit like trusting someone else to take care of it instead of taking care of it themselves. Participants felt like they had more control over their digital artefacts when it was on a physical hard drive. Previous research on the topic of ownerships points to the same thing, where lack of control is a common problem with digital artefacts (Watkins and Molesworth, 2012). It does, however, contradict what some of the participants mentioned in the interviews. Some participants said that they felt like physical objects were more vulnerable, and there are more things that can go wrong or that can break the object. Despite this, it seemed like the element of control over their own artefacts was more important than the perceived risk of storing it on a physical hard drive.

As most of the participants put more effort into their physical artefacts, it is probable that people in general put more effort into maintaining their physical artefacts than their digital artefacts. The participants pointed out a plethora of reasons for why that might be. The data from the interviews suggests that it depends on the type of object people cherish. Artefacts that were cherished for their functionality were maintained more than artefacts cherished purely for sentimental or nostalgic reasons. This aligns with what the participants meant when they said that the physical aspects of physical artefacts make their owners more aware that they need maintenance. Objects with a specific purpose or functionality is more commonly interacted with than an object which is kept just to help the owner remember something. Some participants mentioned that the lack of uniqueness in digital artefacts makes them feel less important as well, as there can exist several copies of the same artefact. This makes it not feel as important if one of the copies are lost, as long as one copy remain.

The amount of effort put into artefacts might depend on the individual, as different participants put different amounts of effort into their artefacts. Some participants put little to no effort into any of their artefacts, while some participants put a lot of effort into both of their artefacts. This suggests that there might be some individual factors that affect how people maintain their artefacts and how much effort they put into them. Despite this, no matter whether the individual participants put little effort or a lot of effort into maintenance, physical artefacts were still in general receiving more maintenance and attention from the participants.

5.3 The physical versus the digital

It was no big surprise that most of the participants preferred the physical over the digital. The previous research done in this area suggested that while it is possible to have digital artefacts and value the digital greatly, most people find physical artefacts to be more valuable and easier to cherish (Feinberg, 2013; Golsteijn et al., 2012; Gruning, 2017; Zijlema et al., 2016). The participants presented a plethora of reasons why they thought they were different, and how these reasons made one better than the other in some areas. But in the end, they all agreed that physical artefacts had some properties the digital could not match with existing technology, even though they were equal in other areas.

Some of the participants thought that the digital and physical were close enough to be considered equal, where they argued that as technology progress and becomes more imbued in society, the value of digital artefacts increases. Some also pointed to how they think they are equal from an emotional attachment perspective. This last point has already been presented by previous research (Turner and Turner, 2013), so it is interesting that some of the participants brought up the exact same point as Turner and Turner (2013).

One of the most common arguments for why the physical was superior to the digital was their material properties. The ability to use all senses to interact with a physical object makes it more valuable. During one of the interviews, one participant said this when talking about material properties:

“There are certain elements about the physical which can’t be digitalized. The physical artefact I mentioned, you can take digital pictures of them, but it won’t be the same. It’s something about picking one up, looking at it, rotating it around, right? You can’t do the same if you do it online.”

The participant summarizes the point about material properties perfectly. There are certain things that is not possible with our current technology. However, digital artefacts also have some strengths compared to physical artefacts when it comes to material properties. Digital artefacts take up less physical space than their physical counterparts, which makes them easier to store. However, participants said in the interviews that this also makes them feel more replaceable and lack the material value physical artefacts have.

Several of the participants said that there is little difference between physical and digital artefacts when it comes to sentimental value. One participant said that humans use the same internal mechanisms to build sentimental value towards objects, so it makes sense that they are equal. They argued that the material properties did not increase the sentimental value, just made it easier to form sentimental value. Every participant did not agree with this sentiment. Some participants thought that the ability to physically interact with their artefacts were essential for the sentimental value of them. Previous research points to there being little difference in emotional attachment between physical and digital artefacts (Turner and Turner, 2013), but cherished physical artefacts are generally more common (Feinberg, 2013).

Fleetingness was an important argument for why physical artefacts were superior to digital artefacts for some participants. The main argument used against digital artefacts was the idea that digital artefacts are dependent on tools or devices to be interacted with, which makes them less valuable and easier to lose than physical artefacts. Physical artefacts do not have the same dependencies, which means that they do not lose any value if the digital tools or devices are unavailable. Several participants argued that things being

easily replaceable lessens their value. This is interesting, as the perspective of fleetingness is based on the participants' fear of losing digital artefacts. Several participants talked about the fear of losing their artefacts in the interview, and they often had the opposite perspective on the topic. They were more afraid of losing their physical artefacts than their digital artefacts, due to how easy most digital artefacts are to copy. The other participants generally trusted that the digital systems would work as intended, which made them not worry about the fleetingness of digital artefacts. They were concerned with the uniqueness of the artefacts, however. As the digital artefacts are abundant, they are not as easily lost, but it may also affect their value (Mardon and Belk, 2018).

The abundancy of digital artefacts leads us over to uniqueness. Several participants discussed how uniqueness affects the value of digital and physical artefacts. The fact that physical artefacts often are unique and digital artefacts are not, physical artefacts often feel more valuable and important. Once a physical artefact is lost, the participant argued that you would most likely never get it back. Digital artefacts on the other hand could easily be copied, which means that if a copy is lost, it is possible to just restore one of the many indistinguishable copies and have a similar digital artefact like nothing was lost. This makes maintenance of digital artefacts feel less important. Mardon and Belk (2018) and Petrelli and Whittaker (2010) both found that the uniqueness of artefacts was an important element for their value, and their findings coincides with the participants observations.

To solve the problem of uniqueness in digital artefacts, there is an ongoing movement to create completely unique digital artefacts. The digital artefacts are called Non-Fungible Tokens (NFT), and are digital artefacts, which uses block-chain technology to create a unique token for the artefact. This token can be used to track the owner of the artefact and create a history for the digital artefact. This solves one of the problems with digital artefacts pointed out by Mardon and Belk (2018). The project is rather controversial, so as of the writing of this thesis it is not certain whether it is a success or not.

5.4 How age affects the view on physical and digital artefacts

One of the important research questions for this study was how age affected the participants' responses about their physical and digital artefacts. The participants were split into two age groups, and this exercise provided some interesting results. They indicated that there may be some differences in relations to artefacts, maintenance of them and how the differences between the digital and the physical are perceived.

5.4.1 The effect of age on relations to digital artefacts

Age was found to have little impact on why the participants cherished their physical artefacts, as there were only some minor differences in the reasoning for why the participants' artefacts were important to them. However, there was some interesting differences in the types of artefacts they cherished. Four of the eight participants in the age group under 30 had chosen physical artefacts which could be categorized as a "Memento", while only one participant in the age group over 30 did the same. A memento is a term for artefacts which are cherished for their ability to help the participants remember certain events or people. This points to the younger participants being more concerned with physical mementos than the older participants.

When it comes to why the participants cherished their physical artefacts, the only significant differences were in the importance of identity, uniqueness, and time or money invested in the artefact. In the age group under 30, none of the participants said that they cherished their physical artefacts because of how it was a part of their identity. In the other age group, two of the participants talked about the physical artefact as an important part of their identity. However, identity was a rather uncommon reason overall, so I cannot conclude on whether this is because of age or something else. There were also some differences in the amount of participants who reasoned that the time or money they invested into the artefact was an important reason for why it was important to them.

The age group under 30 were in general more focused on uniqueness, both when comparing the digital and the physical, and when sharing why their artefacts were important to them. They argued that even though there might exist copies of their physical and digital artefacts, the single copy they had was special. They would not necessarily replace them with an identical one. None of the older participants talked about uniqueness as a reason why their artefacts were important to them. This might indicate that the uniqueness of artefacts is more important to the younger participants.

A category which was not represented in the age group under 30 was “Places”. None of the participants in that age group chose to speak about a place as a cherished physical artefact. In the age group over 30, two of the participants chose to speak about a place as a cherished physical artefact. It is reasonable that places like cabins are more common in the age group over 30, as the participants under 30 are not established in the same way at a younger age. Most of the participants in the age group under 30 do not own an apartment or a cabin in the first place, due to differences in income and other resources. In 2017 only 13% of Norwegians in the age group 20-24 owned their own apartment or house compared to 67% for the 30-34 age group (Revolv, 2019). Ownership is important for the emotional value of artefacts (Gruning, 2017), which explains why they are less common as cherished artefacts.

As with the physical artefacts, there was a significant difference in the types of artefacts they cherished. Mementos was the most common type of digital artefact for both age groups, but there were more variety in the age group over 30. Every single participant in the age group under 30 spoke about a memento as a cherished digital artefact. The fact that mementos were a lot more common, both when it comes to physical and digital artefacts, in the age group under 30 points to them being more concerned with cherishing artefacts that help them remember different events and people. This points to there being a difference in how we care about and cherish mementos depending on age.

When it comes to digital artefacts, the reason for cherishing their artefacts was also different. Sentimental or nostalgic feelings was the most common reason for cherishing a digital artefact in both age groups, but there was still a larger occurrence of participants who cherished a digital artefact for sentimental or nostalgic reasons in the age group under 30. There were several minor differences between the two age groups in the other types of reasoning as well, and the most interesting of them were the time and money invested into the artefact. There was only a minor difference between the number of participants who reasoned that the time or money invested into the artefact was the reason why they cherished it. When the reasons for cherishing both physical and digital artefacts were combined, there was an indication that time or money invested into the artefact was more common with the older participants than the younger. This points to there being a significant difference between the age groups in how important the resources invested into the artefacts are.

5.4.2 The effect of age on maintenance of artefacts

There was no significant difference in how the participants maintained their artefacts when they were categorized by age. Both age groups put on average more effort into maintaining their physical artefacts than their digital artefacts. With the age group over 30 having one more participant than the age group under 30 who put more effort into the physical than the digital, the difference between the two groups was not large enough for it to be considered significant. A larger sample would be required to be able to measure whether there is a difference between the two age groups.

When it comes to the differences in effort the participants put into maintaining both of their artefacts, there was no significant difference between the two age groups either. Both groups had a similar distribution of participants who put a lot of effort into maintaining their artefacts and participants who put little to no effort into maintaining their artefacts. There were also two representatives from every age group in the category of participants who put more effort into maintaining and safekeeping their digital artefacts than their physical ones.

The lack of significant findings in this topic suggests that age is not a deciding factor for how people maintain and safekeep their physical and digital artefacts. It is likely that there are other personal traits which has a larger effect on how people maintain their digital and physical artefacts, but identifying these would require more research into the topic.

5.4.3 The effect of age on perception of physical versus digital

Based on the results from the interviews, there were some differences in how the participants perceived the digital and the physical. The first minor difference was in the categorization of the participants' leaning. Everyone who participated in the interviews either thought of the physical as superior to the digital or the two of them being equal. However, there might be a small difference in how large the participants think the gap between the physical and digital is. Both participants who were categorized as "Heavy leaning towards physical" were in the age group over 30. This category was defined by the participants having a large preference for the physical, where they also actively critiqued the digital. Both of the participants in this category actively spoke out against the digital, expressing a desire for it to be a smaller part of society. None of the participants in the age group under 30 expressed such a sentiment. They were in general a little more open to the digital. This suggests that there might be a small difference in the preference between the digital and the physical based on age, but the difference is not a large one. This might require additional research before it is possible to conclude.

There were also some differences in the topics the different age groups chose to discuss when they reflected on the differences. The age group under 30 was more focused on the topics of uniqueness of the artefacts and how there are differences in effort required to maintain them. None of the participants in the age group over 30 mentioned uniqueness, while only one participant in the same age group mentioned the differences in effort required to maintain digital and physical artefacts. This suggests that the younger participants are more concerned with uniqueness and maintenance than the older participants, and that these topics are more important to them when it comes to comparing the digital and the physical. In the age group over 30, they were a lot more concerned with the differences in functionality between the physical and the digital. This suggests that the functionality of

the artefacts is more important to the participants in the age group over 30. The other categories were somewhat even, with them being within one participant of each other.

When talking about effort, the participants in the age group under 30 discussed how they perceived digital artefacts as more secure and easier to maintain than physical artefacts. This was not necessarily a downside for physical artefacts, as the extra effort required to maintain them resulted in the participants often investing more time into them. The topics of effort into maintenance and uniqueness were closely connected for digital artefacts. Since digital artefacts are not unique in the same way as physical artefacts generally are, they do not need the same level of maintenance. It is a lot easier to create a brand-new identical copy of a digital artefact than of a physical artefact. This is the same sentiment as discussed in for example Mardon and Belk (2018), with how uniqueness can limit the potential emotional attachment to digital artefacts.

The older of the two age groups were more focused on functionality. They felt like the usage of the artefacts were more important, and that there were significant differences in functionality between physical and digital artefacts. One participant in the age group over 30 reported thinking of digital artefacts as something which limits social interactions. Another participant in the age group reported that they felt like the digital was associated more with functionality than the physical. They argued that we often kept digital artefacts because of what they could do for us, not necessarily for what they represent. With physical artefacts on the other hand, they were more accustomed to the idea of keeping artefacts with no functional use.

When the participants' comparisons of the physical and digital were sorted by age, it was possible to observe some potential generational differences in how we relate to the digital and the physical. This might point to an ongoing change in the perception of the physical and the digital between the generations. However, more data in this area is needed to be able to draw any definite conclusions about how age affects the perception of the digital and the physical, but it points to some interesting talking points for future discussion and research.

5.5 Self-perceived digital literacy

While not a part of the four research questions, an interesting find about the participants' technological habits and digital literacy came from the final question in the questionnaire. There, the participants were asked to rate how technologically literate they considered themselves compared to the general population. Every participant considered themselves to be average or better, with most of them considering themselves above average. There is a chance that every participant was average or better than the general population, but there is also a possibility that they perceive themselves as more technologically literate than they are. The difference between perceived digital literacy and actual digital literacy could be an interesting research topic for another study.

5.6 Case: Game save cartridge

One of the more interesting digital artefacts presented was the old save file from a *Pokémon Ruby*-game (Game Freak, 2002) (Figure 29). What is special about this artefact is that it is completely different from most of the other digital artefacts presented by the other participants. It also has some unique properties, which makes it more challenging to

maintain than many other digital artefacts.

Pokémon Ruby (Game Freak, 2002) was released in 2002 in Japan, and in 2003 for the rest of the world, for the Gameboy Advance console designed by Nintendo. *Pokémon Ruby* was the first game in the core series that introduced the third generation of Pokémon. Like every core series Pokémon game, the game is about catching Pokémon, which can then be leveled up and battled with. The game tells a "zero to hero"-story where the main protagonist gets their first Pokémon and progresses to become the strongest trainer ever. Along this journey there are several sub-plots which unfolds to make the journey more exiting, and results in the main protagonist having to save the world. There is a large variety of different types of Pokémon, and a large part of the game is collecting them all.



Figure 29: Pokémon Ruby-version (Game Freak, 2002) is an interesting case for a digital artefact (*Self-taken image*)

This digital artefact is something which could be categorized as a hybrid artefact (D. S. Kirk and Sellen, 2010), where there is a physical element in the cartridge and a digital element in form of the digital save file. The participant said during the interview that the save file of the game was the most important element of the digital artefact, as it was a save file they started around 15 years ago. They enjoyed booting up the game and look at what they were doing back then. However, the game *Pokémon Ruby* itself also holds some special meaning, due to it being their first experience with a Pokémon game and a fictional fantasy world. When describing their experience, the participant said: "When I got *Pokémon Ruby* for the old game boy, I got completely hooked. It has kind of stuck with me ever since". The game shaped their hobbies, and they still play and enjoy the new Pokémon games Nintendo releases every odd year to this day.

When it comes to safekeeping and maintenance, the Pokémon Ruby (Game Freak, 2002) game has some unique challenges compared to many other digital video games. The game cartridge contains a clock-battery, which is supposed to keep track of the time even when the game is not being played. This clock-battery is connected to core functionality in-game, where it is possible to for example grow berries. The problem is that after some time, the clock battery runs dry. This means that parts of the game stops working after a while. The game can still be played, but functionality like berry growing does not work.

This proposes some unique challenges when it comes to maintenance. This battery can be changed, but it is quite a risky endeavor. It involves opening the cartridge and soldering on a new battery. A mistake may end up destroying the entire game cartridge and make it unplayable. This would destroy the save file as well.

The participant who owned the game said that they did not do much to maintain it. It is mainly stored in a bag with the Gameboy Advance console and their other games. What makes this digital save file different from the digital artefacts presented by the other participants is that it cannot be copied and transferred like digital artefacts stored on a computer often can. This means that a Gameboy will always be the only way to access and interact with the digital artefact. Safekeeping is therefore essential to preserve the game. The participant said that they usually just kept it in the bag and trusted it to be safe there.

This digital artefact deals with many of the problems proposed in previous research about artefacts. Since it cannot be copied it is completely unique, which increases its emotional value. It also has a more distinct history with visible wear. The game reminds the player every time it is started up that the internal battery has run dry. It does not appear brand new like many other digital artefacts. These factors may help enhance the value of the digital artefact to its owner.

5.7 Validity concerns

Overall, the project has a high external validity. The findings are easily generalizable to a larger population. However, it is always important to remember that cultures and values may affect topics like the relationship to artefacts. Therefore, it is not generalizable on a worldwide basis, but we can safely assume that the findings are valid in a Norwegian culture.

The research also has a high face validity. The participants' responses and findings fit the research goal, and the participants provided accurate responses to the questions. Construct validity can be a problem, as there is little triangulation of the data. The interviews were transcribed, and the sound-files are still available, which means that the results can be traced through the analysis and back to the original interview. However, there are not several sets of data which are compared and triangulated to increase the validity of the findings. The interview is the main source, with the questionnaire mainly being used for inclusion-exclusion criteria and demographic information. Therefore, an effort has been made to use previous research to increase the validity of the findings.

Regardless, with any research project there are some potential validity concerns with the research that are important to be aware of. With any research project there are some validity and reliability concerns, and it is important to be aware of and handle them as well as possible. However, due to limited resources there were some potential extra concerns with the research that had to be considered when planning the research design.

5.7.1 Sample

The sample of any research project is important for its validity. For a study utilizing qualitative analysis methods, a sample size of 16 is sufficient to find valid qualitative results. This is also the case when the sample is split into two age groups of eight participants. The main issue is that there are situations where it is beneficial to increase the sample if there

are any interesting findings. Due to the lack of participants talking about identity as an important reason why they cherish their artefacts, it would be interesting to increase the sample to further investigate this finding. Especially due to the well-established idea in previous research that identity is an essential reason for why we cherish our physical and digital artefacts. By extending the sample it would be possible to increase the validity.

The chosen sampling method also has potential implications for the validity of the study. A snowball sampling strategy was chosen to recruit participants, which excels when there are issues with reaching participants. In retrospect, snowball sampling was the correct sampling method for this study due to the recruitment issues that was experienced in the latter half of the recruitment process. The main issue with snowball sampling is that the sample is not randomized, which means that there may be little variety in the sample. An example of how this can be problematic is the age groups. In the age group under 30, all of the participants were between 18 and 25 years old. There were no participants in the 26-30 age group or 31-35 age group. This means there was a 10 year age gap without any participants between the 18-25 age group and 36-40 age group. However, there were some upsides to this gap. Personality and views do not change overnight, which means that a 29-year-old does not necessarily change their opinions once they turn 30. The fact that there is at least a 10-year buffer between the youngest participant in the age group over 30 and the oldest participant in the age group under 30 increases the validity of the findings when it comes to differences by age. The age buffer increases the differences between the two age groups. Other than that, the sample was well balanced. There was a 50/50 split of male and female participants and the age group over 30 was somewhat spread across the age categories.

A concern with the validity and the sample is that the research was conducted in a single city, and a large part of the sample was affiliated with NTNU. This might affect the average level of technological literacy and the variety in socioeconomic status in the sample. This may have been indicated by every single participant perceiving their own technological literacy to be average or above average. Participants with a lower technological literacy may respond otherwise when asked about their physical and digital artefacts. It is possible that people with a higher technological literacy have different relationships with digital artefacts than people with a lower technological literacy.

5.7.2 Biases

As with any research project, it is important to be aware of potential biases. Biases may affect all stages of the research project, but awareness of them may help mitigate their effect on the findings. A researcher's job is to try to stay objective throughout the entire research process to ensure that the findings are as valid as possible. Confirmation bias is one of the common biases a researcher must be mindful of. For example, in this research project a lot of work was put into the literature review early in the research process. There, I was exposed to previous research about relations to physical and digital artefacts, and my opinions on the subject could be affected by these previous findings. This may create an expectation of what to find during the research project, which may shape how I responded to answers from participants during the interviews. I may have latched on to less important concepts presented by the participant due to this previous knowledge. This may have resulted in different follow-up questions and responses to the participants, which could shift the topic of the interview. In this research project, a lot of participants asked for examples of digital artefacts during the interview, as they did not completely understand the term. I chose to use digital images, old e-mails, old text

messages, or other files as examples to help the participants understand the term. This may have shaped the participants' answers, as they were reminded of their own digital images.

Selection bias is a common issue when recruiting a sample for a study. This is especially important when snowball sampling is used as a sampling method, as it is not a randomized sampling method. To deal with sampling bias, the researcher must be aware of why they recruit a specific participant and try to recruit a sample which is as varied as possible.

5.7.3 Reliability

In the interviews, the participants were asked to share and tell the researcher about one of their cherished physical artefacts and one of their cherished digital artefacts. Some participants mentioned several, but most of them mentioned only one artefact of each type. It was assumed that the artefacts the participants shared were their most valued ones, but there is a possibility that the most valued cherished artefacts differ from their other cherished artefacts. The other cherished artefacts could possibly vary from the participants' most cherished artefacts in both type and reason for why they are cherished. This means that the research project may not actually measure the participants' relations to their artefacts in general, only their relations to their most cherished artefacts.

6 Conclusion

As our society develops and we become more accustomed to technology and the digital, our relations to the digital changes and evolves. It has for many decades been known that what we have is an important part of who we are, but does this also apply to the digital? These are questions we need to be able to answer to be able to find new design solutions for digital artefacts to make them more valuable to their owners and users.

In this research project I looked at human relations to digital artefacts by comparing them to the physical artefacts we all have and cherish. This topic has been explored through four research questions:

- RQ1: What relations do people have to their digital artefacts, and how does this differ from their relations to their physical artefacts?
- RQ2: How do people maintain their digital artefacts, and how does this differ from how they maintain their physical artefacts?
- RQ3: What do people think about the difference between digital and physical artefacts and how one relates to and maintains them?
- RQ4: How does age affect the answer to the three previous research questions?

Through interviews, the 16 participants have shared their cherished physical and digital artefacts, how they maintain them, and what they think of the digital compared to the physical. These interviews have been analyzed using qualitative analysis methods, and coded depending on type of artefact and reason for cherishing it.

6.1 Research question 1

For research question 1, a lot of the findings had similar results as previous research in relations to physical and digital artefacts. It was found that there was no significant difference between digital and physical artefacts when it comes to emotional attachment. Emotional attachment was as important for digital artefacts as it was for physical artefacts, and was common for both. Most participants reported sentimental or nostalgic feelings as the main reason why they cherished a chosen artefact, which proves the significance of emotional attachment. Functionality and time invested into the artefact was a lot more important for physical artefacts than digital ones. There was less variety in the types of digital artefacts than in physical artefacts, which suggests that physical artefacts may still be more common than digital artefacts, even though they are equally important once they reach the status of cherished. Previous research suggested that identity was the most important part of both physical and digital artefacts, but the topic garnered little attention from the participants when discussing their artefacts. This may suggest that most people do not think of their identity when they think about why an artefact means a lot to them.

6.2 Research question 2

When it comes to maintenance of digital and physical artefacts, it was found that there were some significant differences in how the participants cared for their artefacts. The

largest difference was in how they did it. For physical artefacts, the participants initiated both proactive and reactive measures to ensure the artefacts' safety and preservation. However, For digital artefacts there were very few reactive measures. The effort went more into safekeeping than maintenance of the artefacts. The participants did what they could to protect the digital artefacts from harm, but they had very few options should something they were not prepared for happen. Several copies of the digital artefacts in separate locations were the most common method for safekeeping digital artefacts.

The effort the participants put into the artefacts were in general skewed towards physical artefacts. It was therefore found that people in general put more effort into maintaining their physical artefacts, but it depends on the person. There were several participants who put more effort into maintaining their digital artefact than their physical. Many participants said that the difference in effort put into maintenance was because they trusted the digital systems that contained their digital artefacts to take care of them. They expected maintenance of their digital artefacts to happen automatically.

6.3 Research question 3

For people's perception of the digital and physical in research question 3, it was found that most people still think that the physical is superior to the digital. There are some who think they are equal for various reasons, but they are a minority. There was not found any signs of any participants preferring the digital over the physical. The participants thought that they had different strengths and weaknesses, but they still overall preferred the physical.

It was found that the most important difference between physical and digital objects were their material properties. Digital objects cannot be touched and interacted with in the same ways as physical artefacts can, and this was the main reason why they will never be equal in many of the participants' eyes. The participants in general agreed with the sentiment that physical and digital artefacts are similar when it comes to emotional value and attachment, but this was not enough to make them equal. It would feel as bad to lose a digital artefact as a physical artefact, which was an argument from some of the participants for why they must be equal. Fleetingness and uniqueness were also found to be areas where the physical was superior to the digital. The fact that digital artefacts could often be easily copied made them feel less valuable to the participants than their physical counterparts. These are problems that need to be solved if we want digital objects and artefacts to be as valuable as physical ones.

6.4 Research question 4

The final research question covers how age affects the previous research questions. The sample was split in half by age, where eight participants were older than 30 years old and eight participants were younger than 30 years old. These age groups were then compared in the analysis of the data.

6.4.1 Age and research question 1

It was found that there was a difference in the types of artefacts the two age groups cherished. Mementos and other memorabilia were a lot more common with the younger

participants, both with physical and digital artefacts. The younger participants cherished their digital artefacts for sentimental or nostalgic feelings more than the older participants, while the older participants were more concerned with the time or money invested into the artefacts. The older participants were also more concerned with identity and how an artefact was a part of their identity, but this was an uncommon reason for this age group as well.

6.4.2 Age and research question 2

There was not found any significant difference between the age groups when it comes to maintenance and safekeeping of their physical and digital artefacts. Both age groups had close to a similar number of participants who put more effort into maintenance of their physical artefacts, digital artefacts, and equal effort into both. There were participants who put little to no effort into maintaining both of their physical and digital artefacts in both age groups. This was also the case with participants who spent a massive amount of effort to maintain both their physical and digital artefacts. The effort put into maintaining the artefacts were dependent on other individual factors than age.

6.4.3 Age and research question 3

With the individual age groups' perception of the physical and the digital, there was data which suggested that the older participants may lean slightly more towards the physical than the younger participants. It was also found that the younger participants were more focused on the uniqueness of their artefacts and how easy they were to maintain. The older participants' on the other hand, were more concerned with the functionality of the artefacts. Both age groups were able to see positives and negatives with both the physical and the digital, and they all agreed that they had their strengths and weaknesses which could be relevant for different situations.

6.5 Further work

During this research project, there has been some findings that need more research and data before it is possible to conclude. In this chapter, I will suggest some topics which could be interesting for future research into how we relate to digital artefacts.

The first and most controversial result of this study was the fact that the participants did not think of identity as an important reason why they cherished their artefacts. Because of the importance of identity in previous research, this topic needs further research to ensure validity. There are several possible reasons why the participants may not have thought of identity as a reason for why they were cherishing their artefacts, and more research is required to properly identify these.

There were some interesting findings when it comes to the age of the participants and their physical and digital artefacts. They suggest that there is a difference in how we relate to our artefacts based on our age. It would be interesting for more research into this topic to further explore these differences and try to identify why they exist.

There was a small indication that there may be a correlation between digital literacy and digital artefacts. This correlation was not properly explored in this study, and it

would need a more specialized research study into this to be able to explore this possible correlation.

Finally, every participant responded in the questionnaire that they perceived their digital literacy to be at least average or better compared to the rest of the population. This is an interesting phenomenon, and it may be fascinating to explore the differences between self-perceived digital literacy and actual digital literacy.

Overall, there are still much to be discovered within the field of digital artefacts and how we relate to them. More research into the general topic and more data would help triangulate the findings in this study and other previous research, which would be beneficial to the field.

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Appendix

A Interview guide (Norwegian)

”Relasjoner vi har til digitale artefakter”

Intervjuguide:

1. Kan du beskrive en fysisk ting som betyr mye for deg?
2. Hva er historien bak denne tingen?
3. Hvorfor er den spesiell for deg?
4. Hvordan tar du vare på denne tingen?
5. Kan du beskrive en heldigital ting/objekt som betyr mye for deg? Dette kan for eksempel være e-poster, bilder, filer eller videospillkarakterer.
6. Hva er historien bak denne tingen?
7. Hvorfor er den spesiell for deg?
8. Hvordan tar du vare på denne tingen?
9. Hva tenker du om forskjellen mellom hvordan vi forholder oss til fysiske og digitale ting?

B Interview guide (English)

“Relations we have to digital artefacts”

Interview guide:

1. Can you describe a physical thing which means a lot to you?
2. What is the story behind this thing?
3. Why is it special to you?
4. How do you maintain this thing?
5. Could you describe a digital thing/object which means a lot to you? This can for example be e-mails, images, files, or video game characters.
6. What is the story behind this thing?
7. Why is it special to you?
8. How do you maintain this thing?
9. What do you think about the difference between how we relate to physical and digital things?



SPØRRESKJEMA

Relasjoner vi har til digitale artefakter

Kartlegging av teknologibruk.

1) Alder

- 18- 25 26- 30 31- 35 36- 40 41- 45
 45- 50 51- 55 56- 60 61- 65 66+

2) Kjønn

- Kvinne Mann Annet

3) Har du egen mobiltelefon?

- Ja Nei

4) Hvor ofte bruker du din mobiltelefon?

- Flere ganger om dagen
 En gang om dagen
 Annenhver dag
 En gang i uka
 Aldri

5) Hva bruker du din mobiltelefon til?

(sett flere kryss om aktuelt)

- | | |
|--------------------------------------|--|
| <input type="checkbox"/> Ringe | <input type="checkbox"/> Meldinger (SMS, Messenger) |
| <input type="checkbox"/> Kalender | <input type="checkbox"/> Se på video (Youtube, TikTok) |
| <input type="checkbox"/> Klokkealarm | <input type="checkbox"/> Spille spill |
| <input type="checkbox"/> Internett | <input type="checkbox"/> Sosiale medier (Facebook, etc.) |
| <input type="checkbox"/> Annet | |

Av Thomas Øiseth 2021



6) Har du en datamaskin med tilgang til internett hjemme?

- Ja Nei

7) Bruker du internett via datamaskin på noen av følgende steder: (sett flere kryss om aktuelt)

- På jobb
 På universitetet/skolen
 På kafe', restaurant el. hotell som har internettoppkobling
 Annet sted: _____

8) Hvis du bruker internett, hva bruker du det til?

(sett flere kryss om aktuelt)

- Lese nettavis
 Surfe på internett
 Bestille billetter (f.eks flybilletter, kinobilletter via internett)
 Netthandel (f.eks kjøpe bøker, via internett)
 Chatte (snakke skriftlig over internett)
 Sosiale medier (som f.eks Facebook, Twitter)
 Nettbank (bruke banktjenester over internett)

9) Hvis du bruker internett, hvor ofte bruker du det?

- Flere ganger om dagen
 En gang om dagen
 Annenhver dag
 En gang i uka
 Aldri

10) Hvor datakyndig betrakter du deg selv? (Svært datakyndig = 5, Ikke datakyndig = 1)

- 1 2 3 4 5

Takk for at du tok deg tid til å fylle ut spørreskjemaet!

D Raw data from questionnaire

Participant:	1) Age	2) Gender	3) Phone	4) Phone usage
1	18-25	Male	Yes	Multiple times a day
2	18-25	Female	Yes	Multiple times a day
3	66+	Female	Yes	Multiple times a day
4	36-40	Female	Yes	Multiple times a day
5	36-40	Male	Yes	Multiple times a day
6	51-55	Female	Yes	Multiple times a day
7	51-55	Female	Yes	Multiple times a day
8	41-45	Male	Yes	Multiple times a day
9	18-25	Male	Yes	Multiple times a day
10	18-25	Female	Yes	Multiple times a day
11	18-25	Male	Yes	Multiple times a day
12	51-55	Female	Yes	Multiple times a day
13	41-45	Male	Yes	Multiple times a day
14	18-25	Male	Yes	Multiple times a day
15	18-25	Male	Yes	Multiple times a day
16	18-25	Female	Yes	Multiple times a day

The participants answers to the questions about age, gender, if they have a phone and how often they use it

Participant:	Call	Messages	Calendar	Watch videos
1	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes
6	Yes	Yes	Yes	Yes
7	Yes	Yes	Yes	Yes
8	Yes	Yes	Yes	Yes
9	Yes	Yes	Yes	Yes
10	Yes	Yes	Yes	Yes
11	Yes	Yes	No	Yes
12	Yes	Yes	No	Yes
13	Yes	Yes	Yes	Yes
14	Yes	Yes	Yes	Yes
15	Yes	Yes	Yes	Yes
16	Yes	Yes	No	Yes

The participants answers when asked what they use their phone for. Part 1/2

Participant:	Alarm	Play games	Internet	Social media
1	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes
3	Yes	No	Yes	Yes
4	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes
6	Yes	Yes	Yes	Yes
7	Yes	No	Yes	Yes
8	Yes	No	Yes	No
9	Yes	No	Yes	Yes
10	Yes	No	Yes	Yes
11	Yes	Yes	Yes	Yes
12	Yes	Yes	Yes	Yes
13	Yes	No	Yes	Yes
14	Yes	Yes	Yes	Yes
15	Yes	Yes	Yes	Yes
16	Yes	No	Yes	Yes

The participants answers when asked what they use their phone for. Part 2/2

Participant:	Computer	At work	At university/school	At cafés etc.	Others:
1	Yes	No	No	No	Yes
2	Yes	Yes	Yes	Yes	No
3	Yes	No	No	Yes	No
4	Yes	Yes	No	Yes	No
5	Yes	Yes	No	No	No
6	Yes	Yes	No	No	No
7	Yes	Yes	No	No	No
8	Yes	Yes	Yes	No	Cabin
9	Yes	Yes	Yes	No	Yes
10	Yes	Yes	Yes	Yes	No
11	Yes	Yes	Yes	No	Yes
12	Yes	Yes	No	Yes	No
13	Yes	Yes	Yes	Yes	No
14	Yes	Yes	Yes	Yes	No
15	Yes	Yes	Yes	Yes	No
16	Yes	Yes	Yes	Yes	No

The participants answers when asked if they have a computer and where they use it

Participant:	Reading paper	Surfing	Ordering tickets	Shopping
1	Yes	Yes	Yes	Yes
2	No	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes
6	Yes	Yes	Yes	Yes
7	Yes	Yes	Yes	Yes
8	Yes	Yes	Yes	Yes
9	Yes	Yes	Yes	Yes
10	Yes	Yes	Yes	Yes
11	Yes	Yes	Yes	Yes
12	Yes	Yes	Yes	Yes
13	No	Yes	Yes	Yes
14	Yes	Yes	Yes	Yes
15	Yes	Yes	Yes	Yes
16	Yes	Yes	Yes	Yes

The participants answers when asked what they use the internet for. Part 1/2

Participant:	Chatting	Social media	Banking
1	Yes	Yes	Yes
2	Yes	Yes	Yes
3	Yes	Yes	Yes
4	Yes	Yes	Yes
5	Yes	Yes	Yes
6	Yes	Yes	Yes
7	Yes	Yes	Yes
8	Yes	No	Yes
9	Yes	Yes	Yes
10	Yes	Yes	Yes
11	Yes	Yes	Yes
12	Yes	Yes	Yes
13	Yes	Yes	Yes
14	Yes	Yes	Yes
15	Yes	Yes	Yes
16	Yes	Yes	Yes

The participants answers when asked what they use the internet for. Part 2/2

Participant:	9) Internet usage	10) Perceived digital literacy (1 to 5)
1	Multiple times a day	5
2	Multiple times a day	4
3	Multiple times a day	4
4	Multiple times a day	4
5	Multiple times a day	4
6	Multiple times a day	3
7	Multiple times a day	4
8	Multiple times a day	5
9	Multiple times a day	3
10	Multiple times a day	3
11	Multiple times a day	5
12	Multiple times a day	3
13	Multiple times a day	5
14	Multiple times a day	4
15	Multiple times a day	5
16	Multiple times a day	3

The participants answers when asked how often they use their internet and their own perceived digital literacy. For digital literacy, a 1 is low below average and a 5 is high above average

