Using Digital Layers to Evoke Nostalgia in Hybrid Gifting

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"Digital is the means, not the end. Technology sometimes obscures this ultimate truth, and makes it easy to forget that at the far side of an app, a Tweet, an anything, there's a person"

- Ahmed and Olander (2012)

Abstract

We accumulate vast physical and digital possessions throughout our lives, making it difficult to organise, share, and reflect on amassed repositories. The increased availability of capture has resulted in some deliberately capturing media with the aim to one day reflect and feel nostalgic. Nostalgia involves a range of bittersweet emotions including joy, loneliness, and regret. Yet, it remained unclear if and how nostalgic media could potentially be repurposed or re-framed as a gift.

Gifting is a social ritual and typically involves the transfer of a physical gift item or product. An emerging modality of gifting entitled 'Hybrid Gifting' is defined as blending physical and digital objects to create a single gift. This thesis focuses on hybrid gifting but with a specific angle to explore nostalgia. Despite thematic links of social bonds, communication, and relationships there remained a notably absent research gap in bringing together the areas of gifting, technologies, and emotions.

The primary aim of this thesis was to explore if a hybrid gifting modality could facilitate nostalgic experiences and uncover the unique perspectives of those involved in a gift exchange: gift-givers, gift-recipients, and gift-producers.

This research took a multidisciplinary approach and was underpinned by areas of marketing, consumer research, psychology, anthropology, and human-computer interaction. A range of qualitative methods were adopted to explore the research aims and perspectives: interviews, focus groups, technology probes, and reflexive thematic analysis.

This thesis is made up of four main studies and is the first to combine embedding

nostalgic emotions within a hybrid gifting modality. The first study entitled 'The Memory Machine' explores the concept of transforming media and memories into a digital gift from a gift-giver perspective. The second study entitled 'The Nostalgic Gifting Study' aimed to understand how a hybrid gift could help facilitate nostalgic experiences and the implications of trying to evoke nostalgia through personal digital media for both gift-giver and receiver. The third study entitled 'The Tailored Gifting Study' aimed to explore: "Can physical and digital objects combine to create a nostalgic narrative? And if so, how does this happen in a hybrid gift exchange?" Lastly, the fourth study entitled 'The Gift Producer Study' aimed to understand gift producer opinions on the potential challenges and opportunities of creating hybrid gift products.

The contributions of this work are both theoretical and practical. Firstly, the theoretical contributions relate to four unique areas: **(1) Bittersweet nostalgia facilitated by hybrid gift exchange:** which involves a definition of nostalgic hybrid gifts, an understanding of how nostalgic emotions can be evoked in hybrid gift exchanges, and any impacts of this. **(2) The role of objects in hybrid gift exchanges:** which involves a unique understanding of physical objects in hybrid exchanges and the affordances of blending physical and digital objects in an exchange: a memorable exchange, psychological benefits, ongoing connections, and multi-sensory presentation. **(3) Technologies and hybrid gift:** which outlines specific knowledge on the use of QR codes in hybrid gift exchanges, gift producer views on technologies for hybrid product design, and how technologies enable communication via hybrid modality. **(4) Meaningful relationships:** which highlights the types of motivations gift-givers have for gifting a memory, the roles of the gift-giver, recipient, and producer, and the impact on relationships of sending/receiving a hybrid gift.

Moreover, there are three practical design implications of this work. Firstly, 'rituals and technologies' suggests a considered use of technology to enhance social rituals and highlights the importance of balancing tradition and evolution when designing

in the rituals space. Secondly, 'blended experiences and emotional possibilities' encourages contemplation of aesthetic design, layering of media, and the emotional possibilities when physical and digital objects are matched. Finally, 'designing with nostalgia' outlines the subjective challenges of designing with or for nostalgia but also how themes, prompts, and inspiration can be used to guide consumers/participants to create nostalgic narratives.

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List of Publications

A number of publications have been published based on this PhD work with some directly correlating to chapters of this thesis:

Gibson, R., Koleva, B., Flintham, M. and Winklhofer, H., 2023, July. Gifting the Past in the Present: An Exploration of Evoking Nostalgia through Hybrid Gifts. In Proceedings of the 2023 ACM Designing Interactive Systems Conference (pp. 1047-1059). **Presented in chapter 5: The Nostalgic Gifting Study**

Gibson, R., Babbage, C.M., Wagner, H.G., Price, D.J., Martindale, S., Chadborn, N.H., Ito-Jaeger, S., Darzentas, D.P., Webb, H., Jacobs, R. and Atabey, A., 2023, July. "It's not just for the Past but it's for the Here and Now": Gift-Giver Perspectives on the Memory Machine to Gift Digital Memories. In Proceedings of the 2023 ACM Designing Interactive Systems Conference (pp. 987-1001). **Presented in chapter 4: The Memory Machine Study**

Gibson, R., 2021, June. Using Digital Layers to Evoke Nostalgia in Hybrid Gifting. In Companion Publication of the 2021 ACM Designing Interactive Systems Conference (pp. 5-6).

Other research conducted in line with this PhD: Spence, J., Koleva, B., Benford, S., Darzentas, D., Flintham, M., Glover, K., Wagner, H., Gibson, R. and Thorn, E., 2023. "More than a cliché": Experiencing Hybrid Gifting in the Wild. ACM Transactions on Computer-Human Interaction.

Spence, J., Koleva, B., Flintham, M., Thorn, E., Glover, K., Gibson, R., Benford,

S.D., Kwon, H., Darzentas, D.P. and Wagner, H.G., 2023, June. C+C Festival of Hybrid Gifting. In Proceedings of the 15th Conference on Creativity and Cognition (pp. 8-12).

Chapter 1

Introduction

This thesis touches on several disciplines including human-computer interaction, psychology, anthropology, and consumer research. The topics this thesis targets are gifting, nostalgia, and technology. The main focus for this work is within the technology-mediated reflection space and **the specific topic of this thesis is nostalgic hybrid gifts**. Hybrid gifting is defined as blending physical and digital objects to create a single gift. Specifically, this work explores evoking nostalgic memories and emotions via a hybrid gifting modality.

Memories are documented and cued in various formats. For example, serendipitously hearing a song can transport one back to childhood, or some may (sub)consciously scroll through smartphone camera rolls reminiscing on images and videos from lived experiences. Over the decades, the task of capturing, storing, and revisiting media via smartphones has become the norm (Chopra-Gant 2016; Denegri-Knott, Jenkins, and S. Lindley 2020; Moschovi and Galani 2013; Kirk, Sellen, et al. 2006). Moreover, this means personal digital repositories have grown, making the management of virtual possessions difficult (Vitale, Odom, and McGrenere 2019). A further challenge for users of amassing large volumes of personal media is the lack of understanding and practical approaches to sharing media with others in a meaningful, personal, and curated way.

Media, possessions, and memories can be classed as meaningful because they evoke emotions and serve as valuable reminders of the past (André et al. 2011; Van den Hoven, Orth, and Zijlema 2021). Notably, **some media is now captured pre-emptively with the aim to one day reflect and feel nostalgic** (Cheung et al. 2020). Nostalgia is a set of bittersweet emotions and can involve elements of joy, empathy, loss, regret, and longing (Batcho , Krystine Irene 2013; Wildschut, Sedikides, et al. 2006; Holak and Havlena 1992). When nostalgic emotions are shared, they promote social benefits such as bonding, closeness, and relational signalling (Alea and Bluck 2003). Despite the prominence of nostalgic media and memories, it remains unclear if and how they could be transferred within close interpersonal relationships. One option to explore this concept is the gifting ritual due to emerging modalities that include personal media as part of a gift.

Gifting is defined as *"something given without receiving payment, often in the expectation of reciprocation and of changing the relationship with the recipient"* (Davies et al. 2010) (p.414). Gifts typically include a wrapped up physical object and are transferred from gift-giver to recipient (Ruffle 1999; Galak, Givi, and Williams 2016). Having said that, innovation in more recent decades has transformed the gifting ritual into digital formats. Digital gifting is defined as *"intangible digital objects that are intentionally exchanged as gifts online and in digital formats, not bound to physical containers"* (Kwon et al. 2017) (p.2372). Digital gifts can range from charitable donations to online gift vouchers for retailers. Despite being a convenient modality to send and receive gifts (Kizilcec et al. 2018), Kwon et al. (2017) highlight how **digital gifts can lack visible effort and sentiment**. Moreover, some argue that digital content can only be shared as opposed to gifted (R. Belk 2010; Giesler 2006; Golsteijn et al. 2012). Aside from digital gifting, **the gifting ritual has remained largely untouched in terms of digital innovation**, however Koleva et al. (2020) proposed a new hybrid gifting modality to combine both physical and digital objects into a single gift. Yet, it remains unclear how this hybrid modality could evolve and what social purposes it could serve within interpersonal gift exchanges.

To summarise, this thesis is mainly situated in the technology-mediated reflection space and looks into areas of gifting, technologies, and nostalgia. Four exploratory studies are set out which highlight the unique experiences and perspectives of the gift-giver, recipient, and producer. Whilst this thesis does not address a specific *problem*, it attempts to understand how growing nostalgic digital repositories may be repurposed within hybrid gift exchanges. The main aims of this thesis are summarised in the following section.

1.1 Research Questions

The overall aim of this thesis is to **uncover if and how nostalgia can be evoked within a hybrid gifting modality and the implications of this from gift-giver, recipient, and producer viewpoints**. To attain this goal, the following three research questions are explored throughout this thesis:

1. What are the considerations for embedding or evoking nostalgia in a hybrid gift exchange?
2. What are the variations of nostalgic digital layers and does altering components like the type of media impact the experiences of gift-giver and recipient?
3. What are the roles and perspectives of the gift-giver, recipient, and producer within hybrid gift exchanges?

Each research question contributes towards achieving the overall aim of the thesis and is underpinned and explored via sub-questions contained within each study.

1.2 Thesis Outline

This section sets out the structure of this thesis. In total, the thesis contains nine chapters, four of which detail the studies undertaken to address the research questions. All presented studies gained ethical approval from the School of Computer Science Ethics Committee. An overview of this thesis can be viewed in Figure 1.1.

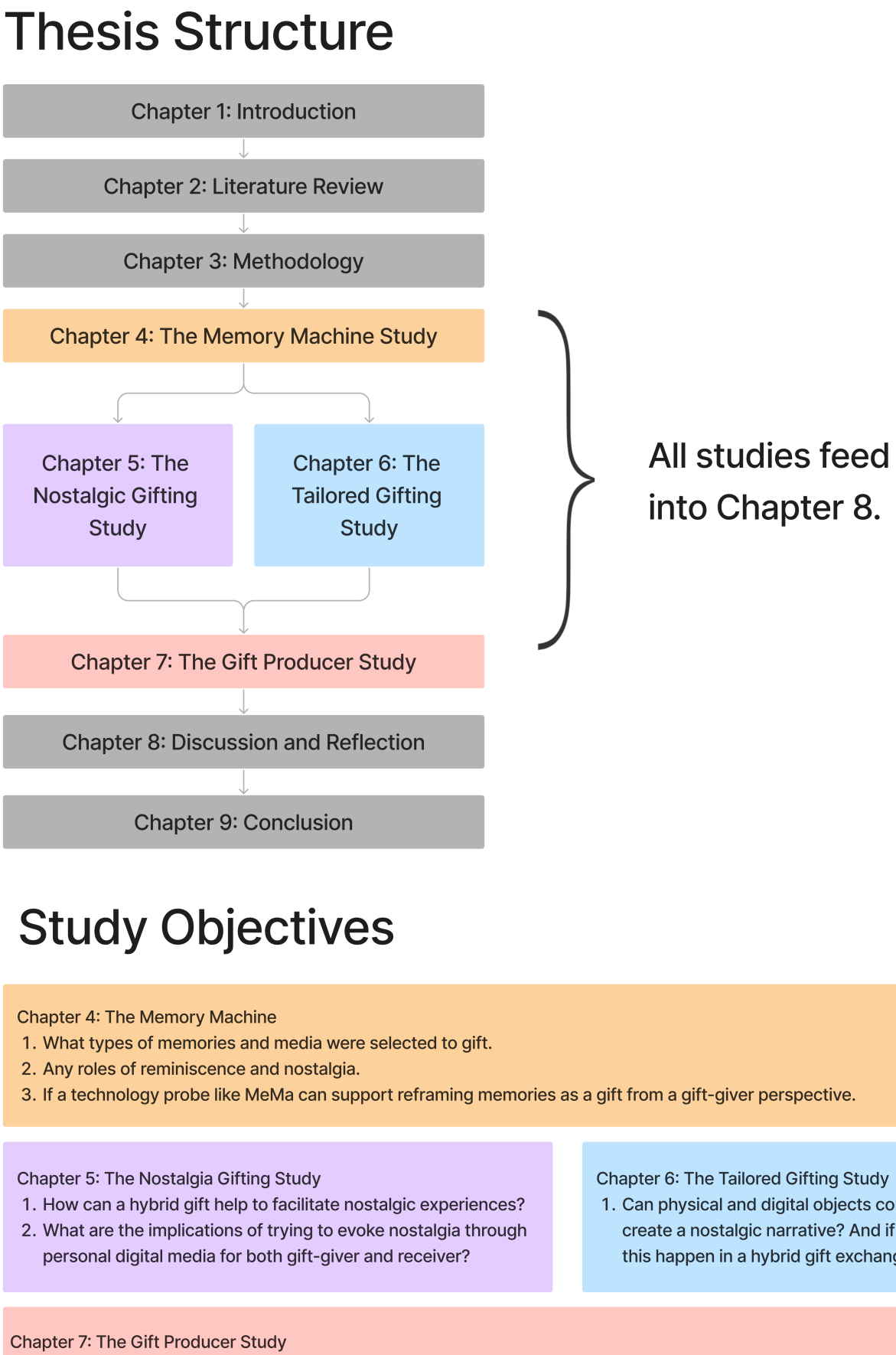


Figure 1.1: Structure of the thesis

Chapter 2- Literature Review: Due to the multi-disciplinary nature of this work, the literature review takes a topical approach to present relevant works within anthropology, marketing, human-computer interaction, and psychology. Each section within this chapter outlines relevant theories, debates, and arguments in different areas relating to gifting, rituals, technologies, hybridity, relationships, nostalgia, and memories. The chapter closes with a summary of identified research gaps that this thesis aims to address. It should be noted that whilst this chapter highlights the key underpinnings and basis for the presented studies, related literature is briefly set out within each chapter.

Chapter 3- Methodology: This chapter explains the chosen approaches to exploring the research questions. It begins with an overview of studies, their methods, and how they link together. Following this, qualitative methods of data capture and analysis are highlighted. The chapter then presents the configurations used for the four main studies of this thesis and discusses the rationale of the methodological choices. The chapter closes with a summary of the main methods and approaches used throughout the studies. The chapter aims to present an overview of methods, however, each study will present in-depth details such as recruitment methods, participants, and ethical considerations.

Chapter 4- The Memory Machine Study: This chapter reports the first of four studies. The study of the Memory Machine (MeMa) involved a dedicated device to explore gift-giver perspectives on the concept of gifting digital memories, to better inform hybrid modalities and ways of gifting. To clarify MeMa was a project with a multidisciplinary team, however my involvement on the project was to lead the gifting angle of the work and I was responsible for all data analysis, gifting study design, and writing up of the MeMa work. MeMa is the basis for this thesis and is the first study to bring nostalgia and gifting together. The chapter outlines the design of MeMa, the qualitative approach for exploration, and findings from a reflexive thematic analysis process. A discussion section then highlights the implications of the findings such as the importance of having something tangible within a gift

exchange or having a cue to guide participants through the selection process of gifting a media-memory. The chapter concludes with a summary of themes, considerations, questions, and opportunities that arose from the study of MeMa which then leads into the following chapters.

Chapter 5- The Nostalgic Gifting Study: Based on the study of MeMa and extant literature, the Nostalgic Gifting Study set out to explore the exchange of nostalgic emotions via hybrid gifting modality. Pairs of gift-givers and recipients took part in the interview study, who created gifts that contained a physical chocolate box and a digital personal nostalgic memory. The chapter outlines the in-the-world approach and sets out how gifts were created and sent to participants whilst also outlining the rationale for the physical gift, QR codes, and media. The findings from reflexive thematic analysis are presented in turn from gift-giver and recipient viewpoints. A discussion then brings together key implications of this study via the roles of gift-giver, recipient, media, nostalgia, and hybridity and how these roles impact the five-stage gift exchange model by Kwon et al. (2017). The chapter ends with a summary of the key takeaways from the study such as an expanded definition of nostalgic hybrid gifts, whilst also outlining remaining knowledge gaps on the hybrid gifting modality with respect to how versatile they may be.

Chapter 6- The Tailored Gifting Study: This chapter builds upon the previous studies outlined within the thesis. The Tailored Gifting Study aimed to address types of physical gifts that could be paired with digital nostalgic memories whilst affording the gift-giver more freedom over the media types they could use. The chapter begins by outlining relevant literature and previous findings to set out the motivation for the study. The process for creating gifts is then outlined with an explanation of how data was thematically analysed. The findings present three themes and the discussion section outlines in-depth the Preparation, Reveal, and Reflection stages involved in a tailored hybrid gift exchange. The chapter closes with a summary of the key takeaways from the study including how objects connect in hybrid exchanges.

Chapter 7- The Gift Producer Study: This chapter brings together findings and knowledge from chapters 4, 5, and 6 to discuss the concept of nostalgic hybrid gifts with gift producers. The chapter begins by outlining the motivation, approach, and objectives for the study. Following this, the focus group design, overview of participants, ethical considerations, and data collection and analysis methods are presented. The findings from thematic analysis and a nominal group technique are presented. The discussion highlights specific design recommendations for producers or designers interested in the hybrid gifting space. The chapter then closes with a summary of the key takeaways.

Chapter 8- Discussion and Reflection: This chapter brings together findings from all four studies and is split into two main sections. The first part outlines the unique theoretical contributions which relate to the place of nostalgia, objects, technologies and relationships within hybrid gift exchanges. Following this, the second part sets out three design implications based on this work for researchers, designers, and producers which focus on designing technologies to support rituals, blended experiences and emotional possibilities, and designing with nostalgia. The chapter is then closed with a summary of the theoretical and practical implications of this thesis.

Chapter 9- Conclusion: This final chapter summarises the work conducted throughout this thesis. The chapter begins with a summary of all four research studies and discusses the importance and relevance of each. Secondly, the chapter outlines the theoretical contributions and design implications of the thesis. Thirdly, the research questions are addressed and answered. Fourthly, a critical reflection presents limitations of the work. This chapter and thesis then closes with a summary of what the hybrid gifting landscape may look like in the future and highlights potential areas for future research.

1.3 Contribution Statement

It is anticipated that this work may be useful for researchers in the space of technology-mediated reflection or interaction design and for those working within the gifting industry who create or design gifts. The main contributions of this thesis are categorised as theoretical and design implications. Firstly, the unique theoretical areas of this thesis are summarised as follows:

Bittersweet nostalgia facilitated by hybrid gift exchanges: This thesis has extended the existing knowledge of hybrid gifts to contribute a definition of *nostalgic* hybrid gifts. This includes an understanding of how nostalgic emotions are associated within hybrid gift exchanges and the impacts this can have on gift-giver and recipient relationships.

Objects in hybrid gift exchanges: This research extends previous debates and discussions around the merging of physical and digital objects to craft new experiences. For example, this thesis contributes an understanding of how gifting can give *'form'* to a collection of media, the roles of physical products in hybrid exchanges, and uncovers new affordances of merging physical and digital objects as a gift.

Technologies and hybrid gifts: This thesis contributes to new knowledge around using QR codes on physical products and specifically ways of using technology to communicate via hybrid gift exchanges. Further, this thesis has uncovered a new understanding of technical concerns and opportunities from the unique gift producer perspective.

Meaningful relationships: This thesis extends discussions on the place of relationships within gift exchanges. Specifically, this research has uncovered a new understanding of the motivations for gifting memories, the roles involved within a hybrid gift exchange, and the impacts that hybrid gifting can have on relationships.

Based on the theoretical contributions the following three design considerations are set out which have been developed from the studies throughout this thesis. The

design considerations are for researchers, gift-producers, or those interested in the technology-mediated reflection space:

Rituals and technologies: This implication considers practical ways of designing for existing rituals which involve seamless, ambient, and thoughtful uses of technology to enhance social rituals.

Blended experiences and emotional possibilities: This implication relates to layering different media types to increase emotional appeal and afford a vivid multi-sensory blended experience.

Designing with nostalgia: This consideration focuses on nostalgia and elaborates on key points such as there is no 'one-size-fits-all' approach to designing with nostalgia yet, prompts, themes, examples, and inspiration can be presented to guide or help participants craft their nostalgic narratives.

The contributions of this work extend discussions, debates, and knowledge in the areas of objects, relationships, nostalgia, and technologies within hybrid gift exchanges. Further, the unique design considerations highlight important areas of nostalgic hybrid gifts for researchers, designers, or gift producers to target in future work. The following chapters will outline related work and new research conducted for this thesis to demonstrate how these conclusions and contributions were conceptualised.

Chapter 2

Literature Review

This chapter outlines key definitions, concepts, and theories. The aim is to establish the underpinnings of the thesis and uncover any debates, questions, and research gaps. The chapter is split into three themes.

The first theme of gifting explores social exchange theory and elaborates on the gifting ritual. Following this, the different types of exchanges (physical, digital, and hybrid) are defined alongside the materials that can be comprised to make up a gift. Further, this theme summarises the impacts gifts can have on relationships, following this, various studies that investigate other rituals like Christmas and grieving are explored to understand how to undertake research involving rituals like gifting.

The second theme of technologies and hybridity within HCI and highlights merging physical and digital materials in a range of settings. Further, technologies such as QR codes, RFID tags, and Augmented Reality are evaluated to understand how they specifically may be used within hybrid gift exchanges. This theme concludes by outlining current uses of technologies within relationships.

The third and final theme focuses on nostalgia and memories. This begins with defining nostalgia including types of emotions, experiences, and triggers. Subsequently, human memory types are outlined and the relationships between media and technology-mediated reflection are discussed. Lastly, consumer research and

marketing fields are used to understand the wider applications of nostalgia within a commercial setting.

The structure of each theme will start broadly to define key concepts such as gifting, hybridity, or nostalgia. Throughout each section, the scope will narrow to distinct fields like HCI, marketing, psychology, and consumer research. Specifically, relevant studies within these fields will be elaborated on to discuss methods, findings, and contrasting viewpoints or similarities.

A conclusion to this chapter will synthesise and summarise key points, debates, gaps, and questions from the reviewed literature, and elaborate on how this has shaped the thesis direction and research questions.

2.1 Gifting

In this section of the literature review, five areas of gifting are explored. Firstly, discussions focus on gifting as a social act and outline Exchange theory. Secondly, the impact on relationships of gifting is outlined. Thirdly, the gifting ritual is defined and explained, including the different types of exchanges. Fourthly, relevant modalities of gifting are outlined with respective materials involved in each. Lastly, the final part looks at how other rituals are explored within HCI to discuss any implications which could inform exploring the gifting ritual.

2.1.1 A Social Exchange

Mauss (1966) set out to explore exchange practices in archaic societies and asked the question: *"What rule of legality and self-interest, in societies of a backward or archaic type, compels the gift that has been received to be obligatorily reciprocated? What power resides in the object given that causes its recipient to pay it back?"*(p.4). The work elaborates on gifting as a social fact, one which is underpinned by giving objects as a token to create or maintain a social bond, ultimately resulting in societal expectations to give, receive, and reciprocate. Multiple Social Exchange Theory works tend to build upon the Maussian view and agree that **exchange can include the transfer of emotions, relationships, and objects** (Blau 2017; Mauss 1966; Befu 1977). On the other hand, anthropologist Sykes (2004) argues that the habit of gift-giving complicates the notion of relationships being essential to material life and states: *"Once a person understands how to receive and how to give a gift, then the material world can never be simply distinct from his or her ideas about the relationships he or she keeps in that world"* (p.59).

Gifting as a social activity relates to expressions of a relationship (Sherry 1983) and social functions of power, influence, and sympathy (Lévi-Strauss 1944). Gifts become part of social circumstance due to associations with identities, relationships, and symbolism (Philp et al. 2016; Schwartz 1967; Belk, Russell W 1988) thus,

reaffirming relationship status and integration as part of a group (Sherry 1983). Schwartz (1967) explains, *"Gifts are one of the ways in which the pictures that others have of us in their minds are transmitted"* (p.1).

Despite evident social benefits of gifting, sociologist Blau (2017) highlights how everyday interactions contribute to obligations and imbalance within social relations. Carrier (1991) further elaborates on how the model of exchange entails people, objects, and social relations which are all part of everyday transactions. All of which contributes to gifting as a 'social fact', however Sykes (2004) questions how applicable or relevant this argument is when **we now practice gifting through digital means in increasingly virtual societies.**

Within the field of marketing, exchange theory is a central concept that defines the underlying mechanisms of marketing exchanges. Bagozzi (1975) defines the meaning of exchange theory as: *"direct transfers of tangible entities between two parties"* (p.32). Entities extend to products, relationships, emotions, and transactions. An example of this is how the value of gifted objects go beyond their face value and transform to become part of a social setting (Blau 2017). A box of chocolates has a market value, but when gifted the value becomes inherently linked to the gift-giver and forms part of the social ritual. The concept of objects inheriting a sense of the person who gave it is defined as 'inalienability' (Weiner 1992), where **we associate gifted possessions with people and relationships**. In section 2.1.4 the role of possessions and objects in gift exchanges is expanded on.

In brief, social exchange is complex, subjective, and personal. What began as a means of economy and necessity remains within modern societies. **Exchanges are still underpinned by power, sympathy, obligation, and symbolism but now take multiple forms to pervade physical and digital spaces.**

2.1.2 The Impact of Gifting on Relationships

As mentioned in the previous section, **gifting is a socially important tool to connect with others** however gifts can also transform relationship meaning. Sherry (1983) specifically commented on the 'reformulation' stage of a gift exchange. This is the part when the relationship between givers and recipients can be influenced because of the gift. Additionally, the author outlined four outcomes on relationships based on a gift:

1. Strengthen
2. Affirm
3. Attenuate
4. Sever

Evolving since then, Ruth, Otnes, and Brunel (1999) set out to explore the long and short-term impacts on relationships of gifts. Through qualitative methods, authors discuss how giver/receiver relationships are only altered based on the recipient's perspective of the gift. The authors further note impacts on relationships in addition to the work of Sherry (1983). Firstly, the negligible effect is indifference or minimal change to the relationships. Secondly, negative confirmation is due to a lack of connection or bonding via the gift. Thirdly, weakening harm does some damage to the relationship but does not sever it completely.

Aside from impacts on relationships, when selecting gifts givers tend to consider relational signalling as opposed to recipient preferences (M. K. Ward and Broniarczyk 2016). The authors further discuss givers' motivation deviating between altruistic and egotistical. On one hand, givers want to purchase the preferred gift for the benefit of their recipient. On the other hand, they want to use the gift as an opportunity to show the recipient their knowledge of them, in turn signalling their relationship. Similarly, Aknin and Human (2015) discuss how giver-centric gifts (gifts that relate to characteristics of the gift-giver) can promote positive relational benefits with

participants reporting a greater sense of relational closeness. On the other hand, it should be noted that gifts with great sentimentality or expectation to strengthen or reaffirm relationships can promote pressure or fear within gift-givers (Givi and Galak 2017). Gift-giving can often result in anxiety or worries, especially those exchanges which are deemed novel (Wooten 2000). Further, gifts can be opened collocated in-person with others and a gift-giver, or remotely with the recipients opening gifts alone away from their gift-giver. As Wooten (ibid.) mentions, when recipients open their gift collocated with their giver or other people, both giver and recipient experience anxiety and nerves about the gift. A key difference between remote and collocated gifting is the synchronous and asynchronous reaction of the gift. For example, collocated recipients may worry about not knowing how to react, if they are showing enough gratitude, and showing equal interest in each gift if multiple gifts are presented (Sunwolf 2006). Speculatively, perhaps remote exchanges can promote a more curated or polished reaction from the recipient. Overall, the social impact of gifting has contributed to the widely researched phenomenon, resulting in several types and ways of gifting.

2.1.3 The Gifting Ritual

Gifts can be defined as *"something given without receiving payment, often in the expectation of reciprocation and of changing the relationship with the recipient"* (Davies et al. 2010) (p.414). In addition to this, R. W. Belk and Coon (1993) expand on the meaning of a gift as: *" a good or service (including the giver's time, activities, and ideas) voluntarily provided to another person or group through some form of ritual presentation"* (p.394). There are multiple definitions of gifting, with some focusing more on the transfer of physical objects within relationships. Whereas others more abstractly center on social exchanges of time and effort. In the past decades, research into the types of gift exchanges has enabled varying categories that contribute to emerging definitions of 'the gift'.

One option is self-gifting, which is the process of purchasing a gift for oneself (Sherry,

McGrath, and S. J. Levy 1992) and is related to self-rewarding (J. Park 2018), celebrating an achievement (Mick and DeMoss 1990), and a therapeutic act (Kauppinen-Räisänen et al. 2014). An area of debate in gift-giving literature is charitable giving, with some arguing a charitable donation differs from gift-giving because one cannot hold the same emotional or social bonds for entities like charities as possible for individuals (Fischer, Gainer, and Arnold 1996). Moreover, Bajde (2009) argues that charitable gifts are truly voluntary unlike those given in reciprocal gift-giving relationships. Thus, aligning with the view reciprocal gift-giving is a paradox that involves a feeling of 'paying back the gift' or indebtedness (Pyyhtinen 2016).

Similarly, online platforms and communities have resulted in online gifting between those who may have never met before in-person. For example, Giesler (2006) explored consumer gift systems through Napster (a peer-to-peer file sharing system which focused on sharing music files). Findings highlight a more 'nomadic' type of gifting which is entirely voluntary and flexible. A more recent example (Gros et al. 2017) outlines the motivation to gift money to creators on Twitch (a video game live streaming platform), noting how streamers usually acknowledge the support from viewers who spend money or 'gift' them. This type of gifting differs from traditional reciprocal exchanges.

Reciprocal exchanges usually involve one gift-giver and one recipient with relationship types ranging from partners, friends, and families (Nguyen and Munch 2011; R. W. Belk and Coon 1993). Others refer to these types of exchanges as dyadic (Lowrey, Otnes, and Ruth 2004) meaning an exchange within a two-person relationship. A key component of a dyadic gift exchange is the ritual that surrounds the occasion, activities such as searching for the gift or spending time wrapping the gift, all contribute to the surprise element often expected within an exchange (Ruffle 1999; Galak, Givi, and Williams 2016). Yet, there remain inconsistencies between giver and receiver expectations when it comes to gifting.

Gift-givers tend to relate expensive gifts with thoughtfulness (Galak, Givi, and

Williams 2016). Whereas recipients do not always feel value corresponds with price. Another scenario involves 'earmarking' (gift-giver suggesting what a cash gift could be used for). However, Givi and Das (2022) found that gift-givers generally do not make these purchasing suggestions as they view them as less thoughtful. On the other hand, recipients would prefer gift-givers to earmark cash gifts more often. Similarly, studies have centered on failed gift experiences (Branco-Illodo, Heath, and Tynan 2020), with work uncovering ways in which recipients cope with a failed gift exchange, for example, by concealing their true feelings to the giver. Further, research into what makes the "best gift ever" (Branco-Illodo and Heath 2020) aimed to understand the properties of a special gift through interviews with participants. Findings revealed how special gifts are often associated with unforgettable and life-changing experiences. Notably, the authors called for an exploration of **how digital technology may impact perceptions of what a successful digital gift may involve.**

Despite all the facets and nuances surrounding gift exchanges, the ritual remains ubiquitous but varies between cultures and relationships (Davis 1972). Western culture generally views gifting as a commercial activity that involves the transaction of objects (Davis 1972; Philp et al. 2016; Otnes, Lowrey, and Kim 1993) based around occasions like birthdays, Christmas, weddings, and graduations. Whereas, gifting in eastern cultures such as Korean (S.-Y. Park 1998) or Japanese (Green and Alden 1988) tend to gift on more occasions including, New Year's Day, funerals, and promotions. Thus, gifting remains a widely researched phenomenon in many settings and cultures, although the methods and materials that make up a gift can vary.

2.1.4 Gifting Materials and Modalities

There are several forms and modalities of gifting that include: physical gifts, digital gifts, and hybrid gifts. This section will elaborate on each whilst discussing the materials involved.

Physical Gifts: The gifting phenomenon is associated with physical objects, commodities, or products (Sherry 1983; Galak, Givi, and Williams 2016; Ruffle 1999; Davis 1972). These physical gift items tend to be exchanged face-to-face. However, the convenience of online shopping has enabled physical products to be shipped directly to recipients (Gupta, R. Bansal, and A. Bansal 2013). Commercially, this is reflected via online retailers offering gift-wrapping or options to 'mark the item as a gift' to conceal the price to the recipient.

Many of these products are crafted by 'gift producers', who market their products with the intent they can be gifted. A common example is small artisan or craft businesses that produce hand-made gifts, which are a popular choice for gift-givers who want to convey emotion and love via physical objects (Marotta and Heying 2018; Fuchs, Schreier, and Van Osselaer 2015). On the other hand, common consumer goods manufactured by larger organisations can also be gifted (Davis 1972). **Although brands and individuals can market their goods as 'gifts' it ultimately is determined by the person who is sending or receiving it to perceive an item as a gift** (Befu 1977). For this Thesis, the term gift producer is defined as *a business or individual who manufacturers products to sell with the intent that they could be gifted.*

Some producers of products opt to personalise their physical products. Personalisation is generally defined as "a process that changes the functionality, interface, information content, or distinctiveness of a system to increase its relevance to an individual" (Blom 2000). Whilst consumers may purchase personalised products for social motivations or expressions of identity (ibid.), producers may wish to fulfil consumer needs and provide products that they can form an emotional bond with (Mugge, Schoormans, and Schifferstein 2009). Commercial examples demonstrate how gift producers may differentiate their products by adding personal names, photographs, notes, or dates to their physical gift products.

Extant literature explores the exchange of physical gift items and debates how sym-

bolism, identity, and ownership (Philp et al. 2016; Schwartz 1967; Belk, Russell W 1988) are represented via objects. Belk, Russell W (1988) theorised how possessions are part of the 'extended self'. Specifically, **gifts can symbolise others, resulting in gifted items becoming special or rare**. Belk, Russell W (ibid.) further notes how gift-giving is a gratifying act that enables recipients to form part of the giver's extended self.

The 'extended self' is not only applicable to physical items. Weiner (1992) defined inalienable possessions as objects that inherit the sense of a person, for example, a gifted necklace from a grandmother which serves as a reminder of them. Since then, Spence (2019) argues that both physical and digital gifts can inherit a sense of the person who gave the object. This theory is demonstrated in Taylor and Harper (2002) ethnographic study, which examined text exchanges between teenagers. Findings showed that key gifting traits underpin motivations to send, receive, and reciprocate text messages. However, the topic is often debated in HCI whether digital materials can be gifted at all with **some arguing digital content can only be shared as opposed to gifted** (Giesler 2006; R. Belk 2010; Golsteijn et al. 2012).

A further debate in this space is the gifting of money, and if this counts as a 'physical' gift. As mentioned in 2.1.3, gifts of cash can be 'earmarked'. This means that givers make a suggestion of a physical gift item the recipient could buy with the money (Givi and Das 2022). Moreover, money could potentially belong to a special category of gifts, with Gino and Flynn (2011) elaborating that recipients may appreciate but do not feel comfortable asking for money as a gift. Despite discrepancies in reciprocal gift-giving regarding the appropriateness of money as a gift, money is also associated with charitable gifting or donations with some arguing that these transactions still represent gifting (Davies et al. 2010). Additionally, although this review defines the categories of physical, digital, and hybrid gift, it is also recognised that not all gifts may fit into these categories with money being one example that is dependant on the type of exchange and whether the gift-giver has earmarked money for a specific object.

Digital Gifts: As technology has advanced and changed over time so has the gifting ritual. We now send and receive digital gift cards via email, or 'personalise' greetings cards with our digital images. Examples of digital gifts include vouchers, music, audio-books, and subscriptions, which can be defined as *"intangible digital objects that are intentionally exchanged as gifts online and in digital formats, not bound to physical containers"* (Kwon et al. 2017) (p.2372). This convenient modality of gifting has been viewed as a suitable replacement for in-person exchanges (Kizilcec et al. 2018) yet there lacks understanding of framing digital possessions as a gift, with Branco-Illodo and Heath (2020) encouraging exploration of what a successful digital exchange may involve.

The value of digital possessions is an area of interest and debate within HCI (Odom and Pierce 2009; Kalnikaitė and Whittaker 2011; Petrelli, Whittaker, and Brockmeier 2008; Golsteijn et al. 2012; Odom, Zimmerman, and Forlizzi 2014). For example, works (Petrelli, Whittaker, and Brockmeier 2008; Odom, Zimmerman, and Forlizzi 2014; Golsteijn et al. 2012) discuss how we accumulate large volumes of digital media, with attempts made to distinguish what is classed as a cherished digital possession (Petrelli, Whittaker, and Brockmeier 2008; Golsteijn et al. 2012). Themes from these HCI works include how digital material is useful for reminiscence or story-telling (Golsteijn et al. 2012). Petrelli, Whittaker, and Brockmeier (2008) further discusses how attaching digital material to physical objects can tell relevant stories, which perhaps could contribute to a sense of 'place' for curated digital material in the physical world (Odom, Zimmerman, and Forlizzi 2014). Despite many of these studies highlighting viewpoints and design recommendations, few deviate from comparative studies, which has contributed to limited knowledge on the place of hybrid products within social rituals.

Hybrid Gifts: Recently Denegri-Knott, Jenkins, and S. Lindley (2020) discussed the need to shift away from these physical versus digital comparative narratives and focus on the possibilities of merging physical and digital materials. Further, the authors state how the merits of digital objects are now similar to physical,

meaning we can buy, treasure, trade, and sell these objects just like we can physical possessions. One option to explore this concept is hybrid gifting, which is defined as merging physical and digital materials to create a single gift (Koleva et al. 2020; Spence, Bedwell, et al. 2019; Kwon et al. 2017).

Examples of merging physical and digital material to craft new experiences were explored by Golsteijn et al. (2012), the study enabled users to create physical objects that embed media. Since then, the concept of merging physical and digital gifts and their wrappings was considered by Kwon et al. (2017). The work reviewed gifting literature to create the five-stage gift exchange model (see Figure 2.1). The model illustrates the five key points in a gift exchange from both giver and receiver viewpoints.

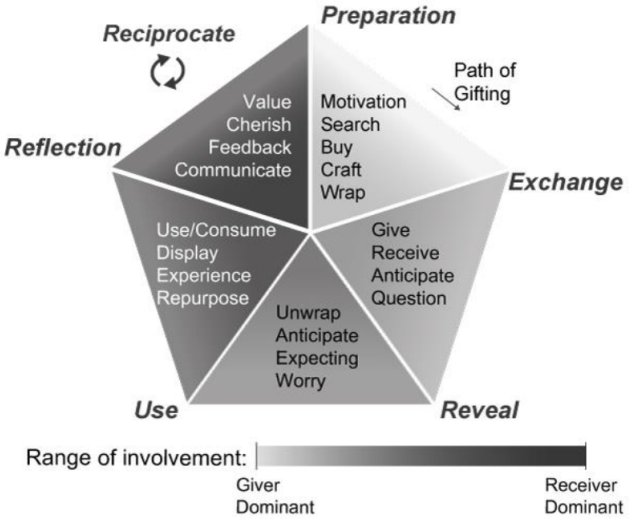


Figure 2.1: Five-Stage Gift Exchange Model (Kwon et al. 2017)

Kwon et al. (ibid.) used the model to interview participants about both physical and digital gifts they had received. Findings showed that digital gifts elicit less excitement throughout the five stages as opposed to physical, with lack of wrapping paper and ownership being contributing factors. Ultimately, the authors suggest the concept of hybrid gifting to address the critiques and value perceptions of digital gifts.

Further work within the hybrid gifting space (Koleva et al. 2020; Spence, Bedwell, et

al. 2019; Benford, Koleva, Preston, et al. 2018) includes a physical Christmas advent calendar which could be digitally customised. Findings from the study highlight how a hybrid model supports emotionally meaningful connections between families and friends (Koleva et al. 2020), and the potential applicability of this model to other types of products. Despite these insights, in-depth knowledge of the types and extent of emotional connections formed through the hybrid gifting model remains limited.

A prominent suggestion from work within the hybrid gifting area point to the use of 'digital layers', which are defined as *"technologies such as augmented reality and locative media appear to overlay digital layers on physical artefacts or settings"* (p.7) (ibid.). Further, **digital layers can be a way to wrap physical objects in digital materials or vice versa**. Overall, digital layers can display media or augment physical environments or product, with authors suggesting further use of these implications to create new gifting experiences.

Despite the consideration of digital technologies in multiple physical environments and spaces, gifting is a ritual that remains largely one-dimensional. **Gift exchanges typically either include physical or digital material**, with limited understanding of the possibilities of merging both physical and digital objects. Research within HCI tends to focus on other ritualistic acts aside from gifting despite advancements that enable gifting through digital means.

2.1.5 Rituals in Human-Computer Interaction

This section explores other rituals within the field of HCI to understand the potential applicability of methods, findings, and implications on the gifting ritual. **Rituals are a set of acts or practices related to cultural patterns of societies** (Giovagnoli 2017). The commonplace of rituals has resulted in several HCI works exploring multiple types of social rituals and technologies. One example focuses on Christmas and highlights specific rituals of preparation, celebration, and storage to encourage the design of technology to support family celebrations (Petrelli and

Light 2014).

An interview study conducted by Sas, Whittaker, and Zimmerman (2016) explored the ritual of 'letting go' of possessions to overcome grief such as divorce. Specifically, the authors uncovered how digital objects are discarded through the act of deletion which they argue does not have the same impact as physically discarding objects. Similarly, HCI studies have focused on bereavement and technologies (Wallace et al. 2020; Jung et al. 2023), one autobiographical study by Wallace et al. (2020) discussed the use of a handheld artefact to maintain an ongoing connection with a deceased person. The authors suggest HCI research could further investigate making rituals more dynamic via digital design. A final example was the design of a smart-vase to uncover if digital technologies can support the creation of floral tributes and memorials. Findings from interviews demonstrated a need for digital equivalents of tributes and rituals to be thoughtfully designed to support users' current physical ritual practices (Uriu et al. 2021).

A key theme throughout the ritual examples is the ambient use of technologies to either connect with possessions or people. Ambient or ubiquitous computing relates to technology embedded within everyday artifacts where they become part of our lives (Krumm 2018), specifically ambient technologies tend to be related to the experience or use as opposed to the technology.

An example by Google (2022) entitled *Little Signals*, considered new subtle technology devices that could shift between background and foreground to alter physical environments to respond to changing surroundings and needs (e.g., notifications). A series of six objects were developed each using a different modality to alter the physical environment: air, button, movement, rhythm, shadow, and tap. The varied examples demonstrate the scale and interest in designing ambient technology which differs from embedded habits, although this way of designing is not yet specifically linked to the rituals space in HCI it could be an interesting approach to adopt.

Related to ambient design, slow computing involves designing systems that are in-

tentionally slow but not in a frustrating sense (Hallnäs and Redström 2001). This involves principles like slow consumption, solitude, mental rest, and reflection (Hallnäs and Redström 2001; Odom, Banks, Durrant, et al. 2012; Odom, Bertran, et al. 2019).

To further elaborate, slow technology differs from fast technology which is typically associated with efficient functionality to make designs as fast and easy to use as possible. Whereas slow technology relates to supporting various activities as part of an environment instead of designing a technology to be 'used' (Hallnäs and Redström 2001).

A slow technology example by Odom, Selby, et al. (2012) involved creating a device to randomly print out online photo collections with the aim to encourage a slower form of consumption with photos in a meaningful way. Moreover, other examples of slow technology studies have focused on temporal elements like the past or aging media collections to encourage reflection. For example, work by Wallace et al. (2020) relates to interacting with media in a slow and ambient way to support on-goingness and bereavement. Another example by Odom, Banks, Kirk, et al. (2012) focuses on technology heirlooms to support the slow inheritance of digital objects between families. In addition to the temporal themes other agendas in slow technology include designing across multiple generations and lifespans and more generally the designs tend to encourage a less consumptive lifestyle and practice (Odom, Banks, Durrant, et al. 2012).

In brief, although works in anthropology (Bassett 2021) and HCI (Sas, Whittaker, and Zimmerman 2016; Uriu et al. 2021; Petrelli and Light 2014; Odom, Banks, and Kirk 2010) explore various rituals, designing for the gifting rituals remains an under-explored area. However, key themes from other ritual works and slow technology design philosophies allude to designing experiences that are thoughtful, dynamic, intentionally simple, ambient, and personal.

2.2 Technologies and Hybridity

This section of the literature review explores three areas. The first section outlines work related to hybrid environments and designing blended experiences in the gifting space. The second section evaluates potential technologies that could be integrated into hybrid gift exchanges. The final part outlines the use of technologies within interpersonal relationships.

2.2.1 Hybridity and Human-Computer Interaction

This thesis focuses on the modality of hybrid gifting: merging physical and digital material to create a single gift. Hybrid environments and experiences are a familiar concept within HCI. Many experiences now involve digital technologies that integrate with physical environments (Benford, Giannachi, et al. 2009), such as museums (Spence, Bedwell, et al. 2019), augmented reality games (Hamari et al. 2018), and theme parks (Anstead et al. 2012; Durrant et al. 2012).

Further, work by Benford, Giannachi, et al. (2009), discussed the trajectories for passing through hybrid structures. These trajectories included time, roles, space, and traversals between physical and virtual worlds. Notably, the authors state how performance and theatrics have a role within these hybrid structures to deliver compelling stories and experiences to users. Since then, O'Keefe et al. (2021) used these trajectories to design 'blended experiences' between digital content, physical objects, and spaces. Through storyboarding the authors highlight how smooth transitions between digital and physical may promote users to feel present in a blended space, and how this provides a new form of engagement.

Hybrid environments can also be related to Mixed Reality (MR), which was once defined as the *"merging of real and virtual worlds"* (p.2) (Milgram and Kishino 1994). However, Speicher, Hall, and Nebeling (2019) note the term MR is a continually evolving term with no single definition and can have varying *"degrees of immersion and virtuality, and implicit vs. explicit interactions"* (p.1). Multiple dimensions can

be included within a MR experience for example a key element is vividness, which relates to the richness of mediated technologies and the way in which information is presented in MR (Steuer, Biocca, and M. R. Levy 1995). Similarly, within interaction design, engagement can mean how users engage with new activities and relates to the flow of interactions. Due to increased blended physical and digital spaces, **users can now engage in new social activities with multiple ways in which people can transition between physical and digital spaces**. One example is how our smartphone devices can mediate as a way to engage with digital content from our physical objects/spaces (Benyon 2014).

A related example for this thesis is the design of a blended gifting experience which was presented by Spence, Bedwell, et al. (2019). The study was based on museum visits, where gift-givers would take photographs and voice recordings of artifacts. Recipients would then visit the museum and be guided through the experience whilst opening and engaging with these digital gifts of photographs and voice recordings curated for them by their giver. As a result of this, some participants mentioned that their gift brought back fond memories and elicited emotional experiences. Thus, the authors highlight implications for designing in the blended gifting space which include: empathy, motivation, and personalisation.

Studies that focus on hybridity typically highlight motivation to provide new and immersive experiences to users. Consequently, this impacts how people feel and the emotions they experience. Yet, there lacks an in-depth understanding of how hybrid gifting may facilitate specific emotional connections between giver and recipient. Thus, questions about technologies, emotions, and gifting remain. Such as, what types of emotions can be facilitated through hybrid exchanges? and, what technologies can be used within the hybrid gifting modality to support blended experiences?

2.2.2 Technologies for Hybrid Experiences

A challenge for studies that design and investigate hybrid experiences is deciding what technology to use and why. For example, a hybrid gifting example by Koleva et al. (2020) discussed the concept of a 'digital layer' (defined as *"technologies such as augmented reality and locative media appear to overlay digital layers on physical artefacts or settings"* (p.7)) yet, it remains unclear what are the possible ways that people could interact with and access digital layers.

Taking a physical product as an example, one option could be to use the packaging or physical space afforded by products to act as a vehicle to deliver the digital layer. For example, the consumer engagement literature explains smart interactive packaging, which predominately uses technology for safety or marketing purposes (Abreu, Cruz Freire, and Losada 2012). On the other hand, packaging can be used to promote interaction with physical products, such as, 'living labels' which is an application to tell digital stories in Augmented Reality (AR) via wine bottle labels (Vrigkas et al. 2021). Despite innovations to engage and inform consumers via digital layers, there remains a notable gap in using such technologies within hybrid exchanges. This results in the question of how can gift-givers and recipients create and consume digital layers? This section debates two categories for accessing digital layers, vision-based and passive.

Passive: For this section, passive technology means technologies that are slightly more hidden as opposed to scanning something visual. One method for accessing digital layers could be to use Radio Frequency Identification (RFID) tags on physical products or packaging. RFID tags are a one-way method of communication to store and transmit data using radio waves (Nath, Reynolds, and Want 2006). RFID tags can be read on mobile devices via Near-Field Communication (NFC) technology. Most modern devices automatically enable NFC with no option to disable it. On older devices, specific applications can be downloaded to read and edit RFID tags. One advantage is the ability to modify or update the content (Lotlikar et al. 2013),

a disadvantage is the lack of familiarity using RFID technology to access media, meaning it could be unsuitable for use in a gifting context.

Another technology to consider is sensors which could be used to detect when packaging is open and thus trigger digital media via an application. Sensors are associated with smart packaging to sense product quality, safety, and shelf-life (Kuswandi et al. 2011). Although sensors are an easy way to connect physical products to the internet, they are predominately used for two-way communication within manufacturing (Lydekaityte and Tambo 2018), thus, it's unclear how sensors would be received in a new environment such as a gift exchange.

Vision-Based: For this thesis, vision-based technology is defined as a person having to use their smartphone camera to scan or interact with something physical. For example, AR is a way to add digital materials to physical spaces or objects that can be interacted with in similar ways to the physical world (Craig 2013). An example by Corrigan-Kavanagh, Frohlich, and Scarles (2022) outlined the design of a physical photo album that could be augmented through a bespoke application to add digital annotations to physical images.

One option is ArtCodes, which is a mobile application that enables hand-drawn decorative patterns to become interactive and connect to digital media (Benford, Koleva, Quinn, et al. 2017). Example projects have used Artcodes to explore attaching digital media to objects, for example, the Carolan guitar embedded a series of Celtic knotwork Artcodes to attach digital stories associated with the life of a guitar (Benford, Hazzard, and Xu 2015). Another project by Koleva et al. (2020) explored using Artcodes to digitally augment a physical Christmas advent calendar. Despite affording clear aesthetic, visual, flexible, and playful designs each example project required involvement from professional designers or artisan businesses. A further consideration is the requirement of a mobile application that must be downloaded to scan and interact with Artcodes.

Another option and a technology that is familiar to many is the Quick Response

(QR) code. A QR code is a square pattern that contains encoded information. They can transmit text, images, and website links. Modern smartphones can easily read QR codes via their in-built camera application, making them a popular choice in marketing for brands to engage with consumers (Dou and Li 2008), restaurants to display their menus, and more recently by the National Health Service in the United Kingdom to track and monitor the spread of the COVID-19 pandemic (Sharara and Radia 2022). Despite there being many uses and benefits of QR codes, they are required to be visible and can't be 'hidden' like RFID tags, which could potentially impact the aesthetic design depending on how a QR code was displayed within a gift exchange.

There are many technologies to consider for use within hybrid exchanges, all with their respective benefits and challenges. Equally as important, is not just considering the mechanism to curate and transfer digital layers, but what they are transporting, how they make people feel, and the impact of layering physical and digital within exchanges.

2.2.3 Technologies and Relationships

Technologies have evolved to enhance, support, or maintain relationships and many studies within HCI have focused on understanding technologies and interpersonal relationships. Having said that, Newport (2019) notes **the downside of condensing complex social conversations and communications into a 'like' on social media or a continual texting thread.**

Many relationship types are of interest within HCI such as grandparent-grandchild (Vetere et al. 2009), parent-child (Shin et al. 2021), and long-distance families or romantic relationships (Neustaedter and Greenberg 2012). One example investigated relationships between grandparents and grandchildren (Vetere et al. 2009), the study involved sharing images and text messages. Findings demonstrated how intergenerational media sharing encouraged playful interactions as opposed to serv-

ing a communicative purpose. In a similar sense, Musick, Freeman, and McNeese (2021) explored co-play digital games between parent and child. Findings from interviews outline the affordances of digital games for conversation and bonding through a shared interest with both parent and child finding value in these interactions.

Relationships are not always possible to maintain in person. Shin et al. (2021) set out to explore the importance of video communication via multiple channels and modalities within parent-child relationships with discussions outlining how video calls can elicit a stronger sense of social presence when families live apart. Moreover, Neustaedter and Greenberg (2012) explored the use of video chat within long-distance relationships, findings demonstrating how video calls are a way to connect for longer periods as opposed to texting. Further, the authors note the routines involved and various ways of connecting via video calls such as watching TV shows at the same time, eating meals together, and more generally sharing day-to-day activities.

From a cultural perspective, some families opt to have group chats to keep up to date with the activities and locations of others. An interview study conducted by Mogharrab and Neustaedter (2020) uncovered unique rituals within family group chats such as the frequency of use and how the dynamic of a group chat can change depending on the distance between family members. Relating to geographical boundaries, cultural themes also refer to digital media usage in relationships. One ethnographic example Wilding et al. (2020) uncovered how emotions can translate through digital media within transnational families. The findings demonstrate how **digital devices are 'routinised' and are part of everyday rituals of staying in touch**. On the other hand, it is noted that not just positive emotions can translate, with guilt and obligation being negative factors to consider. Overall, digital repositories and media are deeply routed in societies and are key to sustaining relational connections, yet knowledge of gifting emotions via media remains limited.

2.3 Nostalgia and Memories

This section of the literature review is split into four sections. Firstly, definitions of nostalgia are evaluated and expanded by outlining the types and triggers of nostalgic emotions. Secondly, the topic of human memories is visited which involves a discussion around recollection, remembering, and sharing memories between people. Thirdly, this section sets out related work within HCI, specifically the angles of nostalgia and technology-mediated reflection are elaborated on. Finally, the last section turns to other fields of marketing and consumer research to understand the wider applications of nostalgic emotions in commercial settings.

2.3.1 Defining Nostalgia

In 1688 Johannes Hofer coined the medical word *nostalgia*, stating how the term relates to a disease of homesickness (Anspach 1934). The word nostalgia originates from two Greek words 'nostos' (homecoming) and 'alga' (pain). Evolving since then, many attempts have been made to understand and define nostalgic emotions for modern societies. Werman (1977) explains nostalgic experiences as a joy tinged with sadness. The Cambridge Dictionary defines nostalgic emotions as: *"A feeling of pleasure and sometimes slight sadness at the same time as you think about things that happened in the past"* (Press 1995). Evolving since then, many efforts have been made to quantify nostalgic emotions and define them as a 'personality trait' (Pascal, Sprott, and Muehling 2002; Merchant, LaTour, et al. 2013; Batcho 1995).

Typically, nostalgic emotions are about the past or prior lived experiences. Thus, nostalgia can be associated with reminiscence, which is defined as the: *"act or process of recollecting memories of one's self in the past. It may involve the recall of particular or generic episodes that may or may not have been previously forgotten"* (Bluck and Levine 1998) (p.188). A key difference between the two is that reminiscing can evoke nostalgic feelings, however, **one can reminiscence and recall memories without feeling nostalgic**. Therefore, nostalgia is associated with a

set of emotions whereas the same is not always true when reminiscing.

Nostalgia is noted for positive attributes such as promoting self-esteem, providing opportunities to form social connections, and an increased sense of meaning in life (Wildschut, Sedikides, et al. 2006; Routledge et al. 2012). On the other hand, negative emotions such as sadness, regret, loss, and loneliness can be associated with feeling nostalgic (Holak and Havlena 1992; Wildschut, Sedikides, et al. 2006). This mixture of emotions has resulted in definitions that describe nostalgia as bittersweet (Batcho , Krystine Irene 2013).

Nostalgic emotions can be evoked through a variety of means. Wildschut, Sedikides, et al. (2006) asked participants to describe a nostalgic experience and uncovered key triggers including a negative mood or state that can evoke nostalgic emotions, for example, feeling lonely or depressed. Further, tangible objects, music, smells, similar events, and anniversaries can all trigger nostalgic emotions. Moreover, Holak and Havlena (1992) uncovered themes of nostalgia from 164 descriptions, with people, places, and objects being commonplace in nostalgic reflections.

There are multiple classifications of nostalgia. For example, vicarious experiences relate to history rather than personal memories, this promotes yearning for a past time in which one was not present for (Spaid 2013; Stern 1992). Collective nostalgia refers to emotions shared between individuals who are part of a group, often referred to as 'cultural' nostalgia which is socially shared (Baker and Kennedy 1994; Wildschut, Bruder, et al. 2014). Further classifications range from restorative and reflective as outlined by Boym (2007). Restorative nostalgia is associated with reconstructing the past, whereas reflective nostalgia is a longing for the past. Boym (ibid.) further recognises that these areas are not absolutes, with there being grey areas between restorative and reflective nostalgia. A final classification of nostalgia is personal, which is defined as autobiographical experiences from memory (Spaid 2013; Stern 1992; Tulving 1993), **where it's possible to feel a sense of longing to return to a prior lived experience or event.**

In summary, nostalgia is made up of many emotions and is related to a bittersweet feeling. Nostalgia is different from recalling or remembering the past, rather it's associated with a sense of yearning or longing to go back to a previous time. The personal and subjective nature of nostalgia combined with multiple classifications makes the topic both intriguing and complex. The forthcoming section aims to understand the connections between remembering, memories, and nostalgia.

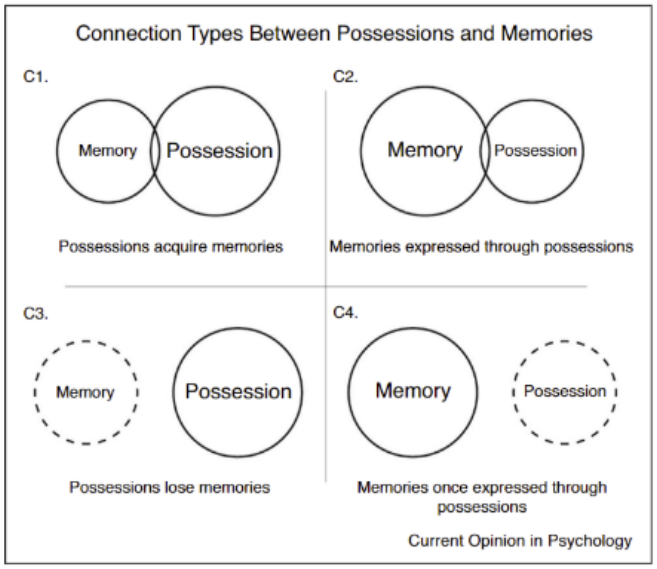
2.3.2 Human Memory

In a cognitive sense, memory is a way of storing and retrieving information that has been acquired through one's senses (Baddeley 1997). Types of memory include semantic and episodic, with the latter being associated with lived experiences, and the former relating to knowledge about the world (Tulving 1993). For example, an episodic memory could be your child's birthday party, and a semantic memory would be the date of your child's birthday. Autobiographical memories relate to both factual knowledge and personal history, thus they are associated with both episodic and semantic recollections (Conway 1996). The accuracy of autobiographical memories can vary, with some memories involving errors or distortions (ibid.). Despite inaccuracies, meaningful autobiographical memories can serve social functions such as teaching to give advice, promoting intimacy or closeness in relationships, and empathy to reassure others (Alea and Bluck 2003).

How one accesses these autobiographical memories can be through a conscious act of remembering which is defined as *"a state in which the subject can consciously recollect specific details about the earlier event, recalling for instance thoughts or feelings it evoked"* (Baddeley 1997) (p.366). Contrarily, autobiographical memories can also be involuntary and appear in one's mind spontaneously without any attempt to deliberately retrieve them (Bernsten 1996).

One way in which memories are recollected is through objects. In psychology, connections between possessions (physical, digital, or hybrid) and memories are dis-

cussed by Van den Hoven, Orth, and Zijlema (2021). The authors note that people can attach memories to objects and outline four connection types (See Figure 2.2). For example, one type entitled "memories expressed through possessions" relates to objects as memory cues. Personal photographs would be a common example of this connection type, however, the authors highlight how digital versions of possessions may impact the association between memory and object, with it being more difficult to form attachments due to lacking physical material.



Visual of the four different kinds of relations between possessions and memories, C1 and C2 represent a connection between possession and memory that still exists, from an object or memory perspective respectively. C3 and C4 have lost the connection (temporarily or permanently) between possession and memory, and either the object or the memory remains.

Figure 2.2: Connections between possessions and memories(Van den Hoven, Orth, and Zijlema 2021)

As well as the connection between possessions and memories, what makes recollecting powerful at times is the multi-sensory way in which memories can be triggered and evoked. Humans have five senses: visual, auditory, taste, tactile, and olfactory, all of which can be used to bring memories back to life. In some cases, it is the presentation of multiple senses at the same time which makes for rich reminiscence. One ethnographic example demonstrated by Mullins et al. (2022), explored the concept of participants loading a suitcase with past holiday mementos, clothes, and photos.

Alongside this, the researchers then created digital films with soundscapes to accompany related food and drink based on participant's holiday memories. Thus, creating a multi-sensory environment to remember the past, with findings uncovering how this contributed towards shared recollections, meaningful communication, and a rich medium to bring the past into the present. A further example by Kirk and Sellen (2008) explored how physical, digital, and hybrid objects can be displayed to keep connections alive with the past. Such as, displaying a photograph of a distant or deceased family member. Thus, even when objects can be associated with negative or sad memories they can serve varying functions.

Moreover, a key element of memories is who they are experienced with, therefore a lot of memories become interpersonal, resulting in social sharing of a past time and emotion (Rimé et al. 2020). On the other hand, sharing memories with people who were not present at the time promotes storytelling and can reinforce self-identity (Wilson and Ross 2003), yet knowledge of technologies facilitating the sharing or giving of digital memories remains limited. Whilst it's possible to communicate by sharing memories (Hirst and Echterhoff 2012), in a literal sense, memories cannot be transferred to others. However, **the commonplace of documenting lived experiences (e.g. photographs, videos, music) may help to transfer media between people to tell a story** of a memory, the following section turns to HCI works to understand the impacts and uses of nostalgic media.

2.3.3 Nostalgia and Human-Computer Interaction

Over the past decades, there has been a growing interest in nostalgic emotions within the field of HCI. One reason for this is **the means to reminiscence over personal digital archives and the ability to feel nostalgic through media** (Moschovi and Galani 2013). A common example is the widespread use of photograph applications, where scrolling through images is a substitute for turning physical pages in photo albums. In some cases, photographs are captured specifically with the aim to one day reflect and feel nostalgic (Cheung et al. 2020). Prior works (Kirk,

Sellen, et al. 2006; Chopra-Gant 2016; Denegri-Knott, Jenkins, and S. Lindley 2020; Moschovi and Galani 2013) illustrate use cases for our digital photographs such as re-purposing our personal photography for public consumption in museum contexts, or sharing our images on social networks, yet from an HCI perspective very little is known about framing these memories as a gift for those closest to us.

As mentioned in section 2.3.1 nostalgia can be associated with a range of negative emotions and experiences: loneliness, sadness, regret, and loss (Wildschut, Sedikides, et al. 2006; Holak and Havlena 1992). Notably, within HCI there is the argument for designing uncomfortable interactions as a way to promote other benefits (Benford, Greenhalgh, et al. 2012). One type of uncomfortable interaction involves cultural associations from three angles: entertainment, enlightenment, and sociality. Perhaps relevant for nostalgic emotions, sociality involves sharing experiences for social bonding and maybe nostalgia could be a means to encourage positive social interactions.

Studies focusing on nostalgia in CHI and DIS communities have varied contexts and taken differing approaches to exploring technology-mediated reflection or nostalgia. Examples have ranged from how nostalgia proneness can impact the likelihood of keeping virtual possessions after a relationship breakup (Brody, LeFebvre, and K. Blackburn 2020) or, the development of physical artefacts to facilitate reminiscence and nostalgia in care home settings (Nilsson, Johansson, and Håkansson 2003). A further example by Sungkajun and Seo (2019) explored an interactive art installation that evoked nostalgia. The exhibit displayed stories of people and their backgrounds on a pond-like surface, one participant from the study noted how the experience would make a "great gift" for someone. Despite differing approaches and environments, a common theme within these works is the use of media to enable reflection.

Multiple works (Sellen, Fogg, et al. 2007; Gurrin, Smeaton, Doherty, et al. 2014; Harvey, Langheinrich, and G. Ward 2016) within HCI focus on the concept of

"life-logging" which is an example of capturing an individual's experiences through technology. In some cases, the volume of captured content makes it difficult to categorise, reflect upon, and organise memories. Despite the evident challenges of maintaining and interacting with our increasing digital archives, researchers within HCI (Odom, Banks, Kirk, et al. 2012; Odom, Wakkary, et al. 2019; Nilsson, Johansson, and Håkansson 2003; Sungkajun and Seo 2019; Cosley et al. 2009; André et al. 2011; Konrad, Isaacs, and Whittaker 2016; Chen et al. 2023) have been designing technologies that promote reminiscence, nostalgia, or reflection through both autobiographical and cultural data.

Popular media types to support emotional recall have ranged from personal and public images, videos, music, voice notes, news excerpts, and past social media posts (Moschovi and Galani 2013; Odom, Wakkary, et al. 2019; Nilsson, Johansson, and Håkansson 2003; Sungkajun and Seo 2019; Baumgartner 1992). Further, the role of media being a tool to construct memories is an area of interest within HCI (Hoven 2014; Bowen and Petrelli 2011; Hoven and Eggen 2008). These works discuss how technology could be used to store media as memory cues for past events but argue that augmented memory systems cannot store memories (Hoven and Eggen 2008). **Whilst there would be difficulty in capturing wholly accurate accounts of lived experiences, works point to technology-mediated reflection as a way to build repositories for selective reminiscence** (Sas, Whittaker, and Zimmerman 2016). The value of selectively capturing and documenting lives through media includes re-living of memories, social recollection, and reinforcement of self-identity (Sellen and Whittaker 2010). All of which has contributed to emotional attachment to digital possessions (Rimé et al. 2020).

One example by Odom, Banks, Kirk, et al. (2012), focused on creating three devices to capture 'technology heirlooms' to uncover how such devices may support the inheritance of valuable digital images across generations. Findings revealed differences in perceived value between digital and physical objects, highlighting how participants desired to display and interact with digital materials, aligning with

findings of Nunes, Greenberg, and Neustaedter (2008). In more recent work, Odom, Wakkary, et al. (2019) presented a study involving a music player to engage and remind participants of previous music listening history. Through findings, the study demonstrated re-experiencing data can promote rich reminiscence and called for future research to investigate new technologies facilitating everyday experiences.

Further, a recent CHI example (Lustig, Konrad, and Brubaker 2022) explored facilitating and designing for bittersweet emotions when users interact with recommender systems; such emerging studies demonstrate the commonplace of bittersweet media in our everyday lives. However, further exploration of exchanging our increasingly bittersweet media and memories is required. All of the discussed examples display elements of fostering social connections through technology but also **highlight an awareness of the negative outcomes when designing with or for nostalgia**. Yet, an in-depth study of the implications when gifting personal bittersweet memories within HCI remains notably absent. Perhaps turning to other fields to further understand uses and consequences could help inform the potential applications of nostalgic emotions and media in hybrid gifting or related areas.

2.3.4 Nostalgia and Consumer Research

This section visits the fields of marketing and consumer research, where nostalgia has long been an area of interest. Works within this space have viewed nostalgia as a tool for brands to form mass connections with their consumers (Merchant and Rose 2012; Merchant, LaTour, et al. 2013). For example, Merchant, LaTour, et al. (2013) discuss the dimensions of engaging consumers via nostalgic advertisements. Findings from four studies uncovered four dimensions for effective nostalgia-based advertising: past imagery, positive emotions, physiological reactions, and negative emotions (ibid.). Despite the clear applications of using nostalgia to form business-to-consumer connections, an understanding of brands leveraging products to facilitate consumer-to-consumer connections via nostalgia remains absent.

Further, studies elaborate on the relationship between consumer nostalgia and purchasing intentions (Sierra and McQuitty 2007; Pascal, Sprott, and Muehling 2002). For example, if a product or advertisement reaffirms a consumer's identity or heritage it makes the purchasing of that product or service more likely. Moreover, Spaid (2013) discuss how particular products in retail environments can promote purchasing. For example, products that are resurrected, retro, throwback, classic, or associated with a homeland can impact purchasing intent. However, often these studies focus on collective or vicarious nostalgia, meaning knowledge of tailored autobiographical experiences remains limited.

Few works within the field discuss gift exchanges and nostalgia, however, extant research suggests subtle links between self-gifting, luxury brands, and nostalgia (Kauppinen-Raisanen et al. 2014), but not within interpersonal dyadic exchanges. One reason for this is that nostalgia can be a highly personal experience, with Batcho (1995) arguing that some can be more open or susceptible to feeling nostalgic and further state nostalgia is akin to a 'personality trait'. Thus, within dyadic exchanges, one may be unsure of what makes another feel nostalgic

To summarise, nostalgia is regarded as a tool to connect brands with consumers, either through products or advertisements. Evoking nostalgia within commercial settings can have a positive impact on purchasing intentions. However, there remains minimal work on connecting nostalgia and interpersonal gift exchanges, potentially due to the subjective nature of nostalgic experiences.

2.4 Conclusion

This literature review has focused on three main themes of gifting, technologies, and nostalgia. Firstly, the theme of gifting explored the underlying social functions of exchange, focusing on key works by Mauss (1966) and Blau (2017). Following this, definitions of gifts are debated, including the differing types of exchange. For example, self-gifting and reciprocal gifts were considered with discussion around settings,

cultures, and occasions. Further, modalities of gifting and respective materials that can comprise gifts were outlined. This included hybrid gifting, physical gifts, and digital gifts with specific mention of key literature by Koleva et al. (2020) and Kwon et al. (2017). The final part of the gifting theme goes beyond the gifting ritual and explores how other rituals like bereavement and Christmas have been explored within the field of HCI. This section aimed to understand themes and tensions from previous work and the potential applicability of researching the gifting ritual.

In summary, key questions and research gaps have been highlighted within the gifting theme. Gifting is a widely researched phenomenon and relates to the exchange of objects, emotions, and relationships. **Despite digital gifting being a popular modality to send and receive gifts, they remain largely one-dimensional with limited understanding of the possibilities when merging both physical and digital objects** to create hybrid gifts.

The second theme of technologies and hybridity considered hybridity within HCI and specifically looked at key works (O'Keefe et al. 2021; Benford, Giannachi, et al. 2009) on blended experiences using physical objects or spaces combined with digital materials. The second part of this theme evaluated technologies that could be used to access digital layers such as QR codes, RFID tags, sensors, and Augmented Reality. This theme uncovered how there lacks an in-depth understanding of how hybrid gifting may facilitate specific emotional connections between giver and recipient and what technologies may support this.

The third and final theme of nostalgia and memories began by defining what is meant by the term and used key works of Batcho (1995) and Wildschut, Sedikides, et al. (2006) to elaborate on the specific types of nostalgia. For example, vicarious, restorative, collective, autobiographical, and reflective. Following this, the topic of human memory is evaluated, this includes capabilities to recall both episodic and semantic memories, with the recognition that large digital archives of memories can be carefully curated and re-experienced. Further, nostalgia was explored via the lens

of HCI with notable work by Odom, Banks, Kirk, et al. (2012) used to understand how technologies have previously been used to support reminiscence or nostalgia. The last area explored fields of consumer research and marketing to understand the diverse applications of nostalgia within commercial settings which outline triggers via products and brands that can promote nostalgic experiences.

Specifically, this theme highlighted how nostalgia is made up of many emotions and is related to a bittersweet feeling, meaning it is a personal and subjective experience akin to a personality trait. Further, this section emphasised that despite the commonplace of vast digital archives that can trigger nostalgia, the implications when gifting personal bittersweet media-memories have yet to be uncovered.

In summary, this literature review has highlighted three key areas for contemplation:

1. The lack of understanding in transforming bittersweet memories as a gift and what the impact might be on gift-giver and recipient.
2. How and if a hybrid gifting modality can support transferring nostalgic emotions between people.
3. A need to understand how nostalgia may connect consumers in dyadic relationships as opposed to using nostalgia for mass connections between brand and consumer.

The three areas identified from this review feed into the following overall aim and research questions of this thesis:

The overall aim of this thesis is to **uncover if and how nostalgia can be evoked within a hybrid gifting modality and the implications of this from gift-giver, recipient, and producer viewpoints**. To attain this goal, the following three research questions are explored throughout this thesis:

1. What are the considerations for embedding or evoking nostalgia in a hybrid gift exchange?
2. What are the variations of nostalgic digital layers and does altering compo-

nents like the type of media impact the experiences of gift-giver and recipient?

3. What are the roles and perspectives of the gift-giver, recipient, and producer within hybrid gift exchanges?

Finally, this review highlights a need to shift away from physical versus digital narratives, instead, the focus should be on the possibilities and potential merits of merging both physical and digital material to craft new experiences. Thus, the question remains, can technology support the transfer of nostalgic emotions within hybrid gift exchanges?

Chapter 3

Methodology

This chapter aims to set out the chosen approaches for exploring various elements of gifting nostalgic memories via hybrid modality. In the case of this thesis, participants were asked to consider nostalgia, gifting rituals, and technologies. Thus, methods were required that enabled an in-depth understanding of personal experiences.

This chapter firstly outlines general HCI and qualitative approaches and techniques that helped to facilitate studies and outlines the ethical and responsible research considerations. The second section entitled 'data capture methods' outlines the use of interviews and focus groups. The third highlights the thematic analysis approach and relevant literature which guided the data analysis processes. The fourth section specifically looks at each study contained within this thesis and outlines the configuration of methods and further presents a structure diagram for the four studies that are contained within this research. The final section is a conclusion which summarises the main methodological approaches.

3.1 Introduction

This thesis comprises of research from four main qualitative studies (The Memory Machine, Nostalgic Gifting Study, the Tailored Gifting Study, and the Producer study). The four studies build upon each other to address the research questions and gaps set out in chapter 1 section 1.1 and to contribute to the overall aim of this thesis: **uncover if and how nostalgia can be evoked within a hybrid gifting modality and the implications of this from gift-giver, recipient, and producer viewpoints**.

This research took a qualitative approach which generally aims to understand the meaning, preferences, and experiences of humans' lives (Marsh 2018; Fossey et al. 2002). This relates to the philosophical standpoint of this thesis. From an ontological point of view, this thesis explores social rituals of gifting between people, therefore the stance for this work is that reality and knowledge can be constructed through social and contextual understanding. Additionally, to understand the origin of knowledge, an interpretivist epistemological outlook is necessary with the belief that knowledge is acquired through people's subjective experiences. In brief, for this thesis, knowledge is demonstrated through interpretations and explanations.

There are multiple qualitative methods including interviews, ethnography, observations, and focus groups which enable the capture of nuanced and subjective data that is open for interpretation. On the other hand, quantitative approaches are often viewed to have more well-defined and prescriptive methods (Lazar, Feng, and Hochheiser 2017).

Given the focus of the thesis relates to subjective gift exchanges between people, a qualitative approach to understanding a complex social ritual was deemed an appropriate course of action. Specifically, the unique combination of exploring the gifting ritual alongside technologies to facilitate exchanges meant that various HCI approaches combined with qualitative methods enabled a deep understanding of participant experiences.

The HCI approaches for this design research PhD ranged from creating technology probes 'or design artifacts' (discussed in detail in section 3.1), the use of an in-the-world approach, and ideation. The"in the world" approach involves carrying out research in real-world settings as opposed to controlled environments (Ssozi-Mugarura et al. 2016; Rogers and Marshall 2017; A. Crabtree et al. 2013). As the aims of this thesis relate to capturing everyday experiences of sending, creating, and receiving a gift, a real world setting outside of a research lab was deemed the most suitable and relevant. In most cases, homes enabled participants to interact with probes, create gifts, and open their gifts all within a familiar environment.

A further participatory method of inquiry within HCI is ideation, which can be used to generate new ideas via interactive activities. One example of ideation is brainstorming to creatively solve problems as a group (Faste et al. 2013). Another common example of ideation is sketching, drawing, or paper prototyping to communicate thoughts or ideas to promote collaboration (Sturdee and J. Lindley 2019).

Overall, the studies used various research methods and approaches to address the aims, goals, and questions of this thesis. The following subsection will discuss in more detail the format of this research design PhD, technology probes, and the adapted probe version entitled a 'gift probe'.

3.1.1 A Design Research approach

Many HCI works now create design artifacts to give form to an idea or concept (Fallman 2003). These artifacts can range in fidelity from operational products, systems, or spaces to paper prototypes, sketches, and drawings (Pierce 2014). The goal of design research can be to construct knowledge by intervening in contexts beyond academia, thus design research is associated with 'situatedness', where the design is specific to people, places, and practices (Pierce 2014; Fallman 2003; Gaver 2012).

This thesis encompasses a design research approach in two ways. Firstly, this work is focused on the specific context and ritual of gifting. Therefore, the work aims to carry out design research to explore a new hybrid version of gifts that intend to evoke nostalgic emotions. Secondly, this work aims to construct new knowledge via "domestic and personal operational artifacts of design research" (Fallman 2003). This is also linked to works on technology probes.

Technology probes are defined by Hutchinson et al. (2003) as: *"a particular type of probe that combine the social science goal of collecting information about the use and the users of the technology in a real-world setting [...] and the design goal of inspiring users and designers to think of new kinds of technology to support their needs and desires" (p18).* Probes differ from prototypes which tend to focus on usability, whereas probes are typically a simple design with a main function. The aim of a probe is to explore a concept with stakeholders or anticipated users in a specific context (ibid.).

For this work, the specific context is gift exchanges, and the specific concept is nostalgic hybrid gifts. To explore this, the design research approach adapted the term technology probe to gift probe which is defined as: a probe that is deployed in dyadic gift exchanges made up of an existing off-the-shelf physical product and a nostalgic digital layer. A gift probe is less about exploring a brand new concept or technology, instead it is a distinct mixture of rituals, existing products, and a simple technology layer that should promote reflection in familiar situations like a gift exchange. The gift probes in this work are discussed and identified in more detail when necessary throughout section 3.4.

The following subsection will discuss ethical considerations of qualitative research and the rest of the chapter is split into three parts of data capture methods, thematic analysis, and methodology configurations. The chapter concludes with a summary of the main approaches.

3.1.2 Ethical considerations

Before discussing details of methods, analysis, and configurations it's important to note the associated ethical implications of carrying out this type of qualitative research within the nostalgic hybrid gifting space. To clarify, all four studies contained in this thesis gained full ethical approval from the university's Computer Science Ethics Committee.

The main consideration relates to nostalgia. Although predominately nostalgia is a positive emotional state (Wildschut, Sedikides, et al. 2006), there are concerns about mental well-being when looking back at the past, which can be bittersweet and in turn promote feelings of loss, loneliness, and sadness (Batcho 1995; Holak and Havlena 1992; Sierra and McQuitty 2007; Wildschut, Sedikides, et al. 2006). Participant well-being throughout all studies was considered and safety measures were put in place, such as if a participant was to become visibly upset they would be asked if they would like to continue with the study. Another measure was to signpost on the information sheets for anyone who might have been affected, including relevant charities e.g. Alzheimers Society and The Samaritans.

A further area was ensuring that confidentiality and anonymity were at the forefront of collecting data. The studies involved personal recollections of memories, images from participants, and information about their close personal relationships. Therefore, the informed consent for all studies clearly stated identifiable information would be anonymised and participants were asked to only share information they were comfortable with.

3.1.3 Responsible Research and Innovation

Responsible Research and Innovation (RRI) considers the questions, challenges, and potential impacts of research (UKRI 2023). RRI has been a key consideration for this thesis from the beginning. For example, the AREA framework (Anticipate, Reflect, Engage, and Act) (ibid.) was used to highlight any assumptions and possible social

impacts of studies. Further, the 'ORBIT self-assessment tool' (Stahl 2017) was used to understand the alignment of research studies to RRI practices and highlights areas such as governance, gender, open science, and engagement. Overall, the aim was to make this research inclusive, transparent, reflective, and ethically sound. This was to ensure high quality research output which considers the broader aspects of societal impacts, sustainability, and moral accountability.

3.2 Data Capture Methods

This section outlines key data capture methods used throughout the studies in this thesis: interviews and focus groups. Following that, the thematic approach to analysing data is outlined.

3.2.1 Interviews

A popular method within social science and HCI to capture individuals' attitudes, preferences, and experiences is user interviews (Marsh 2018). Differing from other methods like surveys, interviews can elicit longer and more in-depth answers from participants (Lazar, Feng, and Hochheiser 2017). On the other hand, Lazar, Feng, and Hochheiser (ibid.) also acknowledges the challenge of interviewing with the potential for unrelated topics to derail the focus of the interview.

There are multiple different types and ways of carrying out interviews, two main categories are semi-structured and structured. The former is associated with flexibility, often with themes or topics planned but the direction can be steered and adapted to follow any interesting discussions (Blandford 2013). The latter is associated with a list of predefined questions with little flexibility. Interviews can be conducted individually with one participant or with a pair of participants. Paired interviewing is only suitable in certain circumstances such as if the topic is about collaboration, or if a sensitive topic is being discussed, friendship pairs could emotionally support each other (Marsh 2018).

Interviews can be carried out either online or in-person, each with their respective advantages and disadvantages as discussed by Marsh (2018). For example, in-person interviews conducted within an office may be intimidating for participants. Whereas, online interviews may be quicker to plan and run, with the added advantage of accessing a wider range of participants who are geographically located outside the area of the university or researcher. On the other hand, researchers should be aware that online interviews may exclude those with limited technology access or literacy.

There are several techniques and considerations for conducting interviews. One common requirement for semi-structured interviews is to create a guide or script (Lazar, Feng, and Hochheiser 2017; Blandford 2013). This script helps to guide the interviewer through the interview but still affords flexibility within topics. There are multiple best practices when interviewing as set out by Lazar, Feng, and Hochheiser (2017) and Marsh (2018). This includes the importance of researchers using neutral language, recognising that silence is not agreement, using pauses to give participants time to think, and to word questions purposefully broad to promote a more nuanced understanding of topics.

Finally, an area of debate within qualitative research relates to how many participants are enough. Blandford (2013) argues that there is not a set minimum or maximum amount of participants for qualitative studies. On the other hand, Nielsen (2000) proposes that 5 participants is the optimum number for usability studies, stating that the more users added the less you learn with the same things coming up with each new participant. Thus, the number of participants to interview may vary depending on what is being researched and how long interviews last. An indicator of when recruitment can end may be when discussions become repetitive with some sense of saturation.

3.2.2 Focus Groups

Focus groups are a way to explore interactions between participants with the researcher being a facilitator (Blandford 2013). A main difference between interviews and focus groups is the group dynamic when completing interactive tasks (Lazar, Feng, and Hochheiser 2017). Focus groups can use materials to stimulate discussions, such as newspaper articles, images, films, packaging, and card games (Wibeck, Dahlgren, and Öberg 2007). Due to interactive elements, a smaller number of questions is required for a focus group as opposed to an interview. Lazar, Feng, and Hochheiser (2017) comment on how focus groups can be structured or unstructured, and allude to how some techniques can be useful within both, to build consensus on a topic.

Focus groups can facilitate discussion around a topic (Gibbs 1997; Kamberelis and Dimitriadis 2013), gather alternative viewpoints, and uncover consensus of a group (Adams and Cox 2008; Smithson 2000). One method to gauge consensus with focus groups is The Nominal Group Technique (NGT), which can elicit the priorities of a group by asking each participant to individually write down opinions or answers to a question. Ideas are then shared from the group with participants clarifying and elaborating on ideas where needed. Similar ideas are grouped, and finally, each idea is ranked and condensed to a 'top 5' (McMillan et al. 2014; Hugé and Mukherjee 2018). Although not a common method in HCI, a few examples demonstrate how to engage users with the technique and how it can be adapted (see Figure 3.1).

As with any method, there are concerns regarding the validity, due to participants 'performing' rather than it being a natural setting (Rosenbaum et al. 2002; Morgan 1996). To mitigate against this shortcoming, focus groups can involve activities to promote conversation and incorporate participatory tasks (Spinuzzi 2005).

Table 1. STEPS IN THE NGT

1. Introduction
2. Silent Generation
3. Round Robin
4. Clarification
5. Ranking and Weighting
6. Discussion and Closure

Figure 3.1: Steps in NGT for a study with HR professionals (Lederer 1986)

Focus groups require the researcher to be non-judgemental, a good listener, and able to create a comfortable environment in which participants feel able to share their opinions (Krueger 2014). Further, the facilitator will need to manage a group setting, time, stay on topic, and work through activities (Lazar, Feng, and Hochheiser 2017). In addition to this, focus groups are in danger of being dominated by one participant (Krueger 2014). Some techniques and questions like the following could help to mitigate this: "Participant X, is there anything you'd care to say about...?" or, "Does anyone have a different opinion?" (Lazar, Feng, and Hochheiser 2017). Thus, it is important within focus groups to have a clear agenda and structure.

Discussions within focus groups can last between 60-90 minutes (Wibeck, Dahlgren, and Öberg 2007) and usually involve 6-9 participants (Casey and Krueger 1994), although participatory studies suggest anywhere from 2-8 participants is suitable (Kuhn and Muller 1993). Generally, relying on a single focus group is viewed as unrepresentative, with two or more groups being optimal (Casey and Krueger 1994). Having said that, this depends on how difficult it is to gain access to a particular demographic or audience.

3.3 Thematic Analysis

A mixture of focus groups and interviews were conducted throughout various studies in this thesis. One method for analysing qualitative data is thematic analysis.

Thematic analysis is a way of telling a story from qualitative data and relates to finding repeated patterns of meaning (Braun, Clarke, and Hayfield 2022).

There are multiple approaches to conducting thematic analysis. For example, a coding reliability approach involves developing themes from a pre-determined codebook (Boyatzis 1998), which is similar to deductive approaches of using a template to fit data within pre-established themes (B. F. Crabtree and Miller 1992). This further involves multiple coders as a way of testing for consistency to ensure the reliability of codes (Braun, Virginia and Clarke, Victoria 2019). There are 'in-between' variations of thematic analysis that can use a codebook to take a more structured approach to early theme generation. On the other hand, an inductive approach involves using data to generate and drive the direction of the themes.

Another type of thematic analysis is reflexive. This is defined as a flexible approach to thematic analysis which is subjective, recursive, and focuses on the assumptions and disposition of the researcher (ibid.). Part of the reflexive process includes coding data with an emphasis on underlying research values and assumptions which negates the use of a structured codebook (ibid.).

Overall, for this thesis, the studies explored in-depth human experiences within personal gift exchanges. The emphasis on such a subjective and sometimes sensitive topic of memories lends itself to a flexible and reflexive approach to better represent and understand participant experiences.

The approach for thematic analysis followed the Braun and Clarke (2006) phases for thematic analysis and the researcher was positioned in the inductive and reflexive category, which also involved revisiting relevant literature to inform, position, contextualise, and name themes. The stages are as follows:

1. Data familiarisation- researcher cleans and anonymises transcripts highlighting any notable quotes or ideas.

2. Generating initial codes- each quote is coded to encapsulate ideas, underpin-

nings, and meaning.

3. Generating themes- collate codes and group them into broadly related topics.
4. Reviewing themes- check codes relate to initial themes and alter groups where necessary.
5. Defining and naming themes- generate a story with themes, make sure names are clear for each theme, and involve other researchers at this point.
6. Producing the report- think about how the findings relate to literature and research questions to accurately document the findings.

3.4 Methodology Configurations

This section outlines each method adapted for the four main studies of this thesis (the Memory Machine, the Nostalgic Gifting Study, the Tailored Gifting Study, and the Producer Study). Each subsection will briefly state the aim and focus of the work, the chosen approach with rationale, how the method was used, and the analysis. Whilst some details are presented for each study, this is not exhaustive and more details will be presented throughout each chapter, such as participants, recruitment methods, questions to explore, and study design.

Figure 3.2 provides an overview of the studies, the approach, and how they informed each other. Firstly, the study of MeMa aimed to address prominent gaps in understanding if memories can be transformed into digital gifts from a gift-giver perspective. Findings from this study uncovered an understanding of nostalgic emotions, media, giver motivation, and giver experience but not how this would translate to a hybrid modality. Thus, the Nostalgic Gifting Study set out to uncover how this may look and feel, resulting in roles of giver, recipient, nostalgia, media, and objects. The Tailored Gifting study then took the established roles from previous work to explore altering objects and media via providing more freedom within these exchanges to understand the impact on nostalgic experiences but also the types of physical gifts

that can be integrated with nostalgic digital layers. Lastly, the Producer Study built on the understanding from the Tailored Gifting study and previous work to present the hybrid modality to gift producers with the aim of capturing their perspective on nostalgic hybrid gifts.

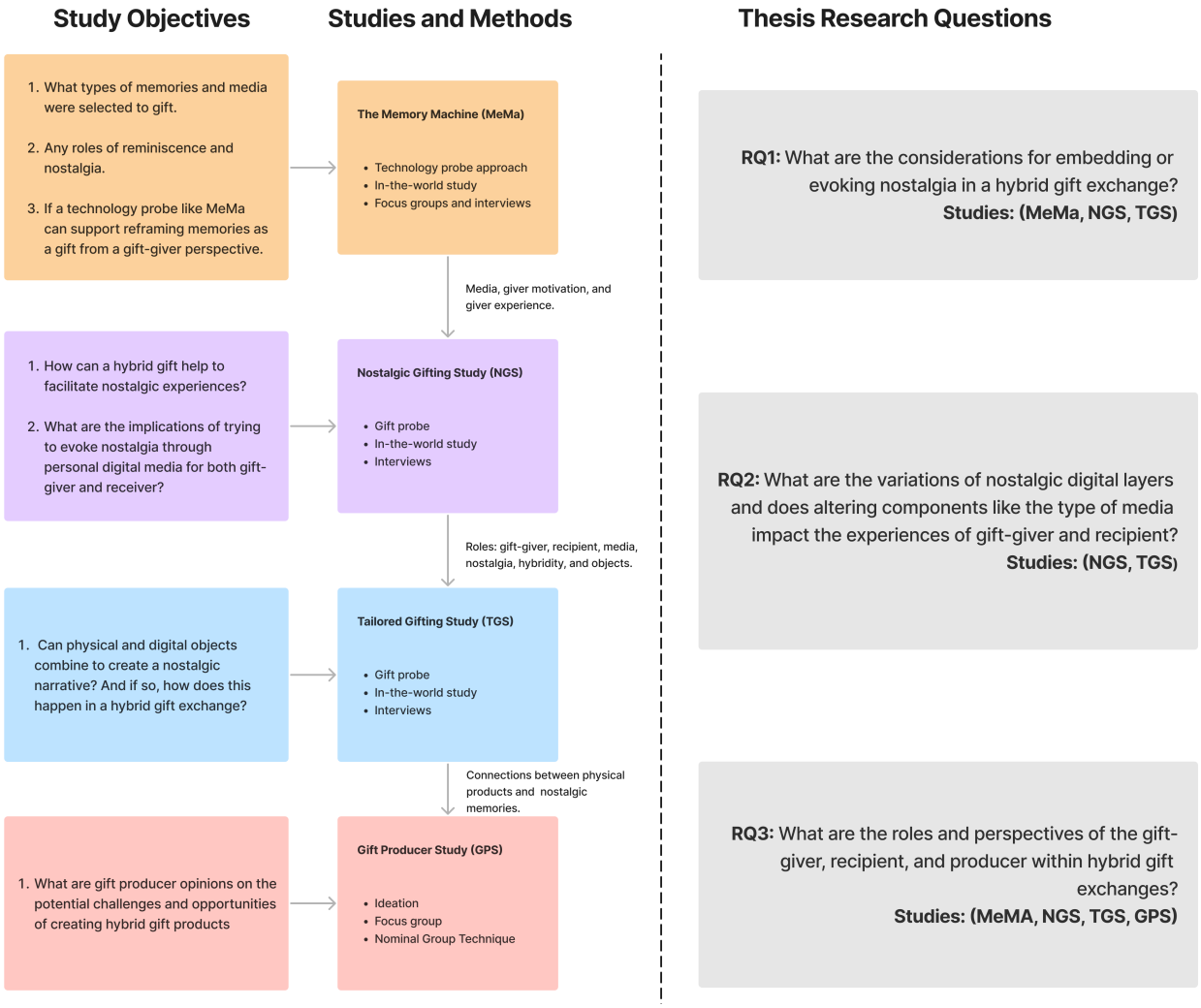


Figure 3.2: Link between studies

3.4.1 The Memory Machine (MeMa)

The MeMa was a tablet-based device to capture and store personal memories via media. The aim of the study centered on the idea of gifting, specifically with the motivation to uncover: (1) what types of memories and media are selected to gift, (2) any roles of reminiscence and nostalgia, and lastly (3) can a technology probe like MeMa support re-framing memories as a gift from a gift-giver perspective. Given

the desired aims, the study required an appropriate method to understand the gifts and media chosen, the motivation of participants, and generally the mediation of technology to support the creation of gifts.

The chosen approach for exploration was focus groups and 12 participants were recruited. As explained in 3.2.2, focus groups are a suitable method for group discussions (Gibbs 1997; Kamberelis and Dimitriadis 2013), gathering alternate viewpoints (Adams and Cox 2008; Smithson 2000), and for embedding activities to promote conversations (Spinuzzi 2005). Given the nature of topics on technology, gifting, and memories, a flexible and personal approach was required. The discussions were guided by the participants to some degree as this study centered around their experience creating a gift using MeMa and as Lazar, Feng, and Hochheiser (2017) state, focus groups can take an unstructured approach.

Given the flexible structure, a group discussion was viewed as an effective method to encourage participants to voice their opinions on what they had chosen to gift and why, but also how they found using technology like MeMa to create a gift. This format further enabled the capture of insightful and rich personal accounts that represent two different groups (older adults and families).

As mentioned in 3.2.2, there are disadvantages of focus groups and one which was found in this study was trying to find a time when all participants were available. Due to time constraints, one of the focus groups had to be adapted to take an interview format, with three individual interviews taking place and a final session with two participants able to attend at the same time. While interviews were not the intended data collection method, they did allow for in-depth discussions with participants. The format for the interviews followed the structure for the focus groups as closely as possible, each participant still got to present the selected memory they could envisage gifting and why it was chosen.

During the time of the study, the Covid-19 pandemic safety measures meant all focus groups and interviews took part online using Zoom. A university-approved auto-

matic transcription service was then used to generate transcripts, but all cleaning and anonymisation were completed manually by the researcher.

The data analysis for the focus groups and interviews followed a thematic analysis approach as outlined in 3.3. The process followed the Braun and Clarke (2006) stages for thematic analysis. The aim was to generate themes inductively and highlight participants' viewpoints on using technology for creating gifts of memories. As per the approach of Braun and Clarke (ibid.), the initial stages of the thematic analysis were carried out independently, with other researchers involved in the MeMa project helping with latter stages of defining and naming themes. Further, the analysis took a reflexive approach where the values, background, and assumptions of the researcher were considered before and during the analysis process (Braun, Virginia and Clarke, Victoria 2019). Full details on the study design are outlined in chapter 4.

3.4.2 Nostalgic Gifting Study

The Nostalgic Gifting Study involved 18 participants (9 pairs of dyadic relationships with one gift-giver and one recipient) taking part in a hybrid gift exchange (recruitment details are set out in chapter 5). As mentioned in section 3.1, the study took an adapted technology probe approach and used a simple *gift probe* to explore a new type of gifting within an already established ritual and context. The gift probe involved a box of chocolates and a QR code, that when scanned, presented a digital nostalgic memory from gift-giver to recipient. The study focused on two main research questions: (1) How can a hybrid gift help to facilitate nostalgic experiences?, and (2) What are the implications of trying to evoke nostalgia through personal digital media for both gift-giver and receiver?

The most appropriate method for exploration was deemed to be semi-structured interviews as outlined in section 3.2.1. As the study involved pairs of participants, the method of paired interviewing was evaluated, however as Marsh (2018) states they are suitable for discussing sensitive topics or when collaboration is a key part of

what is being explored. For this study, each participant had their own experiences as either a gift-giver or recipient. Therefore individual interviews were deemed the most appropriate for uncovering personal experiences and mitigated gift recipients feeling obligated to only give positive feedback in the presence of their giver.

Semi-structured interviews can elicit in-depth long answers from participants (Lazar, Feng, and Hochheiser 2017) about their preferences and experiences. Given the aims of the study, semi-structured interviews allowed for questions to probe what it was like to create or consume a hybrid gift that involved a personal memory whilst also affording flexibility to adapt or expand questioning when needed. The time of the study was during the Covid-19 lockdown measures meaning safety of participants was the priority. All interviews took place online using Microsoft Teams, automatically generated transcripts from Teams were then cleaned and anonymised manually.

After all 18 interviews had taken place, thematic analysis was used to generate themes from the data. To distinguish differing experiences or roles within hybrid gift exchanges, the analysis was separate for both gift-giver and recipient. The analysis took an inductive approach, no predetermined categories outlined the analysis, but research questions such as "How can a hybrid gift help to facilitate nostalgic experiences?" and "What are the implications of trying to evoke nostalgia through personal digital media for both gift-giver and receiver?" helped to shape the analysis direction. Similarly to the MeMa study, the process followed the phases for thematic analysis approach as outlined by Braun and Clarke (2006). The reflexive approach also continued, with recognition of the starting position of the researcher who conducted the coding. Full details and explanation of the study design and rationale are set out in chapter 5.

3.4.3 Tailored Gifting Study

This study involved gift exchanges between 9 pairs of participants with a gift-giver and recipient in each (recruitment details are set out in chapter 6). As set out in section 3.1, the study took an adapted technology probe approach and used a *gift probe* informed by findings from previous studies. In this iteration of gift probe, gift-givers were tasked to select a physical gift item of their choice (up to £25) and match it to digital nostalgic memories and media. For this work, a 'tailored' hybrid gift is defined as *a gift that represents identities, shared past, and distinctive traits of givers or recipients*. In short, it is a gift that is tailored to the individual with the likelihood being that they will find it meaningful. The study set out to explore if physical and digital objects can be matched or tailored to a recipient to convey a personal nostalgic narrative. The aim was to understand what products, media, and memories would be selected by givers and the emotional impact this may have. This is summarised in the following research question: "Can physical and digital objects combine to create a nostalgic narrative? And if so, how does this happen in a hybrid gift exchange?"

To explore these questions, the study followed a similar structure to the nostalgic gifting study presented in 3.4.2. Semi-structured interviews were deemed the most appropriate due to the desire to capture and understand individual viewpoints on the topic of hybrid gifting and nostalgia. Focus groups were evaluated however, nostalgia and gifts are personal topics and reservations were highlighted about the openness of sharing such experiences within unfamiliar groups.

Interviews were conducted online aside from one participant who was interviewed in person. Keeping the study online meant a wide range of participants could be accessed as opposed to just recruiting in the local area to the university. Similar to previous studies of MeMa in 3.4.1 and the Nostalgic Gifting Study in 3.4.2, this study followed a reflexive thematic analysis approach. One key difference from 3.4.2 is that both giver and recipient interviews were analysed together. The decision

for this was to build upon the established roles from previous studies and start to understand the exchange as a whole. While the analysis took an inductive approach, relevant literature was revisited to help with naming and defining themes. Chapter 6 outlines the approach and study design in full.

3.4.4 Gift Producer Study

This study brought gift producers together in person to distill previous findings from studies and capture their viewpoints on the concept of nostalgic hybrid gifts. This contributes towards considerations, discourse, and guidelines within this space. The main question explored in this study was: "What are gift producer opinions on the potential challenges and opportunities of creating hybrid gift products?"

To address this question, a focus group took part involving 3 individuals, each representing their business that sells, crafts, or produces gifting products. One part of the focus group focused on ideation activities as set out in section 3.1. This involved using resources to sketch and create ideas around hybridity and their products or to sketch out more general thoughts on the topic.

The final activity conducted in the focus group was a Nominal Group Technique (NGT) task. As mentioned in section 3.2.2, focus groups are a suitable method to capture the consensus of a group. Therefore, the closing activity was an adapted NGT activity to capture the 'top 5' challenges and opportunities of the hybrid gifting modality according to gift producers. This was adapted to take an open discussion format in the following steps:

1. Introduction to the task
2. Group discussion and debate
3. Researcher asks clarifying questions
4. Top 5 are written down by the researcher with agreement from all present

After the focus group had taken place, the automatically generated transcript was

cleaned and anonymised. As outlined in section 3.3, a thematic analysis approach was used to generate themes from the transcript. This involved a self-reflexive and mainly inductive approach. Having said that, relevant literature, especially in the consumer research space, was used to help with naming and defining themes. Full details of the gift producer study are outlined in chapter 7.

3.4.5 Conclusion

This chapter has outlined the chosen approaches for exploring various elements of gifting nostalgic memories via hybrid modality and has set out how each study has been informed (see Figure 3.2). To summarise, the four main studies of the Memory Machine, the Nostalgic Gifting Study, the Tailored Gifting Study, and the Producer Gifting Study all used a combination of the following methods and approaches:

1. Technology and gifting probes.
2. An in-the-world approach to research which takes place in real-world settings like participants homes.
3. Focus groups to gather group opinions on memories as gifts.
4. Individual semi-structured interviews to understand the in-depth experiences of gift-givers and recipients.
5. Ideation activities such as sketching to generate ideas.
6. A NGT to categorise and rank the 'top 5' challenges and opportunities of hybrid gifting.
7. Thematic analysis to search for patterns of meaning in data.

This chapter provided an overview of methods that have helped to create meaning from data and contribute to new understanding. In the forthcoming chapters, specific details are provided within each study.

Chapter 4

The Memory Machine Study

As our digital archives mature and grow, reflection on images, videos, and amassed digital possessions are becoming a means for revisiting the past in everyday life. Chapter 2 highlighted a gap in understanding if digital and physical possessions that represent memories can be transformed into a gift. Therefore, in this chapter, the design and deployment of "The Memory Machine" (MeMa) is discussed to explore the concept of gifting our memories digitally.

MeMa is a tablet-based prototype with the functionality to store and record digital memories. The aim was to explore MeMa within participants' homes, tasking them to create a gift using the prototype. Through focus groups and interviews, 12 gift-givers presented their memories and media they had chosen as a gift.

The purpose of this chapter is to explore the concept of **transforming media and memories into a digital gift** and explore any emotional impacts on gift-givers whilst they recall memories to create a gift. The aim is to use the findings as a basis for potentially integrating memories into the hybrid gifting modality.

This chapter is comprised of four main sections, firstly the objectives and approach will be outlined and will highlight specific literature that has underpinned the work. Following this, the development, design, and user experience of the MeMa will be discussed. Further, findings from thematic analysis of focus group and interview

data will be presented, and lastly, the chapter will conclude with a summary of the work and key discussion points to inform further chapters.

4.1 Approach and Objectives

The MeMa is an ongoing and iterative project. It is worth noting that the gifting focus groups and interviews discussed within this chapter were part of a wider study that involved a series of three topics (gifting, privacy, and usability). The development and design of MeMa was supported by the interdisciplinary MeMa project team. For this thesis, the sole focus is on data from the gifting topic. Whilst the development and design of MeMa was a collaborative activity, my main contributions were shaping the gifting focus group format by designing questions for the script, helping with the design of MeMa in group meetings, and data collection. I had sole responsibility for all the data analysis and write-up.

The MeMa aimed to build on the prior work of Price et al. (2019), where the idea of developing a device to capture and store personal memories was explored via workshops. Using findings from this workshop, the MeMa team wanted to develop a device that could be tested with people. The approach involved creating a technology probe (Hutchinson et al. 2003), which is defined as a prototype to understand how participants interact with technology, and in this case specifically interacting with a device in their home environments.

The MeMa probe was a tablet-based application that enabled participants to import their autobiographical memories using public and personal images, videos, text, and voice. The 12 participants were tasked to asynchronously create a gift using MeMa. The aim was to uncover:

1. What types of memories and media were selected to gift.
2. Any roles of reminiscence and nostalgia.
3. If a technology probe like MeMa can support reframing memories as a gift

from a gift-giver perspective.

To underpin the research, key definitions and types of memory were explored (set out in full in chapter 2 section 2.3.2). For this study, memory was defined as a way of storing and retrieving information that has been acquired through one's senses (Baddeley 1997). Further, types of memory include semantic and episodic, with the latter being autobiographical, and the former relating to knowledge about the world (Tulving 1993).

After understanding what is involved in memory and recall, examples of work that focused on technology-mediated reflection were used to understand the collection and transformation of media via prototypes (Odom and Pierce 2009; Odom, Banks, Kirk, et al. 2012; Odom, Wakkary, et al. 2019; Odom, Yoo, et al. 2020). For example, the work of Odom, Banks, Kirk, et al. (2012) focused on technology heirlooms and demonstrated how devices can be created to pass down digital materials between families. Further, other HCI studies (Nilsson, Johansson, and Håkansson 2003; Cosley et al. 2009; André et al. 2011; Sungkajun and Seo 2019) were used to understand how artefacts have been developed to support reminiscence or nostalgic emotions via technology, such as how media has been used to tell stories and evoke nostalgic emotions individually and between groups.

Moreover, as our digital interactions and repositories continue to increase, how media is used to support close interpersonal relationships is continually evolving. **It's commonplace for families, couples, and older adults to use technologies to maintain relationships through digital communication** (Hertlein 2012). For example, sharing media (photos, videos, voice notes, social media posts) via smartphones. From an HCI perspective, various technologies have been developed and explored to uncover ways relationships can be enhanced, supported, or facilitated via media. One example investigated relationships between grandparents and grandchildren (Vetere et al. 2009), the study involved sharing images and text messages. Findings demonstrated how intergenerational media sharing encouraged

playful interactions as opposed to serving a communicative purpose. Overall, digital repositories and media are deeply routed in societies and are key to sustaining relational connections, yet knowledge on gifting emotions via media remains limited.

Previous work on digital possessions was revisited to inform definitions and describe how virtual goods can transform into meaningful objects (Denegri-Knott, Mardon, and Wood 2012; Denegri-Knott, Watkins, and Wood 2013; Denegri-Knott, Jenkins, and S. Lindley 2020). Similarly, Van den Hoven, Orth, and Zijlema (2021) outline four connection types between possessions (physical, digital, or hybrid) and memories. For example, one type entitled *"memories expressed through possessions"* relates to objects as memory cues. Personal photographs would be a common example of this connection type. However, the authors highlight that digital versions of physical possessions may impact the association between memory and object, with it being more difficult to form attachments due to lacking physical material. Therefore, in this work, participants could render physical possessions into digital forms. Yet, it was unclear what types of memories gift-givers would select and why they may deem them a 'gift'. The discussed literature was used to inform how MeMa could begin to explore the concept of **transforming media and memories into a digital gift.**

Moreover, other works have focused on the use of a tabletop interface to enable sharing and narration of unsorted digital photographs (Apted, Kay, and Quigley 2006; Apted and Kay 2008). These works outline practically the interactions with digital photographs that users may make such as deletion, rotation, copy, and resize. In addition to the practicalities of photographs, West, Quigley, and Kay (2007) outlines a cultural probe study with elderly users and a system entitled Memento to support the creation of hybrid scrapbooks. A key element of these scrapbooks are photographs and findings from the study outlined how participants enjoyed being able to annotate digital images. Overall, there are several design options that combine different media types with photographs to aid reflection and other practical considerations of being able to edit and delete images.

In this chapter, the design of MeMa will be outlined. It is important to note that the initial design and concept was a physical machine to house both hardware and software. However, due to Covid-19 restrictions, the design reverted to a software-only solution. The remainder of this section will expand on the focus group/interview structure, data collection, analysis, and ethical considerations. Subsequent sections will discuss the process of creating MeMa, findings from the reflexive thematic analysis, and a summary of key discussion points.

4.2 Creating The Memory Machine

Creating MeMa was an iterative design process, which began with sketches based on findings from Price et al. (2019). Initial designs were created by research artist Rachel Jacobs (RJ), who was initially influenced by the design of popular children's toys which have a simple and bold design and utilise large buttons and dials. The incorporation of elements such as a large screen to view memories, a microphone to record audio, and buttons to record and view memories were deemed to be important elements of the MeMa. This was to encourage physical interaction with MeMa, resulting in a simple design that would lend itself to a wide range of participants with varying degrees of digital literacy (see Figure 4.1 for initial sketches).

Despite the initial motivation to develop a physical machine, the focus shifted to a software-based MeMa application due to Covid-19 pandemic restrictions. The application aimed to explore the use of MeMa within people's homes. To begin this process, RJ carried out a prototyping session with a potential end user who was an elderly member of their family, this was due to Covid restrictions which limited the access to other potential end users. The aim of this prototyping session was to rehearse how the MeMa might work in practice. The researcher used presentation software to set out media and memories (see Figure 4.2). The family member started with a 'linchpin', an initial photograph to act as a starting point, and then searched for other media to support this memory. This exercise triggered a searching activity

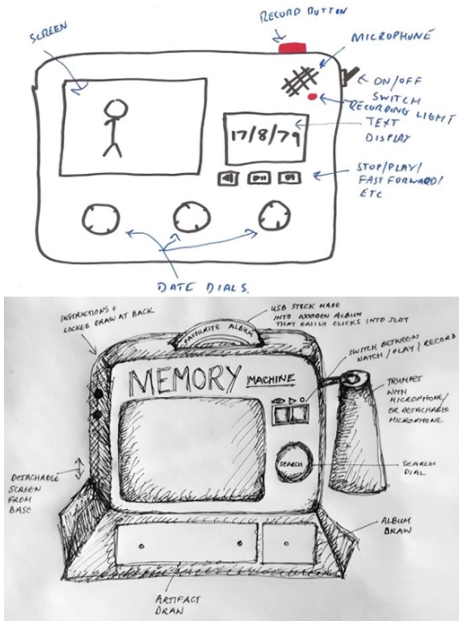


Figure 4.1: Early design sketches of MeMa

for relevant opera music and newspaper articles. The researcher discussed with their family member how these memories could be revisited once they had been created. Options included how images could be clicked on and expanded to show details or how icons could be created to play sounds. This led to contemplation on **the difference between creating a memory, experiencing it, and playing it back through the MeMa interface.**



Figure 4.2: Example taken from the user testing with researchers family member

Previous research and user testing helped to inform and shape the design of MeMa

in four key ways. Firstly, the idea of a 'linchpin' or cue for a memory could help with selecting a set of related media. Based on this, when the MeMa technology probe was deployed, it was suggested in the accompanying instruction manual that participants think of a memory from childhood as a starting point.

Secondly, the concept of a collage of memories was added to the design. A collage combines memories across time and finds undefined links between media. For example, the researcher's family member had memories from different periods triggered by hearing a lullaby. Therefore the 'collage' option was added to the prototype.

Thirdly, how the family member used a combination of voice recordings and text to narrate the memory. They discussed how the voice recordings might only be gifted to their granddaughter whereas the text narratives were less personal and they were happy for them to be viewed by anyone. It was noted that access to music and sound also had a profound and emotional effect which reinforced the importance of the MeMa capturing sound recordings.

Lastly, the user testing demonstrated a need to move between the creation of the memory and the playing of the memory. This helped when designing the prototype interactions. To build on the user testing, an iterative design process was used. This began with sketches based on findings from Price et al. (2019). Initial interface designs were created by RJ (see Figure 4.3) and the final design scheme and palette can be viewed in Figure 4.4.

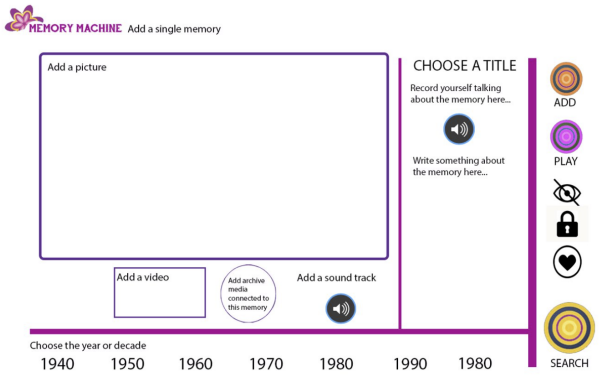


Figure 4.3: Iteration of MeMa interface design

After further discussions involving all researchers in the MeMa team, the features

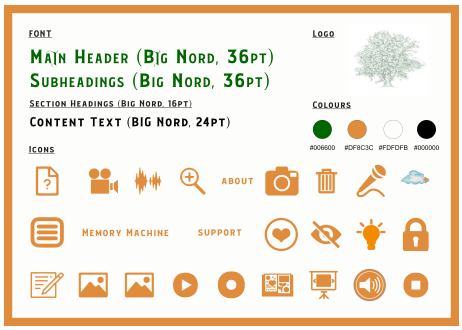


Figure 4.4: Final MeMa design scheme

and functionality of the application were agreed upon. RJ and developer Dominic Price (DP) then worked on creating the final interface. After the application was developed, it was downloaded to five Android tablets for use in participants' homes. The instruction manual was then created to help guide participants through the features of MeMa and outline the asynchronous focus group tasks. The tablet and manual can be viewed in Figure 4.5A.

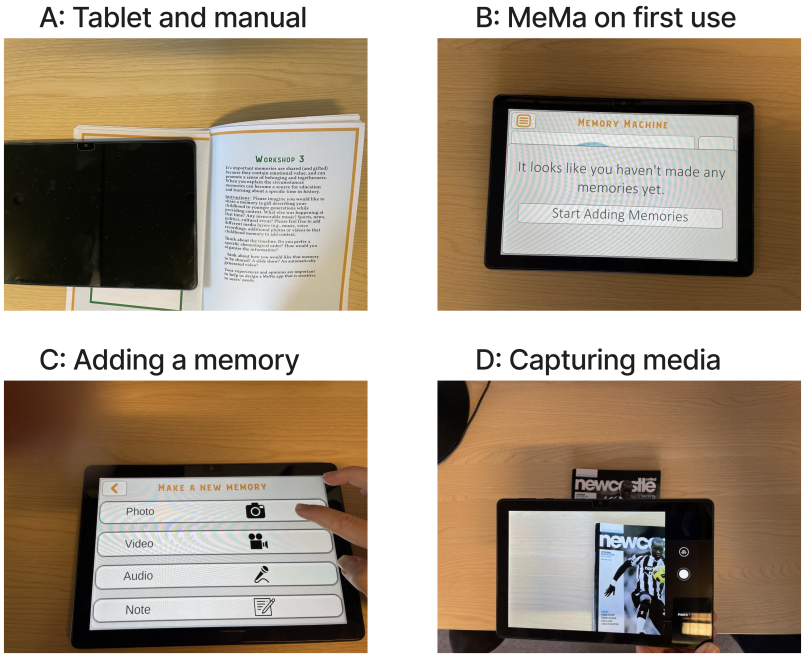


Figure 4.5: Initial phases of using MeMa

On first use of MeMa, a message appeared to show that no memories had been created and stored within the device yet, a button prompted users to start adding

memories (see Figure 4.5B). Within MeMa, users had a choice of four media types to capture and view: images, videos, notes, and audio (see Figure 4.5C), as per similar technology probe studies which combine various media types (Odom, Banks, Kirk, et al. 2012; Odom, Wakkary, et al. 2019; Nilsson, Johansson, and Håkansson 2003; Sungkajun and Seo 2019; Cosley et al. 2009; André et al. 2011).

To commit images or video to MeMa, users could use the built-in tablet camera (see Figure 4.5D). The MeMa aimed to be more than a repository for storing media. To reflect on the philosophy of slow technology, MeMa was not designed to just be'used' rather it was a probe to promote reflection in a slow manner. For example, the concept enabled users to add their narrative to autobiographical memories through a variety of media types. Thus, the functionality to import media from other sources such as social media and external storage was deliberately left out, although participants could take images of digital possessions using the camera. To further reflect on this 'slowness' MeMa was not designed to be a quick method to upload media from social media or camera rolls, instead it aimed to promote deliberate and intentional capture, which relates to slow design discourse (Odom, Banks, Durrant, et al. 2012; Hallnäs and Redström 2001).

It was further felt there were numerous technical and ethical considerations of the MeMa being 'online' and in this instance, the aim was to explore an offline solution, where media has to be manually captured instead of 'uploading'. Therefore, **the aim was to retain a sense of the MeMa being standalone and not connected to multiple devices or systems.**

Participants had the choice to create 'Album Pages' or 'Collages'. Album Pages enabled participants to display stored images, videos, audio, and notes together on a single page (see Figure 4.6G for a blank example of an album page), including the functionality to date individual media (see Figure 4.6E), and the ability to name an Album Page (see Figure 4.6H for an example album page along with a name for the memory). The combination of media types was to promote or encourage storied

reflection on photographs as per previous studies (Apted, Kay, and Quigley 2006; Apted and Kay 2008; West, Quigley, and Kay 2007).

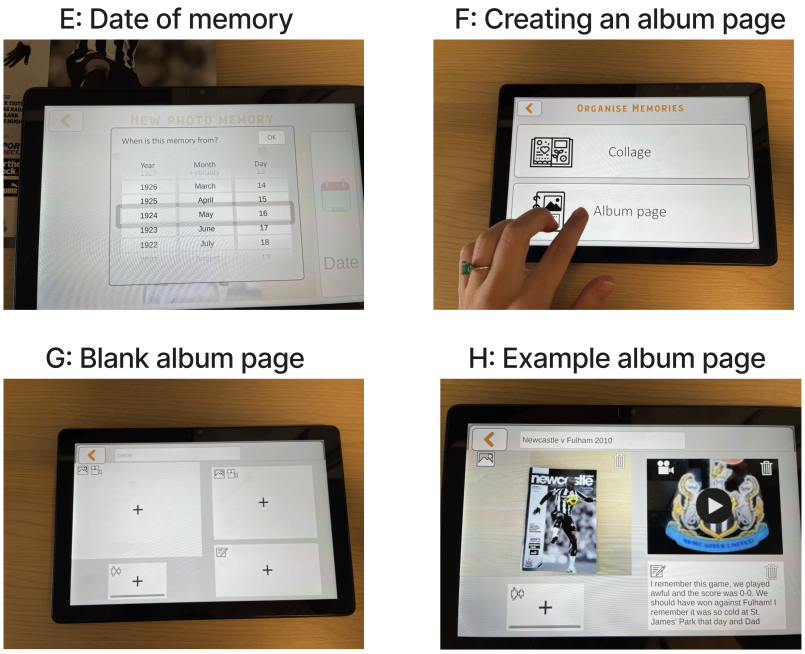
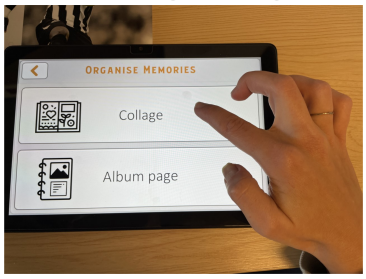


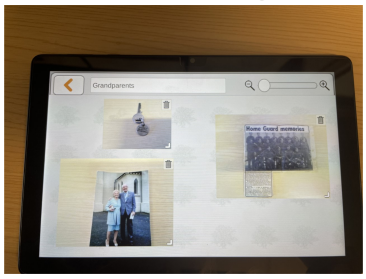
Figure 4.6: Creating an album page using MeMa

Collages could be used to display a range of memories from different periods, giving autonomy to the user to select various media types (see Figures 4.7I and 4.7J). Memories could be further viewed and organised via Collections (see Figure 4.7L) which could group memories created as Album Pages or Collages. Once two or more memories had been committed, they could be viewed within a Slideshow mode (see Figure 4.7M) where stored media would automatically play in a loop. Media could be deleted by selecting the delete button (see Figure 4.7N).

I: Creating a collage



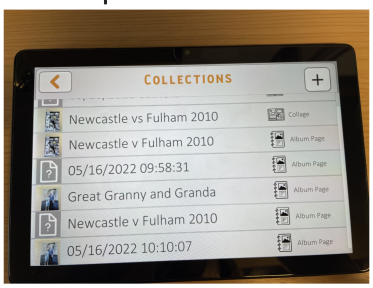
J: Example collage



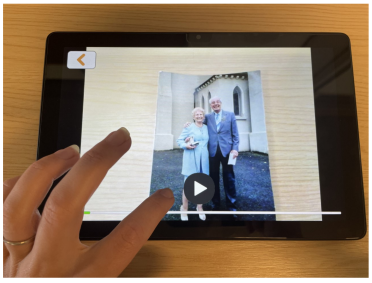
K: Example stored memories



L: Example stored collections



M: Slideshow mode



N: Delete memory option

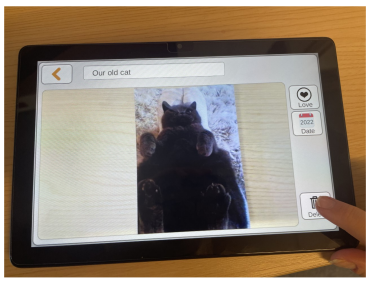


Figure 4.7: Creating a collage using MeMa

4.2.1 Participants

Due to lack of previous research in the space of gifting digital memories, this thesis starts at the beginning by engaging only with gift-givers. In total for the focus groups, 12 participants, including two sets of cohabiting couples (Participants 4A/4B, 5A/5B) were recruited. Focus groups were divided into two groups to uncover a range of experiences with users at different life stages. The two groups were older adults, and families (those with young children or young adults close to their family whom they would be inclined to share memories with). To clarify, participants in the family group were not related; they were individual users from different families. The justification for the older adult group is that this population is at higher risk of memory loss and cognitive decline (i.e., dementia) although MeMa was viewed as a reflective or learning tool as opposed to a 'therapeutic' one. This contributes to discourse within HCI of designing for the ageing population aside from accessibility purposes (Knowles et al. 2021). On the other hand, families were chosen to explore the dynamics of a more complex setting and to understand if MeMa can be used as a tool for promoting digital gifting within younger populations. Participants in the older adult group ranged from ages 61-74, with most being familiar with technology and owning a smartphone, however, some noted they did not use their phone every day and may require a small amount of assistance when completing tasks. The family group ranged in ages from 30-54, and all stated they use smartphones daily and they are comfortable with using technology.

Each focus group lasted on average for 1 hour and 28 minutes, with each participant having a period of one week to create a gift. An overview of participants can be seen in Table 4.1. All seven of the older adult group were able to attend the focus group at the same time. Due to time constraints and availability it was more challenging to replicate this with the family group. This resulted in the focus groups being adapted to take an interview format, with three individual interviews taking place and a final session with two participants able to attend at the same time.

Table 4.1: Overview of participants in focus groups and interviews

Participant ID (Focus group/interview no.)	Group
1 (1)	Older adults
2 (1)	Older adults
3 (1)	Older adults
4A (1)	Older adults
4B (1)	Older adults
5A (1)	Older adults
5B (1)	Older adults
6 (2)	Family
7 (3)	Family
8 (4)	Family
9 (5)	Family
10 (5)	Family

Recruitment of participants took place in the local area to the university (for ease of tablet delivery), through university newsletter call-out and by asking neighbours of the research team and in some cases participants asked others they knew if they would be interested in the study. Participants who were interested in taking part were directed to an online consent form (see Appendix A.1), where they could learn more about the research project via an information sheet (see Appendix A.2). Prior to consenting, there was an opportunity to speak with members of the research team to learn more about the project if required. After participants completed their consent, they were immediately directed to a contact information and demographic form (see Appendix A.3). Each participant received vouchers as compensation for taking part in the study with a value of £60, which were delivered to participants after the MeMa tablet had been collected.

4.2.2 Data Collection and Analysis

Before focus groups and interviews took place, each participant was provided with a tablet to use within their home alongside a physical copy of an instruction manual. The manual included details on how to use the application, such as how to add a memory, view memories in a slideshow, create a collage, frequently asked questions to

help with any technical issues, and provided space for any notes participants wanted to make during the study. The manual (see Appendix A.4 for example pages) also described the gifting activity they were expected to carry out. The activity promoted participants to think back to their childhood or prominent memories and how or if they would like to gift these to younger generations, thinking about what media to use and other events that happened in the same period.

The aim was to capture a discussion around the topic of gifting, thus the focus group dynamic would assist in gathering viewpoints, provide an opportunity for collaborative deliberation, and the sharing of perspectives on a common issue (Gibbs 1997; Kamberelis and Dimitriadis 2013; Smithson 2000). Further, Lazar, Feng, and Hochheiser (2017) comment on how focus groups allow for interactive elements via demonstration. In this case, participants were asked to show and discuss the media they had selected to gift and why, with semi-structured focus groups being an appropriate method to capture this. In those cases when an interview was conducted instead of a focus group, each participant was still provided with an opportunity to discuss what memory they wanted to gift, why they wanted to gift it, and who they envisaged gifting this to.

Focus groups were carried out online with at least two members of the research team present. One acted as the main facilitator, while the other assisted with technical needs. Sessions started with ethics reminders e.g. reminding participants of rights to withdraw and gaining verbal assent for their presence. A focus group guide was followed (see Appendix A.5) which included a discussion on how gift-givers would like to make their recipient feel when receiving a gifted memory and explicitly asked about nostalgia to explore any positive and negative emotions associated with creating this type of gift, as per the approach of Wildschut, Sedikides, et al. (2006) and Holak and Havlena (1992). Questions ranged from 'Do you think gifting could shape how you would like to be remembered?', 'How well can MeMa tell and share stories?', and 'Do you think your memories would be of interest to other people? and if so who?'.

Once all focus groups and interviews were completed, the automatically generated transcripts were cleaned and anonymised. The inductive reflexive thematic analysis process was then followed (Braun and Clarke 2006; Braun, Virginia and Clarke, Victoria 2019; Clarke and Braun 2018) (see Appendix A.6 for extracts of the process). The reflexive approach helped me to study the transcripts and generate initial data codes whilst recognising my starting position and beliefs that could potentially impact the findings: as the sole researcher who studied transcripts and generated initial data codes I recognised my background in technology, how I send and receive gifts often, and I do like to reflect and look back on my digital memories. Initial themes were then grouped and re-grouped, this process concluded by involving a researcher from the MeMa team (Camilla Babbage) to help with the naming and final grouping of themes.

4.2.3 Ethical Considerations

This work gained full ethical approval from the university's Computer Science Ethics Committee. Participants were informed on how their data, including mixed personal data, would be used and anonymised. As participants would be using a tablet in their homes and uploading their personal data (images, videos, audio, text), it was ensured that all tablets were wiped after use, but beforehand participants were sent a copy of any data so that they could retain their notes and memories. No data from the study was stored or kept, further, a member of the research team (Ayca Atabey) with a background in law read through the privacy statement and ensure it was easy to understand and added this to the consent forms. Additionally, signposting information was added to the information sheets for anyone who might have been affected, including relevant charities e.g. Alzheimers Society and The Samaritans.

4.3 Findings

Thematic analysis of transcripts generated three themes, Figure 4.8 presents an overview structure of themes and related sub-themes that will be discussed in this section. The themes are: considerations of using media to represent memories, outcomes and reflections on using MeMa to create a gift, and finally, practicalities of gifting memories. An overview of memories that participants decided to gift can be viewed in Table 4.2, the table presents a written description of each memory selected by participants, to whom they could envisage gifting this to, and the media they used to represent the memory. Predominately, memories involved family members, friends, events, culture, and memories relating to those who have passed away. It was noted that co-located pairs of participants decided to present just one memory jointly instead of one memory each.

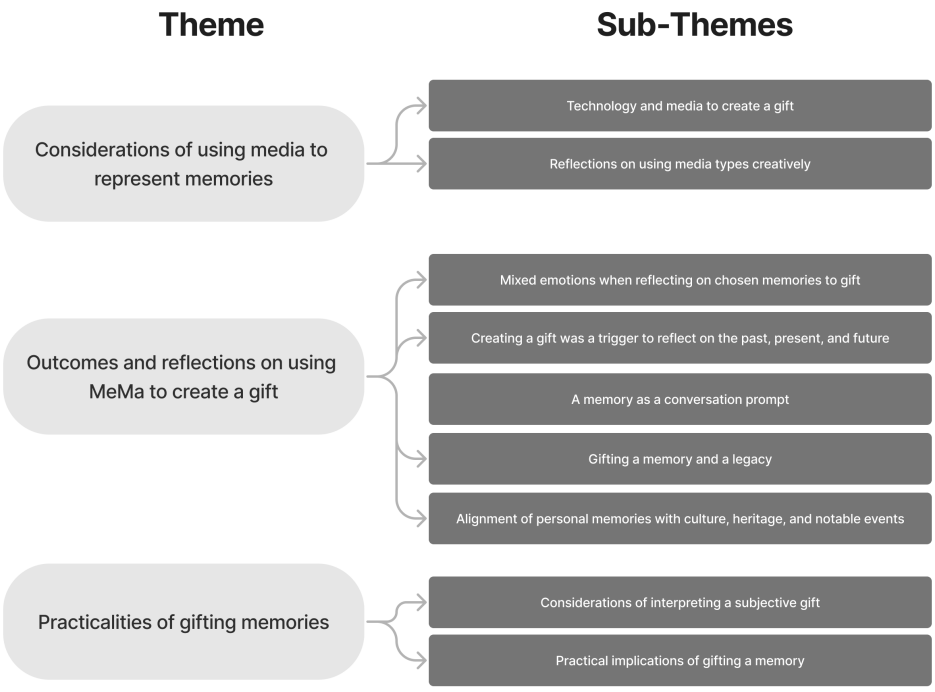


Figure 4.8: Overview of themes

Table 4.2: Overview of memories to gift

Memories selected to gift	Anticipated recipient	Media
Memories of their Father who died young, such as music he liked and what happened the year he died (moon landing).	Children and grandchildren	Video, music, text
Memory of their father playing a practical joke on them as a child.	Grandchildren	Image of themselves as a child
Social commentary of the 1970s/1980s, such as price of things, the fashion, music.	Friends	Photographs and music
Childhood holiday memories with their family.	Children	Image of a tent, car, and a poem.
Childhood memories, school days, and holidays.	Children	Text notes
Memories for their children of when and before they were born to show more about who their mother was before she had them.	Children	Images
Event of an earthquake in the country they are from and generally memories from the past 10-15 years.	Children and husband	Voice recording and music
Image of father-in-law who had recently passed away, an image they had originally been gifting themselves.	Children and future generations	Photograph
General memories and life experiences (going to nightclubs).	Child	Voice and images
Memories of childhood about their Mother.	Future children	Voice, images of Mum, video

4.3.1 Considerations of using media to represent memories

This theme was identified due to participants elaborating on their experience of curating, re-experiencing, and searching for media to form their gifts. This theme is split into two sub-themes of technology and media to create a gift, and reflections on using media types creatively.

Technology and media to create a gift: Participants (1, 2, 4A, 4B, 8) generally noted how technology can help with sharing media as gifts for loved ones. Participant 4A expands: ***"So, if I hadn't been able to do that digitally. I wouldn't have been able to share the photos with them"***. Participants 2 and 8 shared a similar view: *"[...] in order for me to share it as we do these days, you have to share it electronically. So I took a photo of it"* (8). Other participants noted the practical advantages of transferring large quantities of memories between families that are geographically far apart. Additionally, Participant 1 mentions how digital images can be edited and copied: *"of course, what they [grandchildren/family] can do is they can hone in on me and make me bigger in the picture [...] which they wouldn't be able to do with the picture in out of an album"*

Participants 7 and 9 discussed that while digital memories can be a permanent record, they also note how emotions and life lessons from these memories can also be gifted. Participant 7 adds: *"it changes the way that I think about life [...] to pass on to my children because, you know, maybe they can learn things [...]"*, and Participant 9 states: *"There's that sense of, what's that word? in solidarity and a shared experience"*. Overall, this sub-theme contributes to new understanding, advantages, and emotional impacts when using media and technology to create gifts involving a memory.

Reflections on using media types creatively: All of the participants mentioned the use of media to capture and document their lived experiences. Specifically, Participants 3, 4B, 6, and 7 all mentioned the powerful use of music, with Participant 7 adding: *"[..] music is definitely something that brings memory back[...]"*. Partic-

ipant 4B elaborates: *"Songs like King of the Road, Frank Ifield songs were played [. . .] so it's just to give us sort of like an impression of the 50s[...] you know, anything nostalgic, for the children"*. In particular, within the older adult focus group **when participants decided to play a song from their MeMa it sparked joy and conversation amongst the group.**

It was noted that participants (1, 2, 5B, 6, 7, 8, 9, 10) discussed the different media types they used and why, with Participant 9 discussing: *"I think that's why pictures are so important. Because you can see faces and expressions and the context of body language. You can evoke emotion"*. Similarly, Participant 6 states: *"I look at each picture. I remember the nights out [...] I think that for me that works very well. More than audio because videos you have to go and play it"*. Lastly, Participant 7 mentions: *"[..]* ***you can have music and voiceover and different layers. So, that's probably more dynamic"***.

Participants felt that creating a gift using MeMa was a creative activity and one which helped in being selective with media and memories (4B, 3, 9, 7, 1, 8). 4B elaborates: *"We're actually being creative. It's not just for the past but it's for the here and now [...] we're all being creative which [...] I mean,* ***we're all writing a book, aren't we?****"*. Further, Participant 9 mentioned: *"[...] creating a narrative, I think that you've got the options for voice clips, but actually pulling it all together for the person to talk about it would be a really amazing feature"*. Participant 1 further discusses how gifting memories from MeMa could help with being selective with media and memories: *"I can see the merit in small items and building on it over time rather than just simply going into a long diary of this happened this year [...]"*. In brief, this sub-theme outlines how overlaying media like music and text can be used creatively to tell a story.

4.3.2 Outcomes and reflections on using MeMa to create a gift

This theme was generated from the analysis due to participants reflecting on both their memories and experience of using MeMa to create a gift. It was noted within the older adults group there were evident joint reflections on the past with a sense of missing and longing for old times. This theme is divided into five sub-themes which focus on: mixed emotions, wider reflections, conversation prompts, legacy, and alignment of memories with notable events.

Mixed emotions when reflecting on chosen memories to gift: Within the focus groups and interviews participants expanded on emotions they felt whilst creating their gift and how they would want a recipient to feel if they were gifted the memory. This includes, **elements of sadness and loss when participants discussed loved ones who have passed away** (2, 4A, 4B, 5B, 8). Participant 4A elaborates: *"[...] both of my parents died when I was very young.[...] it would be wonderful if now I could pick up a tablet [...] that showed me what sort of person she [mother] was, what she enjoyed doing, how she met my father [...]* ***I would feel that it was a huge gift****"*. Whilst Participant 2 discussed a bittersweet memory with their father: *" [...] it just made me laugh [..] then when I think back now and unfortunately my dad died when I was 26 and I'm really really missing [him] still. And that was like over 40 years ago"*. Participant 8 adds: *"[...] now that he's [father-in-law] no longer with us, it's even a greater gift, really, because it's a true memory of someone who's no longer"*.

Participants (7, 8, 10) also discussed how they would hope to make a recipient feel from their gifted memory. Participant 10 discussed how they hoped it could convey effort and time spent creating an emotional gift. Whereas, Participant 7 wanted this to be an encouraging gift: *"[...] just encourage them to think in a more positive way about their life"*. Lastly, Participant 8 wanted their selected memory to bring happiness to their children: *"I think that would bring a lot of joy [...] and a lot of*

giggles". This sub-theme demonstrates that selecting a memory evoked bittersweet emotions but also anticipation of how givers would hope to make a recipient feel.

Creating a gift was a trigger to reflect on the past, present, and future: Creating a gift using MeMa triggered wider reflections on life experiences and the self. Some participants from the older adults focus group (3, 4B, 5B) specifically mentioned how this was a trigger to reflect on other memories. Participant 5B adds: *"one memory can lead to a whole lot of memories and in turn lead to another [. . .]"*. Participant 3 also states how creating a gift promoted wider reflection on experiences with their friends: *"it evoked lots of memories and thoughts that then a lot of our memories came from photographs"*.

Further, participants (3, 4A, 8) mentioned how creating a gift gave them the time to reflect on their life, with Participant 8 elaborating: *"We could make that time but of course we don't.* ***So as a gift it makes you stop and come and do it****"*. Participant 3 added: *"I was nostalgic when I was looking back on things [...]. It's making me, you know happy about just looking back and sharing in myself the memories"*. On the other hand, Participant 4A provides an alternative viewpoint, where they felt like in later years these documented memories could help them: *"[...] for dementia or Alzheimer's [...] it could be helpful to keep my memories alive"*. Therefore, this sub-theme highlights how the act of creating a gift can include a reflective activity as opposed to traditional modes of gifting that focus more on purchasing or searching.

A memory as a conversation prompt: Some participants (3, 6, 8, 9 , 10) noted how they wanted to gift specific memories to revisit a past time with others, Participant 3 states: *"I was thinking the memories I'd like to share [..] with my friends"*. Similarly, Participant 9 mentioned potential outcomes of gifting memories to their child: *"It's an opportunity for us to* ***connect with the past in the present****"*. This sentiment was shared by Participant 8, *"I like to go back [...] because I want to share it with people"*.

Gifting memories was viewed as a way to promote conversations between people (1, 3, 5A, 6, 8). For example, Participant 6 mentioned that curating memories on MeMa could be a joint activity between people. Participant 1 elaborated on how receiving an image from a family member promoted conversations, *"[...] this picture came to me from my sister [...] we all got it and all made comment [...]."*. Participant 8 further discussed conversations around the memory and media they had chosen as a gift: *"[...] my father-in-law gave me the photo [...] this also opened up a lot of conversations about other things [..], the topic of the war [...] but also music"*.

Lastly, the concept of gifting memories was also viewed as a way to open up about potentially sensitive or sad memories (1, 3, 6, 8). For example, Participant 3 stated: *"Like my Dad died when he was young [...] but I think by capturing them as a gift it gives then somebody chance to deal with that in their own way"*. Participant 1 felt that gifting via MeMa was a good way to bring up rarely discussed topics or people: *"My father died in 1969.[...] the gift is to our children because they never met him [...] So we don't talk about him [...] so this* ***[MeMa] is a good discipline to bring back that memory****"*. On the other hand, Participant 6 adds: *"some families already open and share all that anyway, so sharing a memory might just be a reminder of something they already know"*. Finally, Participant 8 felt that gifts were a good way to discuss lived experiences, *"We're not hiding things, we just don't talk about everything"*.

Gifting a memory and a legacy: Motivation for selecting specific memories ranged from wanting to preserve the past to passing on a legacy. Participant 2 felt this type of gift could be used to keep their father alive: *"[...] they [children] didn't really know him that well. [. . .] But then I like to talk about him to [...] keep the memory of him"*. Other participants (4A, 5A, 6, 7, 8) felt that gifting could contribute to family legacy, with 6 expanding: *"I want memories for my children. [...] But mainly my family, my husband"*. On the other hand, 5A reflected on how they feel a responsibility to gift memories: *"I think important for me, to pass things on because I'm an only child now, [. . .]"*. Participant 4A discussed how they would

like to leave a legacy of their memories: ***"I haven't got that from my mother, father, et cetera, so I'd like to do that for my children and for my grandchildren".***

Finally, participants (1, 5B, 7, 8) felt that gifting memories could help preserve the past. Participant 7 reflected: *"so it made me think about,* ***well maybe I should be recording more****"*. Similarly, Participant 1 mentioned how they would like to preserve the past for their grandchildren who would be able to have stories passed down to them if documented accordingly. Participant 8 mentioned how preserving the past and their memories could enable their children to feel nostalgic and *"take them back"*.

Alignment of personal memories with culture, heritage, and notable events: Mainly in the older adults focus group, participants (2, 3, 5B) tended to draw comparisons from past times to the present day. Participant 2 reminisced on a memory from their childhood when their father left a cardboard box out, *"in those days you never saw boxes or anything [...] it was quite unusual to see a box [...]"* and further reflected *"which in them days you went out to play with your friends and it was quite nice"*. Participant 3 reflected generally on how things have changed: *"It wasn't that long ago, but how things have massively changed. [...] comparing it to probably nowadays, so a lot simpler times"*.

Participants (3, 4B, 7, 9, 10) felt like gifting via MeMa could be a way to record factual information regarding their heritage. Participant 10 elaborated on traditions from their home country they could gift to friends, *"I can maybe for example in [home country] we have just special dance like traditional dance"*. Whereas, Participant 4B opted to include in their gift an image of an old car their parents used to drive and noted the transistor radio they listened to. An alternative viewpoint was offered by Participant 9 who stated: *"[...] if it would be possible to not just gift one's memory machine as a legacy to one's family, but also to like the British Library [...] to actually build up a body of cultural and social data"*.

Finally, it was observed that participants (1, 2, 3, 8) tried to align their personal memories with world events of that time. Participant 2 adds, *"Elvis Presley was number one record that year [...] the US entered the Vietnam War [...] while all that was going on, my memory that year was when I got up one morning and there was a box in the hallway"*. Similarly, Participant 3 mentioned *" [...] the first million pound footballer was Trevor Francis who went to [football team]. The average house price was £22,000"*. Participant 1 reflected on the image of astronauts they had decided to gift and how this related to their father's death: *"[...] a picture of the astronauts cause [...] my dad died in January and in July they landed on the moon in 69"*. Despite reminiscing on memories often resulting in comparisons and recall, this sub-theme uncovers how gift creation was the starting point which subsequently led to wider reflections.

4.3.3 Practicalities of gifting memories

This final theme was generated due to participants raising both ideas and limitations of gifting via MeMa, two sub-themes are presented: considerations of interpreting a subjective gift, and practical implications of gifting a memory.

Considerations of interpreting a subjective gift: Participants (1, 4B, 9) felt that it could be difficult for some people to accurately recall memories to gift, with Participant 4B adding: *"Some people have a more accurate memory than other people [...] you also gotta realise some people can express themselves better than other people"*. A similar sentiment was shared by Participant 1, *"[...] we actually remember things wholly different from what actually happened at the time [...] So it's quite normal that we changed the story to suit our storytelling as opposed to being detailed"*.

A further point of how or if we should gift sad memories was raised by some participants (1, 6, 8), with Participant 8 elaborating: *"[...] I don't want to put it down permanently, a negative memory. That's my initial feeling [...] well, they [chil-*

dren] could learn from it, [...] all depends on how you interpret negative memory" . Participant 6 further adds, *"You know that's just nature of it. But if you give something as a gift, well yeah it has to be happy. But* ***who would want to give a sad memory****"*.

Participants (1, 3, 8, 6) also noted how gifts are subjective and it depends on the person. Participant 1 comments: *"[. . .] you can't set it up and then say it's a gift and then make sure it is a gift.* ***It's up to them [recipient] to accept it as a gift isn't it?****"*. Participant 8 further mentions, *"The viewer has a choice [...] they could just turn it off"*, and similarly Participant 6 states: *"[...] for people you don't see often, it could be a nice gift [...],* ***but it just depends how you interpret gifts and who it is for I guess"***. Participants 9 and 10 perhaps allude to a way to counteract this subjectivity by involving something physical, or by gifting an entire memory machine. Participant 10 expands: *"Parents or just relatives. Maybe I can just give them the memory machine [...] I mean because if you touch it you can feel it and then it's gonna just make a connection [...]"*, and Participant 9 comments: *"it would be really lovely to have a beautiful object. You know? [...]* ***something tangible is just really important****"*. Notably, this sub-theme outlines giver thoughts, worries, and opinions about the subjective nature of gifting a memory recollection, as opposed to traditional physical gifting modalities where givers usually worry about how a gift item is received.

Practical implications of gifting a memory: Participants (3, 4B, 6, 7, 8, 9, 10) noted various practical considerations and limitations of using MeMa to create a gift. Participant 4B discussed the time implications, where it could take both effort and time to find images to form the gift. An alternative consideration was provided by Participants 6 and 8, who both discussed the digital literacy of the gift-giver and recipient, Participant 8 adds: *"Now I wouldn't gift anything to previous generations [...] So for example, I'm not going to send a link to my mother. It is just too complicated [...]"*. Participant 6 mentioned how rendering physical images into digital or taking an image of another screen may impact the quality of the image:

"I'll have to go into Facebook onto where I send my digital pictures and I can't really upload them, I can take a picture of my computer screen, that's not going to be good quality".

A further area of debate was how to organise memories. Generally, participant viewpoints varied with some preferring drag-and-drop options, and others suggesting a more linear approach to chronologically organise their memories and potential gifts. Participant 10 elaborates, *"Maybe keeping them like different folders? Or files. [...] Yeah, I think it should be just the basic drag and drop thing"*. Participant 9 shared an alternative idea, stating it would be interesting to visualise memories and how this could transform into a gift, *"[...] visualise memories like this would be would be really interesting [..]* ***way of being able to gift a lifetime of memories to somebody.*** *To be able to interrogate it in a different way".*

4.4 Discussion

The generated themes promoted reflection on framing personal memories as a digital gift, including how media can be re-purposed to create a gift and the **relationship between technology, emotions, and memories**. This section presents key discussion points and is split into town main sections of reflections on framing personal memories as digital gifts and, considering future digital gifting technology designs.

4.4.1 Reflections on framing personal memories as digital gifts

This section is split into two parts. The first part sets out the place of media and archives for creating gifts. The second, examines the relationships between memories, emotions, and technology and considers the impacts on interpersonal relationships.

Re-purposing media and archives to create a gift: prior works within HCI

have documented issues with organising, selecting, and distributing parts of our ever-growing personal digital archives (Vitale, Odom, and McGrenere 2019; Whittaker et al. 2012; Sellen and Whittaker 2010). Based on findings, one option to address this issue could be to frame parts of our archives as a gift. In this case, it's noted how the task of creating a gift tended to encourage participants to be selective with their media, resulting in what they deemed a valuable gift. To further reflect on this, work by Odom, Zimmerman, and Forlizzi (2014) was revisited, focusing on the concept of digital materials lacking form, rendering them "formless".

Formlessness in digital possessions is often due to the vast and disorganised nature of documenting and storing various media types. In the MeMa study, participants were able to overlay personal and cultural media to give "form" to a collection of media and **transform this combination into a rich new possession.**

Overall, the findings demonstrate how media can be a compelling medium to bring memories to life, yet it's still unclear how this practically could be sent to someone else. In the forthcoming chapters, the hybrid gifting modality will explore the transfer of these memories and objects between people.

Relationship between memories, emotions, and technology: Technologies and media are already recognised tools to support interpersonal relationships and communication (Hertlein 2012), despite many studies within HCI and beyond focusing on this area (Vetere et al. 2009; Shin et al. 2021; Wilding et al. 2020), there lacked understanding of how this communication may transform from sharing to gifting. Similar to works by Vetere et al. (2009) and Shin et al. (2021), common dyadic relationship types of grandchild-grandparent and parent-child were mentioned by participants. The analysis uncovered gift-giver motivations for using technologies like MeMa or media to tell a story to a grandchild, pass on their legacy to their children, and to preserve memories for future generations.

Part of the MeMa gifting study involved understanding the motivation of gift-givers when selecting a memory and media to gift. The analysis uncovered how some

participants wanted to tell a story, pass on their own or family legacy, and use gifting as an act of preservation. Prior HCI works have focused on the idea and embodiment of digital legacy (Odom, Banks, Kirk, et al. 2012; Thomas and Briggs 2014; Gulotta et al. 2013), as have psychology works (Bassett 2021; Savin-Baden and Mason-Robbie 2020). For example, Bassett (2021) discussed what happens with our persistent digital possessions after we pass away, findings from this study show that participants viewed gifting via MeMa as means of giving their memories to future generations. Further, MeMa was used as a way to gift the memories of late loved ones and in a sense keep their memory alive, resulting in a mixture of emotions from participants.

During both gift creation and focus groups/interviews a range of emotions were experienced: regret, loss, sadness, joy, humour, happiness, and empathy, all of which align with reminiscing or nostalgic experiences (Wildschut, Sedikides, et al. 2006; Holak and Havlena 1992; Havighurst and Glasser 1972). Previously, Whittaker et al. (2012) noted the importance of digital tools going beyond recall and findings demonstrate that **MeMa provided a creative solution to enable gift-givers to complete the gifting task whilst also supporting reminiscence and reflective cues.**

To understand these memory cues further, findings were expanded and related to Van den Hoven, Orth, and Zijlema (2021) work on memories and possessions. Participants' experiences with MeMa suggest that digital gifts comprising of personal memories align with connection type C2 "Memories expressed through possessions". Whilst concurring evidence was uncovered that participants could capture new and use existing digital possessions to represent and cue memories,**the lens of gifting is how this connection type practically manifested**. This began with participants mentally selecting a memory to gift, then they searched for appropriate media to bring it to life, which in most cases resulted in wider memory cues when viewing possessions. Based on this point, technologies like MeMa may indicate future ways and methods of framing gift exchanges, all of which could be a more fitting gifting

modality in our increasingly virtual societies.

4.4.2 Considering future digital gifting technology designs

This section takes a practical look at the considerations and implications for designing future gifting technologies, it is divided into two parts. The first, presents an overview of gifting digital memories and the relevant findings from the study of MeMa. The final part outlines four considerations based on this work and reflects on areas of capturing exchanges, technical possibilities, framing memories, and relationships

Key considerations for creating gifts of personal memories: A diagram to summarise the key points for creating digital gifts of personal memories can be viewed in Figure 4.9. The diagram highlights three main areas: media, giver motivation, and giver experience. Firstly, media involves a mixture of images, videos, text, music, and voice from public, cultural, or personal archives. Further, different dimensions or layers to gifts can contribute to a compelling narrative, for example playing music whilst displaying an image.

Giver motivation was a prominent area of this study's findings, example of motives ranged from storytelling, preservation, and communication. The media chosen was determined by this initial motivation which ultimately promoted selectivity and organisation. As seen in Figure 4.9, selectiveness impacts the type of media chosen due to giver motivation. For example, if a participant's memory was of their father who had passed away and their motivation was to start conversations with their grandchildren, this resulted in a selective activity to decide what media to use.

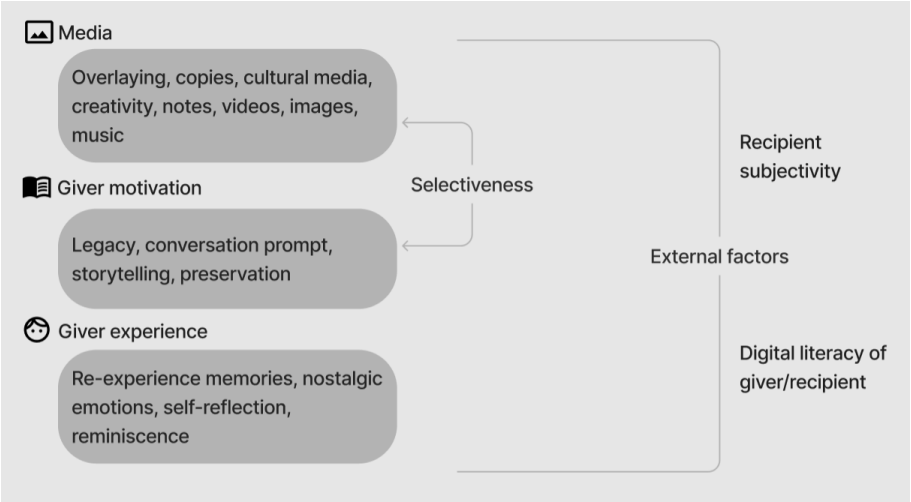


Figure 4.9: An overview of transforming memories into gifts

The third part of the diagram shows **how givers get to re-experience autobiographical memories when creating a gift for someone else.** This can result in multiple reflections on the self, people, objects, and places which can evoke nostalgic emotions (Sierra and McQuitty 2007; Wildschut, Sedikides, et al. 2006). Of course, all of the discussed areas come with limitations and drawbacks, many of which were raised by the participants themselves. These "external factors" are defined as aspects that can impact the exchange. These factors include the inherent subjectivity to classify an artefact as a "gift", where giver and recipient classification may differ. For example, in some cases participants noted the importance of having something physical to give, leading to a subjective external factor that could impact on exchange. From a more practical angle, the digital literacy of both giver and recipient could make these types of digital gifts inaccessible to create or consume.

Overall, the diagram encapsulates what is involved in creating a digital gift from one's autobiographical memory. **The three key areas of media, giver motivation, and giver experience could be used as lenses for exploration when designing future gifting modalities such as hybrid gifting.**

Future considerations for designing digital gifting technologies: The MeMa study highlighted four future design considerations in the digital gifting space.

Firstly, participants generally viewed this gift creation positively with some (Par-

ticipants 1 and 7) mentioning the study has made them realise they should be documenting and recording memories for others more frequently, yet there remains a challenge of how they can be gifted. Thus, **there is a significant design challenge of how the actual 'sending' of a gift from technologies would take place**. One participant (8) mentioned emailing a link directly from MeMa to their recipient. Whilst others (Participants 9 and 10) suggested gifting the physical device or pairing the memory with a tangible object, similar to hybrid gifting modalities (Koleva et al. 2020; Kwon et al. 2017), perhaps uncovering how gifting memories could take multiple formats in the future.

The second consideration is how to capture a gift exchange in its entirety. MeMa was an inquiry of gift-givers interacting with a device which could facilitate the creation of a digital gift formed of various possessions, media, and memories. Thus, the study did not set out to capture recipients' viewpoints. However, some participants (1 and 4B) did discuss their memories with others during the study with family members, providing some insight into how these gifts may be received. Therefore, **future work in this space could build upon these findings from gift-givers to design for recipient experiences.**

The third consideration is the framing of memories. Participants were asked to create a gift using MeMa and were provided with a prompt to think back to their childhood. **Having a prompt(s) or cue for participants encourages selectiveness and reflection**. In future designs, researchers could explore the idea of a 'linchpin' as mentioned within the user testing phase, which is a trigger or basis for a media-memory. Yet, it should be noted that framing or guiding users through these experiences is not always positive. Researchers should be cognizant of negative emotions associated with recall and reflection.

The fourth and final consideration is how interpersonal relationships leverage technologies and media. The study of MeMa is an example of going beyond the routine everyday capturing and sending of media between families. Instead, MeMa is a

'slower' technology, it is not instantaneous. Creating a gift involving media requires introspection and time from a gift-giver, who in turn anticipates strengthening interpersonal bonds underpinned by clear motivations (conversations, legacy, storytelling, and preservation).

4.5 Chapter Summary

This Chapter described how the MeMa (a tablet-based prototype) was designed and used to explore the gifting phenomenon. Specifically, this work set out to explore the concept of transforming media and memories into a digital gift and aimed to uncover the following:

1. What types of memories and media were selected to gift.
2. Any roles of reminiscence and nostalgia.
3. If a technology probe like MeMa can support reframing memories as a gift from a gift-giver perspective.

Findings from reflexive thematic analysis of interview and focus group data from 12 participants outlined the varying experiences, which were reflected in the following three main themes:

1. **Considerations of using media to represent memories:** The act of creating a gift and how media was viewed as a tool to create a permanent and creative digital gift.
2. **Outcomes and reflections on using MeMa to create a gift:** The motivations behind the gifted memory which included: a conversation prompt, legacy, and storytelling. Participants also emotionally reminisced whilst creating a gift, with some noting how this triggered other memories.
3. **Practicalities of gifting memories:** The broader context which could impact exchanges such as the digital literacy of either gift-giver or recipient.

Further, givers raised the challenge of subjectivity, where their recipient may not view a gifted memory as a "gift".

This in-depth inquiry involved gift-givers interacting with a device that could facilitate the creation of a digital gift formed of various possessions, media, and memories. Based on this, the key considerations, questions, and opportunities from the study of MeMa are as follows:

1. Layering media and having a multi-dimensional gift presents a unique opportunity to create new experiences.
2. The potential **importance of having something tangible** to hold within a gift exchange.
3. Memories can be used to create a gift but how that is transferred from one person to another remains unclear.
4. Whilst a gift-giver perspective has been captured, it's unclear how gifts of memory may be received from a recipient's viewpoint.
5. **Having a prompt or cue** for participants encourages selectiveness and reflection.
6. There are negative emotions associated with some memories, therefore gift exchange designs or modalities should be cognizant of this.
7. The impact gifting memories may have on interpersonal relationships and how technology might facilitate different types of communication via digital gifts.

Further exploration is required to fully understand exchanging memories as gifts, how both digital and physical objects could be used to create layers in gift exchanges, and the impact of nostalgic emotions on givers and recipients. The foundational understanding of provided by the MeMa study leads to the following chapter on creating a hybrid gift that explores the transfer of a physical object and a digital nostalgic memory between giver and receiver.

Chapter 5

The Nostalgic Gifting Study

Chapter 4 (MeMa) highlighted the potential value, relevance, interest, and intrigue of gifting our memories in a digital format. The findings from the study of the Memory Machine also outlined a requirement to further explore how gifts containing a memory are transferred in dyadic relationships, the viewpoints and experiences of gift recipients, and how gifts can include a physical object to support the exchange of nostalgic memories.

This chapter describes the *Nostalgic Gifting Study*, which used a simple prototype containing a chocolate box and a QR code to present a nostalgic digital memory. The research questions focused on two areas and were as follows: 'How can a hybrid gift help to facilitate nostalgic experiences? and, 'What are the implications of trying to evoke nostalgia through personal digital media for both gift-giver and receiver? Further, this chapter will expand on the process and design of the study, which involved the recruitment of pairs of participants to take part in hybrid exchanges.

There are four main sections to this chapter. The first elaborates on the chosen "In the World" approach and the relevant literature which helped to inform and shape the study. The second section details how gifts were created and the design of the study. The third section outlines findings from reflexive thematic analysis of 18 semi-structured interviews with gift-givers and recipients. The fourth section

presents discussion points on the roles involved within hybrid gift exchanges that evoke nostalgia and how emotions can impact the five-stage gift exchange model by Kwon et al. (2017). The chapter concludes by outlining a summary of the Nostalgic Gifting Study and the associated implications for future work.

5.1 An "In the World" Approach

The Nostalgic Gifting Study set out to explore the transfer of a physical chocolate box and nostalgic digital memory between pairs of participants with close interpersonal relationships. The aim was to uncover how evoking nostalgic emotions via repurposed autobiographical media might impact the experiences of both gift-giver and recipient. The research questions to be addressed were:

1. How can a hybrid gift help to facilitate nostalgic experiences?
2. What are the implications of trying to evoke nostalgia through personal digital media for both gift-giver and receiver?

As exchanges were taking place in this study, the fields of social anthropology (Sherry 1983; Mauss 1966; Lévi-Strauss 1944; Carrier 1991) and consumer research (Belk, Russell W 1988; Otnes, Lowrey, and Kim 1993) were visited to understand the exchange of commodities as gifts. Further, HCI works (Odom and Pierce 2009; Kalnikaitė and Whittaker 2011; Petrelli, Whittaker, and Brockmeier 2008; Golsteijn et al. 2012; Odom, Zimmerman, and Forlizzi 2014; Denegri-Knott, Jenkins, and S. Lindley 2020) that study digital possessions helped to inform what types of media are deemed valuable. Yet, many of these works focus on digital vs physical comparative studies, whereas, few studies have focused on blending physical and digital to create new experiences (Koleva et al. 2020; Kwon et al. 2017; Benford, Koleva, Preston, et al. 2018; Golsteijn et al. 2012). These studies were used to define and understand what a hybrid gift is. For this study, hybrid gifting is defined as **combining physical and digital objects to create a single gift.**

A key element of this work focused on nostalgic emotions. Multiple works (Wildschut, Sedikides, et al. 2006; Holak and Havlena 1992; Sierra and McQuitty 2007; Werman 1977; Routledge et al. 2012; Batcho 1995) define and describe the characteristics of bittersweet nostalgic experiences, for this study, nostalgia is defined as **a joy tinged with sadness** (Werman 1977). Specific studies in HCI (Nilsson, Johansson, and Håkansson 2003; Sungkajun and Seo 2019; Lustig, Konrad, and

Brubaker 2022; Brody, LeFebvre, and K. Blackburn 2020) have investigated nostalgic emotions and technology, thus highlighting the different environments and ways in which technology can be used to facilitate nostalgia. For example, in an elderly home setting, Nilsson, Johansson, and Håkansson (2003) installed an interactive table runner. When pressed it played music and new excerpts of the past to residents and evoked both positive and negative nostalgic emotions. Whereas, Sungkajun and Seo (2019) installed an interactive art installation that evoked nostalgia by displaying life stories through projecting videos onto a pond-like surface, with one participant stating it would make a **"great gift"** for someone.

Despite related work demonstrating how media can be used to evoke nostalgic emotions, this study differed in that it aimed to use personal autobiographical memories in home environments. Therefore, an "in the world" (Rogers and Marshall 2017; A. Crabtree et al. 2013; Ssozi-Mugarura et al. 2016) approach was adopted to capture everyday experiences of sending or receiving a gift. In this case, home environments were a suitable place for exploring a conceptual new gifting modality.

To explore the proposed modality, hybrid gifts consisted of two items. The first was a physical chocolate box and the second was a digital nostalgic photograph with an optional text note (justification for these choices are outlined in section 5.2.2). Dyadic relationships were invited to take part in the study (recruitment outlined in section 5.2.1), with each pair containing one gift-giver and receiver in each. Gift-givers created their gift online, through a process of selecting a flavour of chocolate (milk, dark, white) and uploading a nostalgic photograph of their choice, with space provided to add an optional digital text message. A QR code containing a link to a web page with the embedded digital content was then attached to a gift label on the wrapped chocolates. The gift would be assembled by the researcher and shipped to the chosen recipient. Both giver and recipient were interviewed separately, with 18 interviews being completed in total. Thus, due to the nature of the task and exchange activity of the study, an "in the world" approach was deemed the most suitable for exploration.

This chapter will outline the design and rationale for this study, starting with recruitment and data collection. Subsequent sections will focus on the study design, the format for the gift exchanges, findings from reflexive thematic analysis, and a reflection on findings. The chapter will conclude with a summary and expands on the relevance of the work for forthcoming chapters.

5.2 Gift Creation

This section will expand on the rationale behind key decisions for exploring this area. This includes, how participants were recruited, how gifts were created, design rationale for the digital layer and physical product, data collection and analysis, and ethical considerations.

5.2.1 Participants

In total, 18 participants were recruited for the study, consisting of 9 pairs exchanging gifts. Participants were recruited via word of mouth, social media, and email. The aim was to recruit participants who wanted or needed to send a gift the following month. Givers would usually be recruited first and they would inform their chosen recipient of the study.

Prospective recipients would be screened to ensure they had sufficient technology access, no food allergies, and were not classed as high risk during the pandemic (Covid-19). After passing screening, the ethics procedure for both giver and receiver could begin. Importantly, there was no compensation offered for gift-givers for taking part in this study, although recipients received their hybrid gift. The lack of incentives helped to ensure that genuine gift exchanges between pairs were captured.

An aim was to recruit a range of participants with varying relationships to each other and adapted recruitment accordingly when a level of saturation took place (Marsh 2018). For example, if there was repetitiveness within the findings or discussions. The main concern for recruitment was to focus on those familiar with technology

and those who needed or wanted to send a gift in the near future. Professions of participants ranged from speech and language therapist, personal trainer, truck driver, nursery school teacher, medical doctor, IT worker, and others including students and academics. Table 5.1 provides an overview of participants' relationships to each other. Relationships were self-defined in each pair by asking participants questions such as: "Who did you send the gift to? Tell me about your relationship" or "Who sent you the gift? Describe your relationship with them".

Most exchanges took place with gift-givers and recipients being located separately, with only one pair (8A/8B) being co-located. Due to Covid-19 restrictions there was no way to dictate a place of opening for the gift. Instead, gifts were shipped to the desired address of the recipient which was typically their home. There was no criteria to recruit pairs who were collocated or remote. Having said that, it is acknowledged that this design decision may have impacted the findings if all pairs were collocated as opposed to mainly remote.

Table 5.1: Overview of participant relationships.

Participant ID	Gift-giver	Receiver	Gender
1A / 1B	Cousin	Cousin	F / F
2A / 2B	Friend	Friend	F / F
3A / 3B	Girlfriend	Boyfriend	F / M
4A / 4B	Friend	Friend	F / F
5A / 5B	Sister	Sister	F / F
6A / 6B	Friend	Friend	F / F
7A / 7B	Father	Daughter	M / F
8A / 8B	Wife	Husband	F / M
9A / 9B	Friend	Friend	F / F

5.2.2 Creating a Gift

After screening and appropriate ethical consent had been completed, gift-givers were sent to a webpage created by the researcher that enabled them to create their gift. The webpage contained information such as a description of the finished gift that their recipients would receive. Respondents were asked to upload a photograph that would evoke nostalgic emotions for their receiver and instructions stated to think

back to a shared past or memory. Once participants were ready to create their gift they could press the button as seen in Figure 5.1. The button would then take them to a Google form where they could fill in details of their recipient's name, the type of chocolate they wish to gift, and they could upload their nostalgic photograph. The form would then be used by the researcher to purchase and assemble the gifts.

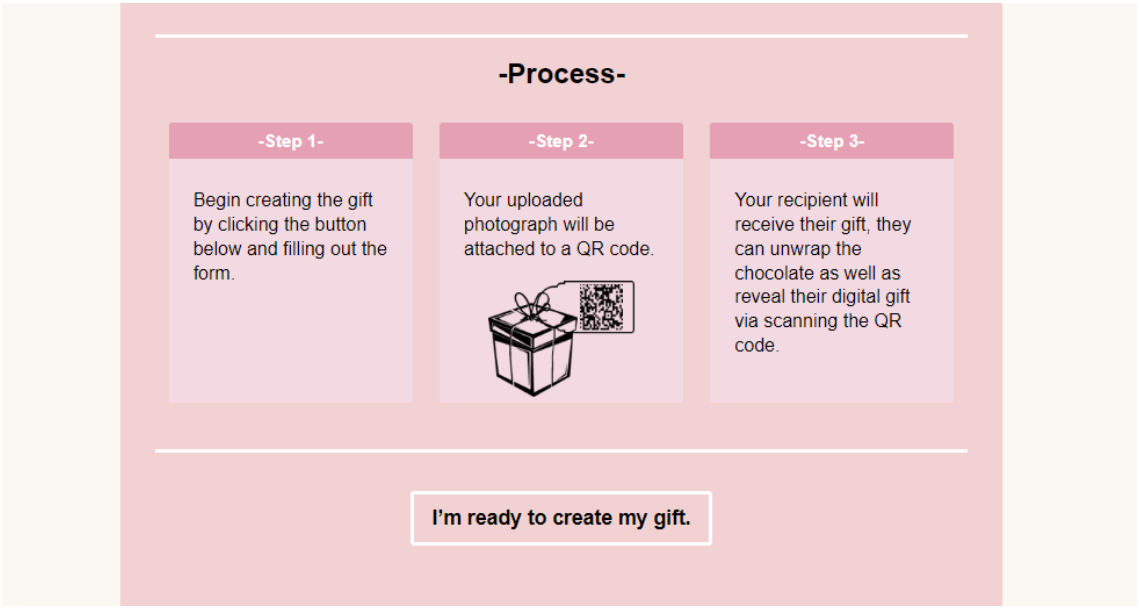


Figure 5.1: Webpage to create gifts.

As per other studies that involve nostalgia evocation (Wildschut, Sedikides, et al. 2006; Routledge et al. 2012), participants were also provided with the following definition of nostalgia from the Cambridge Dictionary when uploading a photograph: ***"A feeling of pleasure and sometimes slight sadness at the same time as you think about things that happened in the past"*** (Press 1995).

Rationale for the physical gift: Givers could select a flavour of chocolate ranging from dark, milk, or white. Chocolate is viewed as a conventional or typical gift (Camerer 1988) and the aim was to use a product that participants would be familiar with. As this work was exploratory, the physical objects givers could select were purposefully kept the same to uncover the range of memories that were chosen to go with one example product. A range of different products could have been used for this study. However, as a new gifting modality was being explored it was unclear

how having multiple different types of products could impact the aim of uncovering nostalgic experiences of gift-giver and recipient. Therefore, the physical object was important to explore the role of products within hybrid exchanges, but also that it remained consistent to support wider study aims relating to nostalgia. The cost of the physical item was also a consideration, with the selected chocolates costing £6.00 for four chocolates which were packaged in a box, all of which were purchased from a small independent chocolate company.

Once the gift-giver had made their selections for the gift, the chocolate was then wrapped in tissue paper and a gift tag displaying a QR code was attached to the wrapping, all of which was completed by the researcher. An example of the gift recipients received in the post can be viewed in Figure 5.2. Accompanying the gift was a sheet of paper that reminded participants to scan the QR code, but it did not dictate any order for doing so. Also stated on the sheet was a point of contact for any technical issues they may experience.



Figure 5.2: Gift package sent to recipients.

Rationale for QR code usage: This study used Quick Response (QR) codes to transfer text and images from gift-giver to recipient. A QR code is a square pattern that contains encoded information. They can transmit text, images, and website links. The QR code was printed and attached to a gift tag. Once the gift was

received, recipients could then scan the QR code to reveal their gifted photograph before or after unwrapping the chocolate box. A mock-up example of the nostalgic digital layer can be seen in Figure 5.3.



Figure 5.3: Example nostalgic digital layer.

QR codes were chosen as an appropriate technology to access the digital layer due to their ubiquity, familiarity in daily lives, previous use with physical objects, and ease of use for participants. Other technologies were evaluated such as Radio Frequency Identification (RFID) tags, which unlike QR codes can easily be 'hidden' although they could detract from the purpose of exploring nostalgic emotions. In brief, it was recognised that there are multiple technologies and ways in which the digital layer could be accessed, however, this study was based on an event of gift exchange in participants' homes. Thus, the design had to be **cognizant of barriers and potential impacts of unconsidered uses of technologies**. For example, if a participant had to download an application before 'unwrapping' their gift this may impact the exchange and emotions felt, the familiarity of a QR code solved this issue. It is acknowledged that there could be other ways to deliver or elongate the opening of the digital media but for ease of investigation, a QR code was used.

Rationale for the media and digital layer: Participants were asked to upload one image and had the choice to add an optional text message to accompany the photograph, which all nine givers decided to do. There was contemplation around enabling participants to add videos or music to their gifts, however, the aim was to retain focus on evoking nostalgic emotions. As the work was exploratory, it was unknown how having three or four types of media could impact nostalgic experiences. Instead, the aim was to understand if a **simple prototype** using two familiar digital media types could be exchanged via hybrid gifting modality. This relates to a slow design philosophy to design, to purposefully limit the concept to promote and invite reflection (Hallnäs and Redström 2001). It was further recognised that most participants would have either physical or digital photographs and the study could then capture where each participant searched for their media but also what type of memory they selected and why. Therefore at this stage, adding multiple media types could add complexity to questions surrounding evoking nostalgia in hybrid exchanges.

5.2.3 Ethical Considerations

This study gained ethical approval from the university's Computer Science Ethics Committee. All personal data has been anonymised to protect participants from being identified. Appropriate information about the study (see Appendix B.1) and its purpose was provided to all participants, including the risks of potential upset caused by nostalgia. Consent forms (see Appendix B.2) were completed by participants and checked before the study began.

5.2.4 Data Collection and Analysis

Once gifts were received and opened, interviews were arranged separately with each gift-giver and recipient, with all interviews taking part online due to Covid-19 lockdown measures. Interviewing each participant separately helped to mitigate against receivers only giving positive feedback (Marsh 2018) and contributed towards cap-

turing authentic responses about the gift exchange. In total, 18 interviews took place, with an average time of 32 minutes per participant. It is also noted that because data collection took place during the Covid-19 lockdown measures, some participants may have been more prone to reflecting or feeling nostalgic.

Interviews were semi-structured (Lazar, Feng, and Hochheiser 2017) meaning questions could be adapted when needed. Overall, questions invited participants to talk about their experience of being either a gift-giver or a recipient. Interview questions were based on the five-stage gift exchange model by Kwon et al. (2017), due to the model being created with both physical and digital gifts in mind. Nostalgia was explored in the interviews by discussing any feelings during the exchange, with a focus on establishing emotions associated with both good and bad nostalgic experiences (Holak and Havlena 1992). Other questions explored what participants reflected on, which helped to establish associations with the characteristics of nostalgic experiences, for example, places, events, or objects (Wildschut, Sedikides, et al. 2006). In addition, participants were asked about their proneness to nostalgia (Seehusen et al. 2013), i.e., "Are you someone who often feels nostalgic", which helped to explore any personality-specific traits that could impact the findings. The full interview plan and script for both gift-giver and recipient interviews can be viewed within Appendix B.3.

Following the completion of interviews, automatically generated transcripts were cleaned, anonymised, and thematically analysed (see Appendix B.4 for examples from the process). The analysis took an inductive approach and themes were generated from the data. Although no predetermined categories outlined the analysis, research questions such as "How can a hybrid gift help to facilitate nostalgic experiences?" and "What are the implications of trying to evoke nostalgia through personal digital media for both gift-giver and receiver?" helped to shape the analysis direction. The process for completing the analysis followed the Braun and Clarke (2006) 'phases of thematic analysis', where initial codes were generated, grouped, and regrouped to identify common themes. The initial coding of data was conducted by a

single researcher (Rebecca Gibson). A further data session and discussion, involved all supervisors in the analysis, enabled refinement of codes and themes. As per the reflexive approach of Braun, Virginia and Clarke, Victoria (2019), the starting position of the sole researcher who conducted the coding was considered. I'm a person who sends and receives gifts, someone who is moderately prone to experiencing nostalgia and enjoys interacting and using technology daily.

5.3 Findings

The thematic analysis outlines findings from both gift-giver and recipient interviews, which are presented in turn. Firstly, three themes from gift-giver interviews are outlined, which relate to their experiences of creating a hybrid gift. Similarly, three themes from recipient perspectives are detailed including their experience of receiving a hybrid gift. Each theme contains relevant sub-themes to expand and elaborate on captured experiences, See Figure 5.4 for an overview of themes. Table 5.2 details types of images and memories selected by gift-givers, images cannot be released due to the ethical implications of this and to protect participant privacy. Notably, only one participant (9A) decided to select an image with no people and was solely of a meaningful place to both themselves and their recipient.

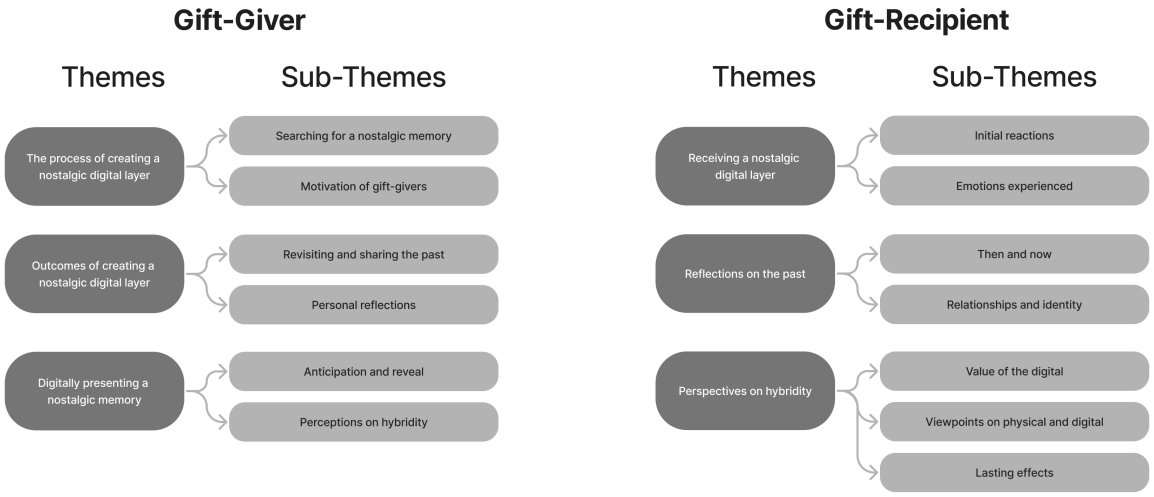


Figure 5.4: Theme overview of gift-giver and recipient experiences

Table 5.2: Images selected by gift-givers.

Participant ID	Image Description
1A	Family group at Christmas. Both participants and other family members present.
2A	A past birthday celebration of the recipient. Only the two participants present in the image.
3A	Image of both participants, outside a previous place of work for the giver.
4A	An image of a trip to horse racing, included both participants and other friends and family.
5A	Whole family photograph at another family members birthday party with both participants present.
6A	Image of a past night out, both participants in the image along with another friend.
7A	Holiday image, no giver present in the picture but recipient is with friends, family, and a pet dog.
8A	Image from the wedding day of the participants, only the two participants are in the image.
9A	Image of a holiday bar both participants like to go to, no people in the image.

5.3.1 Perspective of the gift-giver

Three themes generated from thematic analysis of gift-giver interview data are presented below, which detail viewpoints from givers on creating and reflecting on their experiences.

The process of creating a nostalgic digital layer

This is a theme because gift-givers spoke and explained in-depth the gift creation process. The theme is split into two sub-themes of searching for a nostalgic memory and motivation of gift-givers.

Searching for a nostalgic memory: Most givers (1A, 2A, 3A, 4A, 5A, 6A, 9A) spent time searching for a nostalgic memory and viewed this process as a prolonged activity. Examples included looking through social media or physical photo albums to find a compelling memory to gift. Participant 5A elaborates on their experience searching for a photograph to gift to their sister, *"[. . .] I spent the rest of the day going through all the photographs that I hadn't looked at for years, and I've actually brought some of the albums down."* A similar sentiment was echoed by giver 2A, *"So I went through 10 years of photos all the way back to college and I watched us grow up together."* A few participants (7A, 8A) felt they had an obvious choice of photograph, 8A explains: *"I mean immediately, I knew which photograph to use 'cause we've got one very classic wedding photograph [...]."* Similarly, participant 7A explained they had many images to choose from but they instantly knew they wanted to use a holiday image from their daughter's childhood.

Motivation of gift-givers: For the majority of givers (1A, 3A, 4A 5A, 6A, 9A) there was no specific event for sending the gift, but they generally wanted to send one because they missed a shared past and wanted to surprise their recipient with a pleasant reminder. Gift-giver 1A explained how due to Covid-19 lockdown measures, they were unable to see their cousin and this was a way of conveying a shared past and showing that they missed them via a gift. Further, 4A commented on their

motivation for sending their selected memory, *"For me I was thinking, let's send a picture of happy times and also sort of a reflection on our friendship and the time that we spend together."* Participant 6A shared a similar viewpoint and elaborated on their motivation to remind their friend of a fond past time: *"So, it was nice to know that I shared that with her and 'cause I knew that she would remember and be like oh yeah, that was a great night."* Gift-givers 2A and 8A discussed how their motivation centred around specific occasions, with 2A selecting a birthday memory of their recipient as it had just passed. Whereas, 8A selected a wedding memory due to it being close to their wedding anniversary.

Outcomes of creating a nostalgic digital layer

This is a theme because gift-givers reflected on how creating a nostalgic hybrid gift made them feel. The theme is split into two sub-themes of revisiting and sharing the past and personal reflections.

Revisiting and sharing the past: Participants (1A,4A,5A) stated how creating the gift was a trigger to reflect and look back on the past with others. Giver 1A (who gifted to their cousin) voiced how they had shown their selected photograph to their mother, who was also in the image, which prompted a conversation about the Christmas memory. Giver 1A further added: *"I guess it was something that I was even going to share on the family WhatsApp but then I wanted to wait until she [recipient] receives the gift* ***rather than send it over the internet right away****."* Participant 5A discussed a similar experience: *"[. . .] But I'd also sent loads of the pictures that I've found in the loft. I took pictures of them and sent round all the family so they've all had lots of stuff triggered off [. . .]."*

Aside from external sharing, participants (2A, 3A, 7A) mentioned the outcomes of sharing a memory with their recipient. Participant 2A discussed how they received emotional feedback regarding the nostalgic memory: *"[. . .] she's [recipient] not a very verbally emotional person and so when she messaged me she was quite emotional about it and said it was really nice and she really appreciated it, which was unusual*

for her." Further, 7A mentioned they had received a text message about the gift from their recipient (daughter) but anticipated their next phone call so they would talk about it more. Other participants (1A, 9A) similarly discussed their anticipation of discussing the gift the next time they speak with their recipients.

Personal reflections: Five givers commented on experiencing both positive and negative emotions throughout the gifting process (1A, 2A, 3A, 6A, 9A), with all five participants commenting on missing experiences and people due to the pandemic (Covid-19). Giver 1A expanded on the Christmas memory they selected to gift, and how it made them feel: *"[. . .] I really miss that, and it was such a lovely time we've all had together."* Participant 2A shared a similar view: *"[. . .] I miss going out with my friends, which is a thing of the current climate and not a thing in general."* As well as reflections, 6A noted wanting to recreate memories from the past: *"[...] we have a really good time when we see each other so, you know we need to do this again, recreate this [laughs]."* Whereas 7A reflected on mixed emotions regarding their daughter's childhood: *"[. . .]good feelings about that holiday specifically and sort of* ***happy memories*** *of their childhood". . . "The* ***sadness for me*** *is that their childhood flashed by so fast[. . .]."* Participant 5A explained they find the past painful to look at and further commented on the bittersweet emotions they experienced: *"[...] it was definitely* ***pleasure at looking at the photographs once I'd finished crying and laughing."***

Participant 4A felt this was a positive experience, and discussed how they created the gift after they had a bad day at work, which in turn improved their mood, and further reflected on their relationship: *"[. . .] kind of warm and secure in our friendship [...] and blessed in a way that we could draw on that particular experience."* Although this was not always the case, with participant 8A reflecting on how they only class specific memories as nostalgic: *"I don't really think of my memories with [recipient] as nostalgia."*

Digitally presenting a nostalgic memory

This theme highlights the implications of presenting nostalgic media in a hybrid gift exchange. This theme is split into two sub-themes: anticipation and reveal, and perceptions on hybridity.

Anticipation and reveal: As expected with gift exchanges participants often discussed a sense of anticipation they felt for their recipient to receive and unwrap the gift (1A, 2A, 3A, 4A, 5A, 8A, 9A). 1A adds: *"I was thinking how will she [recipient] feel? You know whenever she receives this 'cause it was a good memory for both of us."* Participant 5A hoped their recipient would enjoy the nostalgic memory and also stated how the novelty of a hybrid gift contributed towards excitement of "having something just a bit different". Participant 3A anticipated the whole gift being unwrapped due to the personalised element: *"I believe that because I couldn't customise it enough [the chocolates], I was not that excited about the chocolate itself. However, altogether with the message because* ***it was personalised I was excited for him to open it.****"* Participant 9A was indifferent and felt equal excitement around both the memory and chocolates being unwrapped, and 8A generally was more excited about the chocolates being received as they knew their recipient would enjoy them.

Perceptions on hybridity: Givers mainly felt excitement and anticipation over the digital gift as opposed to the chocolates (1A, 2A, 3A, 4A, 5A, 6A, 7A), and often remarked how the nostalgic digital layers elevated the chocolate and personalised the gift. Gift-giver 2A expands: *"So I really like the idea of being able to* ***give something fairly mundane, but make it personal.****"* Participant 4A had a similar outlook, although, their recipient didn't like the flavour of chocolate: *"[...] she really liked what I wrote more than anything and of course being reminded of that day. Turned out white chocolate wasn't the favourite, but it didn't matter."* Equally, Participant 6A was unsure what flavour of chocolate their recipient would like, however, they felt able to create a thoughtful gift via the nostalgic digital con-

tent. Further, 5A discussed their views on the digital part of the gift: *"[. . .] to have something personal added. I just think it shows a little bit more care and thought, just makes it* ***a lot more special.****"* A different angle was offered by Participant 8A, who elaborated on how they felt the chocolates were the most important part of the gift. They went on to discuss how chocolates are a welcome gift within their household, perhaps alluding to considerations of familiarity, rituals, and subjectivity which can be present within hybrid exchanges

Givers generally felt hybridity was important and sending both elements separately would have made the gift less special or thoughtful. Participants stated the importance of the chocolate with the digital layer (3A, 5A, 7A, 9A). Giver 3A commented: ***"Of course I could send it [image] like through a message or something, but it wouldn't be that special [...] without the chocolates for example."*** Whereas 7A leaned on the physical element to reinforce childhood memories of their daughter, picking milk chocolate as that was their favourite when they were younger. Participant 5A elaborated on feedback they had received from their recipient, showing that both elements together had an impact: *"She said she loved the photograph and she loved the sentiment. Yeah, she said the chocolates were yummy."* Participant 9A also thought the gift as a whole was important as they knew their recipient would like the chocolates, but the image and caption would bring amusement and meaning. Participant experiences demonstrate how both the physical and digital had their respective purposes within exchanges but also how the combination of objects contributed to meaning and thoughtfulness

5.3.2 Perspective of the gift recipient

Within this second part of the findings, three themes are presented based on analysis of gift recipient interviews, which include receiving a nostalgic digital layer, reflections on the past, and perspectives on hybridity.

Receiving a nostalgic digital layer

This is a theme because recipients reflected on what it was like to receive nostalgic media as part of a hybrid gift exchange. This theme is split into two sub-themes: initial reactions, and emotions experienced.

Initial reactions: Most recipients (1B, 3B, 5B, 6B, 7B) were initially surprised by the image and noted the scanning of the QR code. Participant 7B expands: *"I think also a bit of a surprise, I was kind of in a rush and when I opened it [QR code] and it just kind of made me* ***slow down*** *a little bit and yeah, got that nostalgic feeling."* A similar reaction was experienced by participant 4B: *"So I did scan the QR code which actually made me really smile and I said to my husband yesterday, that was the best part of the gift 'cause it had a picture of me and [gift-giver] [. . .]."* Participant 5B adds: *"[. . .] then of course up which I hadn't anticipated at all was up on my iPhone pops this lovely message. I was just blown away and [gift-giver] had chosen such a lovely picture."* Although most participants viewed the QR code as a welcome addition, participant 8B provides an alternative view: *"I guess my negative thought about it is I didn't really see the point, you know, the QR code seemed like an unnecessary use of technology."* Participant 6B stated in their initial reaction they saw the QR code as a replacement for a card: *"I liked the fact that you don't have to mess about opening a card and that you would just click on this [QR code] and that there's that lovely image of the girls [...]."*

Emotions experienced: For many participants (1B, 2B, 3B, 5B, 6B, 7B, 9B) this was a predominately positive gift exchange, although elements of sadness and bittersweet feelings were evident throughout interviews. This is demonstrated by 2B who commented: *"I felt quite happy but like kind of slightly bittersweet, because obviously with what's going on [Covid-19] Yeah, it was nice to have the message and be able* ***to see us together like we used to be****, but obviously it would be lovely to actually see her in person [. . .]."* Similarly, 1B commented on how they felt when they got the gift: *"I felt very loved when I got the picture [...] it was a*

nice message with it as well.", but later went on to state the image made them miss family: *"So I felt happy but then it was sort of like a little bit of, not homesick, but a little bit of sadness."* This sentiment was shared by participant 6B who stated: *"It made me smile and made me think well, I hope that can happen again sooner rather than later."* Further, participant 7B felt happiness in recalling a childhood holiday with slight bittersweet elements and added, *"I think as we didn't have as many holidays with him [giver] compared to Mum."* Finally, recipient 3B was apart from their recipient and mentioned the image and text brought back good memories whilst also missing them at the same time: *"**To some extent it felt as if she [giver] was here.**"*

Reflections on the past

This is a theme because recipients reflected on the past because of the hybrid gift. This theme is spilt into two sub-themes: then and now, and relationships and identity.

Then and now: Throughout interviews participants stated how they experienced wider reflections upon viewing the nostalgic digital layer, often on prior lived experiences (1B, 2B, 3B, 4B, 5B, 6B, 7B, 9B). Four participants (1B, 3B, 4B, 5B) specifically referred to pre-pandemic (Covid-19) times, and all described elements of longing for the past with a desire to recreate memories. Recipient 1B elaborated: *"[. . .] I was sort of appreciative of getting to see some people over Christmas and then I sort of missed it, **it made me nostalgic of older Christmases** where we could just very freely go to one person's house and have like twenty people."* Participant 2B reflected more generally on the past by adding: *"[..]it was a different time and I guess it was a happy time and we weren't as busy as we are now."*

Two Participants (3B, 6B) reflected on the self during the exchange, with 6B commenting on their physical appearance and how that had changed over time. Further, 3B revealed: *"[...] Of course, that time was very different to now. I was very different because it was more than one year ago, and I have a very different life. So,*

in terms of... social life I was making other friends, [...] even the way that I was dressing [...].”

Aside from self-reflections, participants (4B, 7B, 8B, 9B) experienced various thoughts on the past such as 7B reflecting on a family dog from childhood who has since passed away. Participants 4B and 9B both reflected on a particular place or trip, with 4B adding: *“[...] memories of the horse racing trips that we've done, and that particular trip when we were together for two days at [city name].”* Participant 8B reflected on their wedding day however they also stated that they don't long to go back to the day and are happy with that being a memory. The range of different reflections demonstrate how various memories can be presented through hybrid modality and the implications this has on reflective experiences of recipients.

Relationships and identity: All of the recipients discussed elements of a shared past, such as a wedding day (8B), family Christmas (1B), and holidays (7B, 8B). Part of this was reaffirming identities or relationship meaning. An example of representing identities included recipient 4B assuming the gift may be related to horse racing, a shared hobby with their gift-giver. Similarly, participant 9B anticipated the image would relate to holiday memories, as both giver and receiver have been on many holidays together. In those cases when recipients correctly matched their assumption to the gift they had received, it demonstrated shared meaning and understanding of identities between giver and recipient.

Aside from identities, relationship meaning is translated through the nostalgic content for recipients. Recipient 7B received an image from a childhood holiday with their father and went on to state how special those memories are. The giver in pair 7A (father) similarly stated the significance of those memories, meaning both giver and recipient confirmed their relationship meaning. Finally, participant 8B elaborated on how a shared past can be represented with ease but commented on the complexity of knowing what makes someone else nostalgic: *“[...] it's quite difficult to know for that other person what is truly nostalgic”*, which could be a challenge of

framing hybrid exchanges around nostalgic emotions.

Perspectives on hybridity

This theme highlights recipients views on hybrid gifts including three sub-themes: value of the digital, viewpoint on physical and digital, and lasting effects.

Value of the digital: Most recipients (1B, 2B, 3B, 4B, 5B, 7B, 9B) specifically mentioned feeling grateful because of the nostalgic digital layer, often noting the effort and time their giver had taken in selecting a memory. Participant 2B commented: *"I felt quite blessed to have somebody who would kind of in a sense take the time to do that [. . .]."* Equally, 5B shared: *"It's just one of gratitude and love towards my sister that she'd taken the time [. . .]."* Recipient 7B added: *"I felt quite grateful, like having family members in my life"*. Further, 3B commented: *"I really like what was written, I feel that in that it shows more effort to me"*. Finally, recipient 9B discussed their views on the effort behind personalisation, *"[. . .] it shows, I think more thought on the part of the donor or sender [. . .]. It means that instead of just buying something and putting in a packet and sending it,* ***it shows thought, doesn't it?****"*

Viewpoints on physical and digital: Notably, recipients generally had mixed feelings about the value of both the physical and digital objects. Firstly, four participants (1B, 2B, 4B, 5B) highlighted a preference for the digital layer. Participant 1B discussed: *"So I would say if they were to be sent separately,* ***the photo would probably be more of a gift than the chocolates because you know I can go out and buy the chocolates myself*** *[...]."* Despite there only being one choice of gift within this study, recipient 2B felt the chocolates could be changed for any product and elaborates: *"I think the digital side of it could go with any gift [...] you know* ***the chocolate was in a sense a bonus anyway.****"* Participant 5B elaborated on their view: *"I would think the digital 'cause that gave me the biggest smile. So when I scanned the code [QR code] [...] that was the best part."* Finally, participant 4B didn't like the flavour of chocolates selected however still felt the

nostalgic memory afforded a valuable gift.

Other participants (3B, 6B, 7B, 9B), found the digital gift brought meaning to the physical, implying **the hybrid form this gift took was important to them**. Participant 3B was excited to eat the chocolates but the meaning and sentiment of the gift came from the nostalgic layer. Participant 6B adds: *"What I liked about this was **I didn't know what was behind that QR code** and if I had the photograph, it would almost take the surprise element out of it a little bit[...]."* Recipient 7B commented on their viewpoint on physical and digital combined: *"[. . .] it's kind of quite nice to have something to hold [. . .] chocolates are kind of a gift in their own right aren't they? but it's kind of enhanced by having the photo [...] I just felt like maybe more effort has gone into it rather than just maybe someone picking up a WhatsApp message."* An alternative stance was articulated by participant 8B who commented on the use of technology and the experience as a whole: *"[. . .] I suppose mixed feelings there, a lovely gift, but I didn't really see how the use of technology added to the experience."*

Lasting effects: Opinions on keeping the gift tag and QR code differed, some participants anticipated cherishing it as a memento, and others felt it was unnecessary to keep due to the QR code itself lacking any personal meaning. The majority of participants (1B, 2B, 4B, 5B, 7B, 9B) stated they would keep the gift tag with the QR code. Participant 5B elaborated on their plan for the tag: *"I think what I'm going to do with this is put it in my art journal, as a little memento."* Similarly, recipient 7B displayed their gift tag on a pinboard. Participant 2B commented generally on keeping the tag: *"[. . .] I think people would be able to just keep a hold of it and have a look at it every now and again."* Participant 9B added they were going to keep the gift tag but was unsure of where they would put it. Participant 3B believed initially they may keep the tag but further went on to say they'll take a screenshot of the digital content and may discard the tag.

Two participants (6B, 8B) stated they would not be keeping the gift tag, and both

stated similar reasons for this decision. Recipient 6B remarked: *"Because it's a tag that says on it... 'QR code scan me' and that within itself doesn't really mean anything to me in terms of a visual. It's just a QR code."* This viewpoint is demonstrated further by 8B: *"There's no message on there to anything, so I can't see a purpose in keeping it in a memory box sort of thing."*

5.4 Discussion

This study set out to explore the questions: "How can a hybrid gift help to facilitate nostalgic experiences?" and, "What are the implications of trying to evoke nostalgia through personal digital media for both gift-giver and receiver?". The findings uncover various roles and implications of nostalgia within hybrid gift exchanges. This discussion reflects and outlines each role: gift-giver and receiver, media, nostalgia, and hybridity. Further, this section reflects on the implications of nostalgia relating to the five-stage gift exchange model as outlined by Kwon et al. (2017).

5.4.1 Roles and impact of evoking nostalgia within a hybrid gift exchange

Gift-giver and receiver roles: Clear roles of givers and recipients were distinguished from this study, to further reflect experiences are converged together into four areas.

1. **Reflection:** Both giver and recipient had a reflective experience. Givers spent time searching for a nostalgic memory whilst simultaneously self-reflecting on their lived experiences, extending to reminiscing on people (family, friends), events (Christmas, holidays, birthdays), and places (beaches, bars, university), all of which are associated with nostalgic episodes (Holak and Havlena 1992; Wildschut, Sedikides, et al. 2006). Similarly, recipients had their own reflective activity which was guided by gift-givers choice of media. For example, 1A and 1B both reflected on family at Christmas with each mentioning how they

longed for those past times. Therefore, **both giver and recipient engaged in similar reflections at different stages in the exchange** and in some cases together after the opening of the gift.

2. **Communication**: Gifting is an established method to communicate relationship status and meaning (Sherry 1983; Belk, Russell W 1988; Philp et al. 2016; Schwartz 1967), yet it's unclear if the same sentiment can be communicated via a digital media gift. In this study, givers leveraged both physical and digital objects to communicate a message to their recipient. For example, 7A selected milk chocolate as they knew their recipient (daughter 7B) liked that flavour as a child. Further, they (7A) used a holiday image to convey to their recipient how valuable those memories are. This was clearly communicated to 7B who shared similar sentiments with their Father (7A) regarding those cherished times. Thus, a recipient's role involves understanding the intended message behind both physical and digital objects. However, it should be noted that a nostalgic hybrid gift is not for everyone, with findings indicating that the giver must be well-familiarised with the recipient to lean on an extensive and documented shared past.

3. **Value alignment**: Givers and recipients reflected more on the digital nostalgic memory as opposed to the chocolates, however, for differing reasons. On one hand, givers anticipated their recipient scanning the QR code to digitally unwrap their selected cherished memory. On the other hand, recipients reflected on the surprise when viewing the media and valued the time and effort givers had put into the gift. Thus, both felt the emotional value of the digital layer outweighed the commercial value of the chocolates.

4. **An emotional exchange**: Both givers and recipients felt this was an exchange of objects and emotions, thus aligning with social exchange theory (Carrier 1991; Befu 1977). Givers viewed the exchange as an opportunity to remind their recipient of a positive pastime in which they may long for. For

example, 5A aimed to remind their recipient (sister) 5B of a pleasant family dinner, because to them it was a treasured and valued memory. This resulted in 5B mentioning how grateful they are for this reminder and expressed gratitude for their family. Further, as expected with nostalgia, a range of happy, sad, and bittersweet emotions were experienced (Batcho 1995; Holak and Havlena 1992; Wildschut, Sedikides, et al. 2006; Routledge et al. 2012). However, recipients explicitly mentioned they felt grateful for both their relationships and gift. In some cases, this gratitude leads to providing feedback, or anticipation of discussing the gift with the giver.

Media roles: When designing to evoke nostalgia, the use of both images and notes together provided context to gift recipients. This combination enabled compelling recollections of giver and receiver shared memories, as well as providing insight into giver motivations and intent. The use of multiple media types to evoke nostalgia is mirrored in prior HCI literature (Nilsson, Johansson, and Håkansson 2003; Sungkajun and Seo 2019; Odom, Wakkary, et al. 2019), where a mixture of videos, music, news excerpts, and images are utilised. Therefore, findings highlighted the importance of context for gift recipients and the need to afford gift-givers with a platform to represent their nostalgic narrative through media. To summarise, **the role of media enables gift-givers to tell a story and present a high-fidelity memory cue** for both givers and recipients.

The role of nostalgia: The first purpose of evoking nostalgic emotions within exchanges relates to a method of communication. Nostalgia is already regarded as an established communication tool within marketing, which is often a way for brands to communicate messages to their consumers (Merchant, LaTour, et al. 2013; Loh, Gaur, and Sharma 2021; Spaid 2013). Similarly, HCI studies have found that nostalgia can be a tool to form connections with others by using popular media types of videos, music, and photographs (Nilsson, Johansson, and Håkansson 2003; Sungkajun and Seo 2019; André et al. 2011). However, extant literature is devoid of capturing the use of autobiographical shared nostalgic experiences between two

people. Therefore, it's argued that **hybrid gifting is a valuable tool to convey relationships, emotions, and perceptions and thus for evoking personal nostalgia.**

The second impact nostalgia had on gift exchanges was the likelihood of the gift being well-received. Gifting literature has long debated what makes for a successful exchange (Galak, Givi, and Williams 2016; Dunn et al. 2008), and recently Branco-Illodo and Heath (2020) called for an exploration of what a successful digital gift may involve. Although this study did not set out to answer this question, the **findings suggest that the effort, thought, and gratitude that can translate via nostalgic media could mitigate against identified shortcomings of digital gifts**. A demonstration of this point is Participant 4B who received a flavour of chocolate that they didn't like but still felt this was a successful exchange because of the digital memory which it was presented alongside. To summarise, the psychological benefits of nostalgia, the effort from gift-givers, and gratitude experienced by recipients paired with the welcome addition of chocolates increased the probability of a successful gift.

Thirdly, evoking nostalgia elicited psychological benefits in givers and receivers such as well-being, self-esteem, and enhancing the meaning of life (Routledge et al. 2012; Wildschut, Sedikides, et al. 2006). However, as expected with nostalgia, (Wildschut, Sedikides, et al. 2006; Routledge et al. 2012; Holak and Havlena 1992; Batcho 1995) there were elements of bittersweet emotions including regret, sadness, and loss when participants viewed or selected a memory. As there were a wide range of emotions uncovered in this study, the question of how to carefully design and facilitate subjective nostalgic experiences through technology when experiences can differ from person-to-person remains. Recent CHI work (Lustig, Konrad, and Brubaker 2022) has started to address this area in the Recommender System space, however further exploration on exchanging increasingly bittersweet media and memories is required.

Lastly, nostalgia proneness is a debated topic within consumer research and psychol-

ogy, resulting in measures to quantify emotions and define them as a 'personality trait' (Pascal, Sprott, and Muehling 2002; Merchant, LaTour, et al. 2013; Batcho 1995). From this study, it was found that **digitally presenting nostalgic memories does not eliminate existing debates**. In fact, analysis of interview data found that participants had varying nostalgic experiences and findings align with nostalgia being a collection of subjective and personal emotions. Overall, **it's up to the gift-giver to deliver a considered message that is emotionally meaningful to them, in turn, promoting inalienable feelings and in some cases, evoking nostalgia in the gift recipient.** Therefore, when designing to evoke nostalgia in hybrid gifting it requires recognition that there is no standardised approach.

Role of hybridity: The findings show that both physical and digital objects have their respective purposes in hybrid gift exchanges. For example, nostalgic digital media affords clear and compelling motivations that translate from gift-giver to their recipient, often by re-affirming relationship meaning and identities through digital means. Whilst prior work (Schwartz 1967; Philp et al. 2016; R. W. Belk 1976; Carrier 1991; Sherry 1983) discusses gifting as a way to convey to others our perception of them, much of this previous work often focuses on physical objects, whereas a hybrid exchange affords identities to translate via digital as opposed to physical.

This does not mean the physical object becomes redundant in hybrid exchanges, in fact, findings align with Koleva et al. (2020) who state how a combination of physical and digital goods can be elevated into memorable user experiences. This study uncovered concurring evidence that **a hybrid model afforded memorable gift exchanges** and argue that the experience of both givers and recipients would have been different had physical and digital objects been sent separately. Further, digital gifts alone can struggle to convey sentiment or meaning (Kwon et al. 2017; Golsteijn et al. 2012), yet, in this study the digital part was the most meaningful which demonstrates the significance of the chocolates fulfilling the materialistic transaction

element often expected within gift exchanges, but the reliance is on the bittersweet nostalgia to bring the emotional meaning.

Further, Benford, Koleva, Preston, et al. (2018) discussed the prospect of particular products benefiting from hybrid forms; according to findings, the chocolates were elevated due to the nostalgic digital objects they were paired with. However, **it's unclear how versatile nostalgic digital layers are with other products aside from chocolate.** On one hand, the presented chocolate example may not be applicable to all gift-giving scenarios or cultures. On the other hand, the findings of this study do highlight the emotional potential and possibilities of merging physical and digital objects within gift exchanges. Therefore in future, **the type of physical object within nostalgic hybrid gifts should be a careful consideration**, as it remains uncertain how a higher value, or tailored nostalgic physical object may impact on nostalgic experiences. In parallel to this, the overall journey of accessing and interacting with a digital nostalgic memory should also be contemplated carefully.

It's recognised that digital gifts can struggle to convey sentiment or meaning (Golsteijn et al. 2012; Kwon et al. 2017). In this study, participants found the digital part more emotionally meaningful as opposed to the physical gift, yet the chocolates fulfilled the materialistic or commodity element, which are often expected within gift exchanges (Galak, Givi, and Williams 2016; Sherry 1983). Further, gifts promote a sense of ownership (Belk, Russell W 1988) and in this case, the chocolates provided the ownership via the physical object itself and as a vehicle to deliver the digital media. It is noted that a key part of a gift exchange is the surrounding social circumstances that can be elicited and maintained (Belk, Russell W 1988; Philp et al. 2016; Schwartz 1967; Sherry 1983). Based on this study, it's argued that the chocolates enabled participants to view the gift as a whole and as part of their social circumstance by promoting conversations with others.

In this study, participants accessed the nostalgic media via scanning a QR code,

which are a ubiquitous method for business-to-consumer communication (Ryu and Murdock 2013), notably being used in interactive smart packaging to distil product information (Lydekaityte and Tambo 2018; Abreu, Cruz Freire, and Losada 2012). Speculatively, the routine uses of QR codes perhaps influenced findings, with few participants unwilling to keep the QR code, because as a stand-alone 'thing' a QR code was not valuable to them. This uncovered a design challenge of finding **a balance between packaging, interaction, and personalisation.** In brief, a deeper understanding of creatively presenting and facilitating meaningful consumer-to-consumer communication is required, with acknowledgment of deliberate uses of technology that don't detract from nostalgic experiences but still encourage slow consumption to feed into the design of technologies that invite reflection as set out by Hallnäs and Redström (2001).

5.4.2 Nostalgia and the five-stage gift exchange model

To reflect on how a gift exchange was impacted by nostalgic emotions, the five-stage gift exchange model (Kwon et al. 2017) was revisited to understand how findings may align, impact, or change the current model (see Figure 5.5).

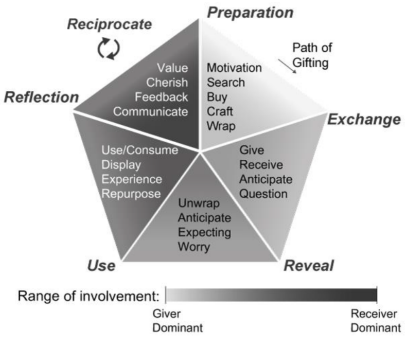


Figure 5.5: Five-stage gift exchange model(Kwon et al. 2017)

Table 5.3 provides an overview of suggestions and considerations about each of the five stages. Overall, gift-giver and receiver dominance levels through the five stages remain the same when nostalgia is involved in the exchange. However, the findings show that at times other people are involved in the gift exchange, such as family members who are physically present when recipients open the gift, or how gift-givers

discussed their nostalgic memories with those external to the exchange.

Table 5.3: How nostalgia impacts the five-stage model (Kwon et al. 2017)

Stage	Suggestions due to nostalgia
Preparation	**Sharing:** Gift-givers shared memories with others external to the exchange. **Self-reflection:** An activity when searching for a nostalgic memory to reflect on themselves, relationships, people, places, and objects.
Exchange	**Emotional response:** Feelings of sadness, happiness, joy, loss, alongside anticipation.
Reveal	**Interpretation and recall:** Gift recipients had to interpret the meaning of the nostalgic memory and some reflected at this stage on why it was chosen.
Use	**Save:** Gift recipients decide on keeping (screenshot) or displaying the gift tag in the home.
Reflection	**Gratitude:** Gift recipients reflected upon the gift and their relationships, resulting in gratitude for both.

Within the first stage of 'Preparation', expected elements such as motivation were observed, however, through findings, it could be argued that self-reflection and wider reflections were a key component in creating the gift. Such as reflecting on people, places, events, and objects. Further, during this stage some gift-givers decided to share their memories with others external to the exchange, thus differing from an exchange without nostalgia in mind.

Within the second stage of 'Exchange', the findings align with existing elements in the model, such as anticipation. However, the addition of nostalgia in the exchange uncovered the type of anticipation and emotional response encountered, which was generally excitement over their recipients viewing the curated media and memory as opposed to the physical chocolate box.

For the third stage of 'Reveal', gift-receivers had an additional task of interpreting the meaning of the nostalgic part of the gift, meaning they spent time viewing the content and in some cases reminiscing. It is also acknowledged here that eight out of the nine gift exchanges were remote with the gift-giver and recipient not being collocated. Overall, remote exchanges were successful with gifts eliciting a sense of presence for the gift-giver. For example, participant 3B mentioned how it felt

like their recipient was with them when they opened the gift. On the other hand, the one collocated exchange was not as successful with both the giver and recipient not feeling as sentimental about the gift. Thus, the reveal stage demonstrates that remote gift exchanges perhaps contributed to the meaningfulness of the gift and increased its value because giver and recipient were not together at the time of opening.

Within the fourth stage of 'Use' expected elements of re-purpose and display were observed but not in the traditional sense. For example, some participants opted to screenshot the digital layer and save this on their device. As the chocolates were a consumable item it meant **the lasting component of the gift was the digital memory** as opposed to physical gift, thus recipients 'used' their chocolates by consuming them but 'kept' the digital media.

Finally, for the last stage of 'Reflection' it could be argued that nostalgia shaped the type of feedback from receiver to gift-giver, which was often to do with recalling a shared past together. Further, recipients also reflected on their relationship with the giver and often specifically mentioned gratitude and being grateful for both the gift and their relationship with the gift-giver.

The additions to the five-stage model demonstrate how nostalgia and hybridity impact upon exchanges and experiences of the giver and recipient. These findings have helped in developing a definition of nostalgic hybrid gifts, which at the beginning of this chapter were defined as, *a gift that intends to create nostalgic emotional experiences.* Learning from participant experiences the definition has expanded: ***A modality of gifting which enables the transfer of shared memories, relationships, gratitude, and a physical object which results in emotional bittersweet recall for both giver and receiver.***

5.5 Chapter Summary

This Chapter set out to build on considerations from the study of 'The Memory Machine' (chapter 4), which highlighted the considerable gaps in: how to effectively use media to create new gifting experiences, involving tangible objects and digital media in a gift exchange, and lastly, how to transfer memories as gifts in dyadic relationships. Motivated by these unanswered questions, this study used a simple, hybrid gift prototype to explore gift exchanges of digital nostalgic media and a chocolate box between 9 pairs of participants.

The study aimed to explore:

1. How can a hybrid gift help to facilitate nostalgic experiences?
2. What are the implications of trying to evoke nostalgia through personal digital media for both gift-giver and receiver?

The key takeaways from the findings are:

1. A hybrid gift exchange involves multiple roles including giver and recipient, media, nostalgia, and hybridity. All of which serve a purpose within hybrid gift exchange.
2. Nostalgia impacts the five-stage gift exchange model (Kwon et al. 2017) with elements of self-reflection, interpretation, saving, and gratitude being incorporated within an exchange involving nostalgia.
3. The definition of nostalgic hybrid gifts can be elaborated to mean, **a modality of gifting which enables the transfer of shared memories, relationships, gratitude, and a physical object which results in emotional bittersweet recall for both giver and receiver.**

The study of the Memory Machine (chapter 4) highlighted the gift-giver perspective on the concept of gifting digital memories. The study further outlined gaps in knowledge surrounding the recipients perspective and the potential role of physi-

cal objects in exchanges of memories. To address these areas, the Nostalgic Gifting study presented in this chapter has extended knowledge on hybrid gifting by capturing and presenting gift-giver and recipient viewpoints. The specific roles involved in a hybrid gift exchange and amendments to the five-stage gift exchange model (Kwon et al. 2017) contribute to reflection and understanding on how re-purposing **our growing digital archives and digital memories can be integrated to form part of a considered hybrid gift**.

Having said that, this chapter has also uncovered new areas for further study relating to the following areas:

1. Participants stated that they enjoyed the chocolates and they were a bonus to receive, yet it remains unclear the value that a nostalgic digital layer would have when the physical gift is chosen by the giver and not predetermined by the researcher.

2. The media types were limited to two types, with it remaining unclear how the use of music or videos could impact nostalgic experiences, with some participants stating that music is a nostalgic trigger for them.

3. To better understand how a hybrid modality may mediate gifting social practices or rituals.

Overall, a further study could help to deepen the understanding of nostalgic experiences of gift-giver and recipient in hybrid exchanges. The forthcoming chapter will investigate what happens in these exchanges when key components are altered and more freedom is given to the gift-giver to determine both media types and the physical object.

Chapter 6

The Tailored Gifting Study

In chapter 5, the study focused on one physical object (chocolate box) and one digital representation of a nostalgic memory (image and text), with participants exchanging relationship meaning, sentiment, and storytelling via hybrid modality. Reflection on this led to the development of the *Tailored Gifting Study*, where it was questioned **what happens if a gift-giver could select any physical object they want**. Or, could nostalgic narratives be enhanced if givers could upload music or videos? What if a hybrid gift could be *tailored* to better reflect the giver or recipient?

This study set out to understand what objects would be chosen when the gift-giver could select a gift item of their choice and does this have any impact on giver and recipient nostalgic experiences. The main research question this study aimed to address was: *"Can physical and digital objects combine to create a nostalgic narrative? And if so, how does this happen in a hybrid gift exchange?"*

This chapter comprises four main sections. The first, outlines the basis for the study concerning previous chapters and extant literature. Further, the section highlights participants, how gifts were created, ethical considerations, and data collection and analysis methods. The second section sets out the findings from a thematic analysis of 18 semi-structured interviews. The third highlights the implications of findings

and summarises the key discussion points. The fourth and final section summarises the chapter.

6.1 Approach and Motivation

This study focused on gift exchanges between pairs of participants with a gift-giver and recipient in each. Adopting a similar gift probe approach used in chapter 5, gift-givers were tasked to select a physical gift item of their choice and choose digital nostalgic memories and media to go with it.

For this work, a 'tailored' hybrid gift is defined as ***a gift that represents identities, shared past, and distinctive traits of givers or recipients***. After careful consideration and reflection on the gift probe methodology used in chapter 5 this study changed two components. Firstly, the physical object could be selected by the gift-giver and secondly, they had the option to embed a YouTube video as part of their gift. The aim of changing these components was to understand what objects would be chosen, the impact of giver and recipient nostalgic experiences, and if or how objects would be linked to tell a nostalgic narrative. The main research question this study aimed to address was *"Can physical and digital objects combine to create a nostalgic narrative? And if so, how does this happen in a hybrid gift exchange?"*

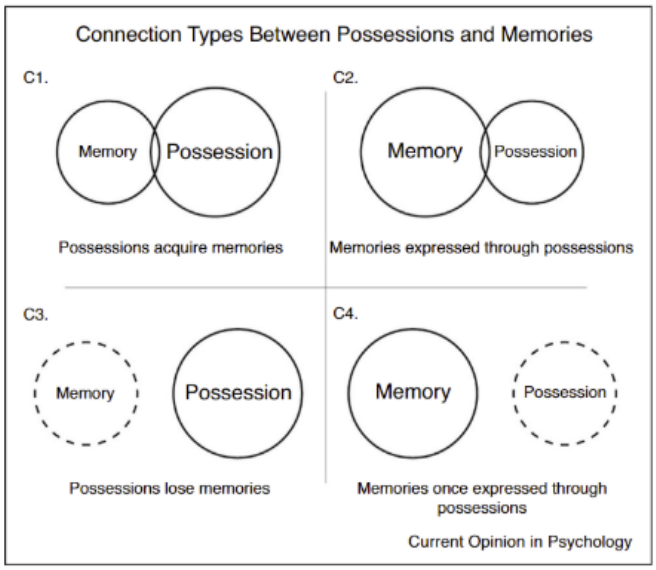
Motivated by this question and the design concerns highlighted from the gift probe in chapter 5, this chapter aims to address the physical gift item and the media types that are presented. To justify these choices, findings from chapter 5 showed how participants perceived the physical gift of chocolates as a bonus and they tended to view the digital layer as the 'best part' of the gift. In two cases from chapter 5, givers tried to match the physical object to a memory that related to chocolate or a flavour. For example, one of the chocolates was champagne flavour and the participant selected a photograph that had a champagne bottle in it. Based on previous insights, **the idea of providing givers with more freedom to select**

a physical object was contemplated, which may uncover deeper roles of objects and their meaning within hybrid exchanges.

In addition to findings from chapter 5, extant literature debates the place of objects within exchanges. Carrier (1991) comments on how symbolising a relationship characterises a gift exchange and is what differentiates gifting from pure commodity exchange. Inalienability, the idea of possessions being linked to those who gave us them (Weiner 1992), is also discussed by Carrier (1991) and further elaborates *"The point that a gift relationship involves inalienable objects, while a commodity relationship involve alienable and impersonal objects"* (p.128). This theory is supported by Areni, Kiecker, and Palan (1998) who completed a study to analyse memorable gift experiences. Findings from the study included themes of memorable gifts. For example, personal history, helping others, surprise and value, and secrecy. Notably, one theme entitled 'symbol of the relationship' discusses the idea that when a recipient looks at the gift they will be reminded of the giver, in turn signifying the closeness of their relationship.

So far in this thesis, it remains unclear if nostalgic digital layers are preferable because of the generic gift (chocolates) they have been presented with. Whilst findings from chapter 5 show that givers took their time selecting a nostalgic memory, it is debatable if this was because they only had to concentrate on selecting a meaningful memory as opposed to a meaningful physical gift, their only option was to select chocolates. Further, previous work by Van den Hoven, Orth, and Zijlema (2021) discussed in chapter 2 outlines the connection types between memories and possessions (see Figure 6.1). The authors discuss various ways that possessions can acquire memories (through usage and ownership), or how memories can be expressed through possessions (e.g. jewellery from a grandparent can cue memories of them). In both this thesis and extant literature, it is argued that **there remains a gap in knowledge: can digital nostalgic memories connect to a physical possession selected by a gift-giver**. This alludes to grounds for further exploration of changing the chocolates to a more meaningful tailored physical gift, hand-selected

by the giver.



Visual of the four different kinds of relations between possessions and memories, C1 and C2 represent a connection between possession and memory that still exists, from an object or memory perspective respectively. C3 and C4 have lost the connection (temporarily or permanently) between possession and memory, and either the object or the memory remains.

Figure 6.1: Connections between possessions and memories(Van den Hoven, Orth, and Zijlema 2021)

Aside from changing the physical gift item, this study also enabled gift-givers to add a YouTube video in addition to an image and text. Based on chapter 4 and chapter 5, both recipients and givers suggested other media types they feel can be a nostalgic trigger for them. For example within chapter 5, 14 out of 18 participants stated music and videos are nostalgic triggers and considered how they could be integrated as part of a nostalgic digital layer. Two recipients (6b, 9b) commented on how technology should be used to its advantage and present different media types together to create a compelling gift. It is clear from the findings that the image and text combination was important to recipients and givers, who respectively enjoyed unwrapping or creating the nostalgic digital layer.

Aside from findings, literature elaborates on music as a nostalgic trigger, especially in the fields of HCI (Nilsson, Johansson, and Håkansson 2003; Cosley et al. 2009), psychology (Baumgartner 1992), and marketing (Havlena and Holak 1991). Baum-

gartner (1992) comments on how music is associated with autobiographical memories and can be a reminder of a particular experience, findings from questionnaires with 73 participants found that nostalgic recollections are associated with music. In the field of HCI, studies have found that music sharing can be underpinned with key gifting characteristics to give, receive, and reciprocate (Giesler 2006). Further studies in HCI have demonstrated how the use of music can evoke nostalgia, such as work by Nilsson, Johansson, and Håkansson (2003) on an interactive table runner that played old music excerpts when pressed. Further, Sungkajun and Seo (2019) created an interactive art installation that used a mixture of media types including music and video to tell stories, findings showed this evoked nostalgic emotions.

The findings in chapter 5 and relevant literature confirm that music can be a nostalgic trigger, yet knowledge on gifting music remains limited. Previous studies have focused on the sharing of music as a file (Giesler 2006; Zerva 2008). Therefore, for this study it is suggested that an optional text message and a required image will remain the same, however, givers can upload an additional media type (YouTube link) to explore gifting music or video as part of a hybrid gift exchange. This further contributes to discussions on how multi-sensory technologies may increase both visual and emotional appeal (Mishra et al. 2021; Mullins et al. 2022). In this case, the **digital layers can enable a combination of sound and sight**, Whilst the physical part of gifts can enable touch, smell, and taste, which may uncover the impacts of a multi-sensory gift.

To summarise, this study sets out to explore the following, *"Can physical and digital objects combine to create a nostalgic narrative? And if so, how does this happen in a hybrid gift exchange?"*. To explore this question, gift-givers have the freedom to select a physical gift product of their choice and use media to create a nostalgic digital layer. The remainder of this section sets out the study design including participants, demographics, recruitment, how gifts were created, how gifts were received, the ethical considerations are outlined, and a summary of data collection and analysis methods are set out. The chapter then discusses findings from thematic

analysis of interview data, key discussion points, and implications of the study findings. Lastly, the chapter closes with a summary of key takeaways.

6.1.1 Participants

In total, 9 pairs of participants were recruited, meaning 18 individuals took part in the study. The aim was to recruit pairs of close interpersonal relationships. Generally, pairs were recruited through social media, email, and word of mouth. Due to uptake challenges, the final 3 pairs were recruited via a local participant recruitment agency where a small fee was paid to the company to help find participants who wanted or needed to send a gift.

An aim was to recruit a range of participants with varying experiences and relationships, further, it was stated that participants should be based within the UK and have access to a smartphone. Potential recipients would be sent a screening form to check for any allergies or implications for taking part in the study, this form also captured basic demographics such as age group (see Appendix C.1 for a blank demographics form).

No compensation was offered to participants for taking part however, gift-givers were allocated a budget of £25 to spend on a gift of their choice. This deliberate decision was to ensure genuine gift exchanges between pairs were captured instead of being 'paid' to send a loved one a gift.

The ages of participants ranged from 18-58 with various professions including gymnastics coach, supply chain worker, support worker, design manager, administrator, financial planner, school business manager, and others including a few students. Four pairs of participants were cohabiting and the majority of participants were aged between 18-34 with some falling into the 35-64 age group. In total, 13 females took part and 5 males. Table 6.1 shows relationships between pairs, which were defined within the interviews by the participants themselves. Following on from chapter 5, there was no criteria to recruit only collocated or remote pairs, and a lab

study was deemed unsuitable for this type of study involving personal gifts. Thus, gift exchanges took place in homes but differing from chapter 5, more collocated exchanges took place this time. With four pairs being together in-person to discuss the gift after opening. The remaining five exchanges were remote.

Table 6.1: Overview of participant relationships tailored gifting study.

Participant IDs	Relationship	Cohabiting
1A / 1B	Partners	Yes
2A / 2B	Friends	No
3A / 3B	Friends	No
4A / 4B	Sisters	No
5A / 5B	Married couple	Yes
6A / 6B	Married couple	No
7A / 7B	Mother and Daughter	Yes
8A / 8B	Friends	No
9A / 9B	Married couple	Yes

6.1.2 Creating Gifts

After appropriate ethical consent had been acquired, gift-givers were directed to a website link via email where they would create their gifts. The website was created by the researcher and it contained a video to define key terms, present the study aims, the study process, and examples of what a finished gift may involve, the webpage can be viewed in Figure 6.2. The video displayed to participants included a definition of hybrid gifting, tailored gifts, and as per other studies that involve nostalgia evocation (Wildschut, Sedikides, et al. 2006; Routledge et al. 2012), participants were provided with the following definition of nostalgia from the Cambridge Dictionary: ***"A feeling of pleasure and sometimes slight sadness at the same time as you think about things that happened in the past"*** (Press 1995).

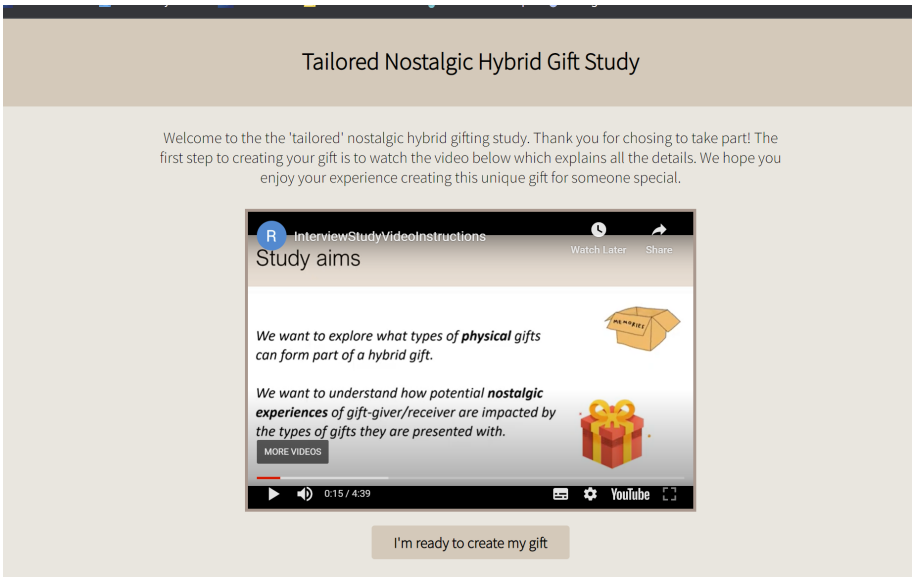


Figure 6.2: Webpage gift-givers were directed to

Once participants had watched the video in their own time they could click the 'I'm ready to create my gift' button to take them to a second page (see Figure 6.3). This page displayed three steps for creating the gift. Firstly, a list of five online retailers and links to their websites were presented for givers to search for the physical gift item(s). The retailers were chosen due to their wide product ranges and dedicated 'gifting' sections on their websites. It is acknowledged that full freedom couldn't be provided to gift-givers to shop anywhere because of purchasing restrictions on certain websites within the university. Secondly, givers were encouraged to think of a nostalgic memory and the media types they could use to represent this. Importantly, the wording of this step did not include any emotive language about memories or the past, as the aim was not to guide or lead participants too much into what they might select. Thirdly, the last step was to bring their chosen physical and digital objects together via a Google form. Examples of questions from the form can be seen in Figure 6.4.

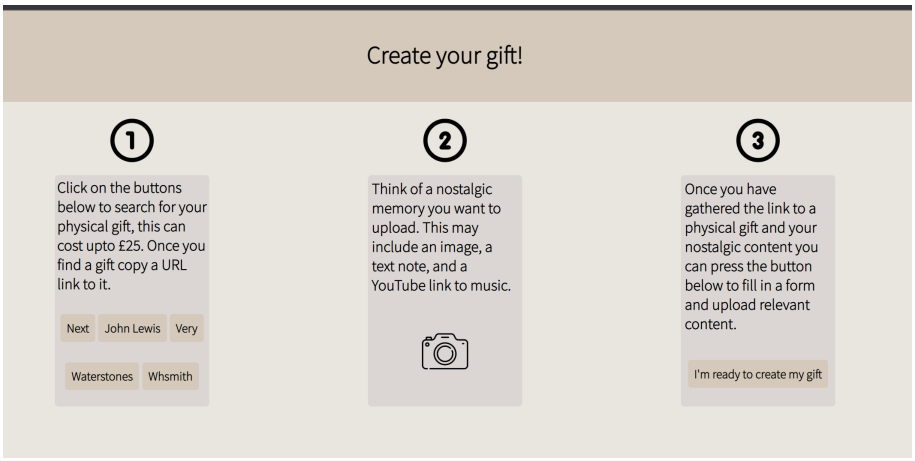


Figure 6.3: Webpage with step by step instructions to create a gift

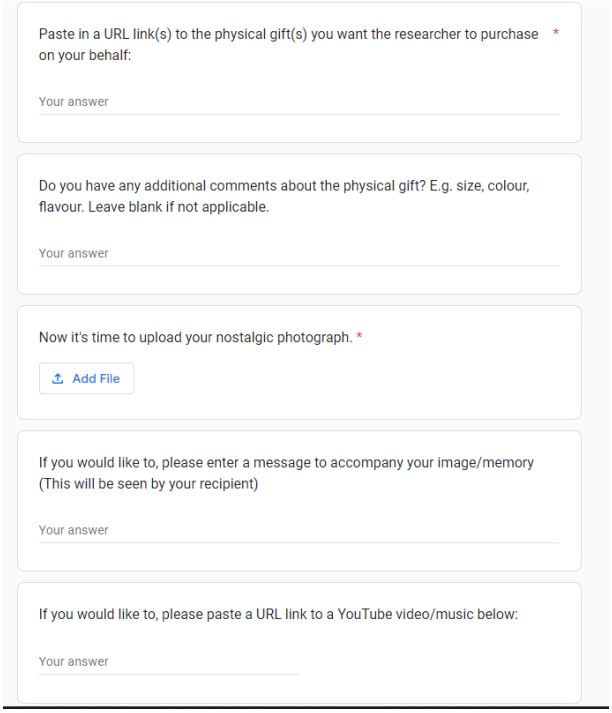


Figure 6.4: Form that captured gift information

After givers had completed their gift creation form, the researcher was then able to purchase desired physical objects and create the digital layers. The uploaded digital media corresponded to a QR code which was attached to a gift tag, as per the approach presented in chapter 5 section 5.2.2. Any physical objects were then wrapped and posted to the chosen recipient. An example of what a recipient may receive can be seen in Figure 6.5. Also within the package, a sheet of paper would

encourage recipients to reflect on their experience when opening the gift, and stated they could contact their gift-giver regarding the gift if they wished as this would not impact the study. The aim was to keep the exchange as authentic as possible within study conditions, and normally gifts are discussed after opening. Once scanned the recipient could reveal the digital layer, an example can be viewed in Figure 6.6 (no actual participant data displayed).



Figure 6.5: Example packaged gift



Figure 6.6: Example digital layer

6.1.3 Ethical Considerations

As the study involved personal data, extra care was taken to ensure safe and appropriate storage and use. Firstly, potential recipients were directed to a screening form to check for any implications of them taking part. All participants were also sent an online information sheet (see Appendix C.2) and an online informed consent form (see Appendix C.3) which outlined the use of personal data, taking part, and copyright. Care was taken to anonymise and clean automatically generated transcripts to make sure participants could not be identified.

6.1.4 Data Collection and Analysis

Interviews were conducted online via Microsoft Teams and on average lasted for 25 minutes. Interviews took a semi-structured approach and loosely followed a guide (see Appendix C.4). Gift-givers and recipients were interviewed separately to mitigate against recipients potentially only giving positive feedback in the presence

of their giver. Interview questions differed between gift-giver and recipient. For example, gift recipient questions asked questions like 'Tell me about your experience of receiving this gift?' and 'did you recall any memories when receiving this gift?'. For gift-giver, questions focused on the creation of the gift and asked questions like 'How did you find creating the gift?' and asked more general questions like 'Are there any other types of physical objects that could be paired with nostalgic digital content?'.

Automatically generated transcripts from Microsoft Teams were then cleaned and anonymised, following this the reflexive thematic analysis could begin (Braun and Clarke 2006; Braun, Virginia and Clarke, Victoria 2019). As per the approach of Braun, Virginia and Clarke, Victoria (2019), the assumptions and starting point of the researcher were identified before any coding took place. For example, the starting point included acknowledgement of my previous interactions with hybrid gifting, knowledge of gifting, nostalgia, and technologies. The assumptions I made were that most people have prior experiences of sending or receiving a gift, people have purchased a gift online before or online shopped, none of the participants would have interacted with a hybrid gift before, and participants would have experienced nostalgic emotions before. The full reflexive analysis process is outlined within chapter 3 section 3.3.

An example from the thematic analysis of this study can be viewed in Appendix C.5. Unlike chapter 5, the analysis of gift-giver and recipient interviews was completed together. The reasoning for this was to build upon the roles and knowledge distinguished within chapter 5 but also to converge experiences and understand the exchange as a whole.

6.2 Findings

This section will present the themes generated from thematic analysis. An overview of participant gifts can be viewed in Table 6.2. On average, physical gifts costed

£18.76 with the least costly gift being £12 and the most expensive being the full £25 budget. **The limiting nature of this budget is acknowledged and it was recognised that participants perhaps would have got something different had the budget been larger.** Having said that, the £25 limit perhaps promoted deeper thought from givers on what product they may select and why. Out of 9 pairs, 4 lived together and 5 out of 9 gift-givers decided to use video/music to form part of the digital layer. The thematic analysis resulted in three themes with associated sub-themes in each, an overview can be viewed in Figure 6.7. This section will outline each theme and present related sub-themes.

Table 6.2: Overview of gifts selected

Physical gift	Media	Memory
Pyjamas	Image, video, text	Family holiday to a themepark with music from that place.
Earrings with pawprint	Image, text	Image of family dog and message about when they first got the pet.
Hipflask	Image, video, text	Image of couple and music from a particularly meaningful country.
Shoes/trainers	Image, video, text	Video from a past trip, a meaningful religious verse to the couple, and a picture of the same trip.
Perfume and necklace	Image, text	Image of of childhood with their grandmother and text as a reminder of growing up in their home country with family.
Two paper maps	Image, text	Image from an expedition alongside some text as a reminder of their shared experience there.
Notebook and pen	Image, text	Image of a fond past time of children and text to symbolise the relationship.
Spa products	Image, video, text	Image of holiday place, a song they listened to on holiday, and a message regarding relaxing.
Pyjamas	Image, video, text	Image of friends together, with their favorite song, and a message about their relationship strength.

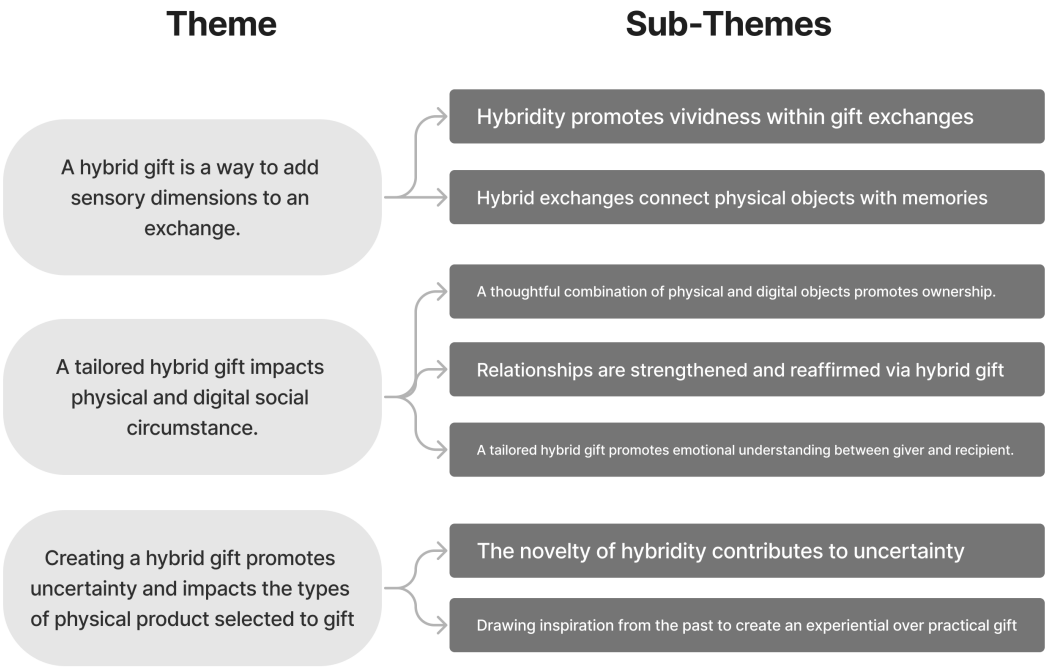


Figure 6.7: Overview of themes

6.2.1 A hybrid gift is a way to add sensory dimensions to an exchange

The justification for this theme is that the combination of physical and digital objects promoted a multi-sensory nostalgic experience. The digital layer appealed to auditory and visual senses, whilst the physical objects enabled touch and smell. Thus, hybridity was vital within exchanges to bring nostalgic memories to life via a combination of senses. An outcome of this, is the future associations between physical objects and digital memories.

Hybridity promotes vividness within gift exchanges: The use of both physical and digital objects promoted a sensorially-rich mediated environment. The exchange was vivid due to how the information (nostalgic memory) was presented and brought to life. Participant 6B adds, *"It added a whole kind of depth to the gift and then contextualized it in a way that was really really nice [...] The name of the song written down is not going to strike the same emotion as if you actually hear it"*. Participant 3B further commented, *"[...] as soon as I got it and the two maps came out,* ***that was just like the memory being opened****"*.

The combination of senses enabled givers to communicate their intended message, whilst receivers could clearly understand and interpret the meaning. Due to the visual and emotional appeal via multiple objects and senses, the hybridity promoted a vivid experience. For example, Participant 7A stated, *"if I sent the earrings alone, they would have needed an explanation [...] Without some form of explanation or either chatting it through with the recipient or sending a photo as a reminder"*. Relatedly, Participant 4B who received perfume for their gift commented, *"I associate smells with a lot of things and like they bring back a lot of memories for me [...]* ***it just brings back some memories that you didn't even probably think about*** *on a daily basis"*. Further, Participant 8A felt the multi-sensory nature of the gift brought *"a whole different level"* of personalisation to the gift.

Hybrid exchanges connect physical objects with memories: The combination of objects and the opening of them in a similar time-frame meant that in some cases, the physical object inherited the associated nostalgic memory. For example, Participant 4B believed the perfume would remind them of their grandmother in the future and added, *"If I wear it [perfume], it's gonna be a constant reminder of me being closer to my family because obviously my younger sister has gifted it to me and it's something that I associate with my grandmother now [...] maybe like* ***when I'm missing home, that's when I'll use it****, because it brings back such a rush of memories"* . Similarly, Participant 5B mentioned *"wearing that pair of shoes now would remind me of you know, with that text that he put"*. Participant 7B who was gifted earrings alongside a digital memory that focused on their pet dog stated they will associate the earrings with their gift-giver (mother) and with that memory of their dog. Although this was not always the case, for example, 2B didn't feel the association between memory and the gifted notebook and added, *"if it had been a gift that had some relevance to the boys [...] then I would have put them together"*.

6.2.2 A tailored hybrid gift impacts physical and digital social circumstance

This is a theme because, similar to traditional modalities of gifting, hybrid gifting can impact and alter social circumstance. For example feedback, conversations, asking others about gift ideas, sharing, and keeping objects. However, findings show that hybridity promoted different types of communication, feedback, keeping, and sharing. This includes sharing both physical and digital objects on social media, screenshotting the digital layer to keep the memory, recipients video recording their reaction to share the social ritual with their giver, and the digital layer being a way to guide recipients through the exchange. In brief, both physical and digital social spaces were impacted because of the hybridity of the gift.

A thoughtful combination of physical and digital objects promotes ownership: Findings demonstrated that the physical item was required to promote tangible ownership, but the emotional ownership was elicited through the digital layer. This resulted in many of the recipients (1B, 2B, 3B, 4B, 5B, 6B, 7B) discussing how they would **keep** their gift. For example, Participant 3B who was gifted maps commented, *"so I'm gonna put something up on my wall where I've got the map for the route marked on it and perhaps the skis crossed across the top with [. . .] you know [the qr code] on the bottom, because that's almost like the, you know, why is this up there?"*. Participant 7B mentioned how they were going to keep the memory, *"what's best for me if I want to keep this memory I'll screenshot this so it's always in my camera roll"*. Differently, Participant 1B discussed keeping the QR code stating, *"I think it's nice to have it to just open the QR code whenever I want to look back at the song with the picture of the holidays"*. Overall, **the combination of objects provided a strong connection to promote ownership** with Participant 6B who was gifted a hipflask summarising *"what I received was a utility. It's something you use and it could very easily go from being the gift [6A] gave me to being just the thing I use to drink out of. It takes away a lot of the embedded*

emotions within it [...] ***it definitely adds a whole layer of gifty".***

Relationships are strengthened and reaffirmed via hybrid gift: Like with any gift exchange, relationships were impacted within the hybrid exchanges, mainly in a positive way. Participant 2B felt their relationship with their gift-giver was reaffirmed and stated, *"So it just made me feel that she feels the same about me as I do her"*. Similarly, Participant 6B mentioned *"it's nice to be reminded about how well someone really knows you"*. Participant 1A discussed how creating the gift made them feel connected to their recipient (partner), *"it's caring for someone and showing it in I guess a different way, so not just words and stuff [...] it's about the other person"*.

In some cases, participants (4A, 8B) mentioned sharing the gift or exchange with others, in turn demonstrating how their relationship had been strengthened via the gift. For example, Participant 4A discussed how their recipient (sister) filmed the opening of the gift, *"she actually filmed the whole thing while opening the gift, and then she sent that to me"*. Whereas, Participant 8B shared the gift on social media *"I put it on Facebook that she got [me the gift], all my family was saying how nice it was"*. In brief, recipient experiences were augmented with the past, relationships, and a memory via the hybrid gift which in turn confirmed or strengthened relationships.

A tailored hybrid gift promotes emotional understanding between giver and recipient: When creating the gift, givers considered their own emotions but also how they wanted to make their recipient feel. Therefore, givers used both physical and digital objects to communicate and achieve the desired emotional impact. For example, Giver 4A wanted to remind their sister 4B of their childhood and memories of their grandmother stating the bittersweet feelings that come with recalling these past times, *"it was fun to remember all of those memories. It was just nice to think about all of that, but it also just made me really sad because now that all of us are grown up"*. This message was clearly transmitted via the gift, with Participant

4B commenting, *"so it was like happy for me to go back into the past and experience those same feelings all over again. But at the same time, it made me sad that I'm away from them [...] So that's why it made it, like, happy and sad at the same time"*.

In a similar sense, Participant 5A aimed to convey a message of encouragement via the gift and added, *"so I just wanted to remind her of that and encourage her of that"*. The recipient in the pair (wife) 5B was able to discern the message from the gifted objects *"[...] am I gonna go back there [country] any time soon? Probably not. So maybe a little bit of sadness as well. Umm so it is an encouragement"*. Lastly, Giver 8A discussed how they have been through a lot with the recipient (friend 8B) and added the message: *"thanks for always being my 'no matter what friend'"* to the gift. Participant 8B clearly understood the givers motivation and emotions via the hybrid gift stating similar reflections to their giver, *"We've been at the bottom and at the high we've done everything together [...]So it's kind of like a positive and a negative at the same time"*. Overall, there was a mixture of explicit or subtle messages conveyed within the exchanges.

6.2.3 Creating a hybrid gift promotes uncertainty and impacts the types of physical product selected to gift

This is a theme because, at the beginning of gift exchanges, givers usually have motivation for what they want to give and why, after the gift has been sent they anticipate their recipient opening the gift which sometimes can result in worry or anxiety. Both elements were present within exchanges in this study however, hybridity also impacted the type of products givers selected to gift and why.

The novelty of hybridity contributes to uncertainty: This gift exchange was an unknown situation for the gift-giver, and generally, they were unsure of how to behave under new gifting conditions where they were unable to draw upon prior experiences to help. For example, Participant 1A commented *"so it was fun, but*

also stressful for me. [...] The attention and the care of like, really figuring out what they would like [...] it's kind of like a puzzle" . Further, Participant 9A mentioned how the hybridity contributed to increased uncertainty and gifting anxiety, *"I felt a bit under pressure [...], you know, what am I gonna get? How am I gonna link this together and what's it gonna be like?* ***How will it be received?"*** . Similarly, Participant 7A found the same thing and commented, *"connecting it [memory] with buying something that is related to that was quite tricky [...] it took a while to think it through and think, well, what event can I think about?"*. Lastly, Participant 4A highlighted their concern regarding if their recipient would understand the intended meaning and added, *"I didn't really know if she would sort of remember it and recognize that photograph at first because I don't think we've seen it in, like, a lot of years"*.

Drawing inspiration from the past to create an experiential over practical gift: Givers leaned on a shared past or something meaningful to them at the time of creating the gift. Generally, the nostalgic memory or inspiration came first with the physical object being selected second to match the narrative. Participant 4A elaborated on their inspiration for the gift, *"I've always been very close to my grandparents, which is* ***why I chose my grandmother, as like the inspiration for the gift*** *that I sent"*. Similarly, Participant 3A revisited the past to get inspiration for their gift, *"so it was really easy. If you go back to where we met and what we met doing [...] then* ***it's easy to pick [expedition country] as the theme*** *because we skied across it"*.

Some participants (7A, 8A, 9A), reflected more on this as a thoughtful process and were motivated to select a gift their recipient would *enjoy* as opposed to a gift that they *needed*. Participant 8A added, *"It really made me think more than if I was to go into a store [...] I actually really got time to sit and think, like, what do [8B] and I do together? Like, what is the first thing that springs to mind when I think of [8B] and I? What does she love?"*. Similarly, Participant 9A stated, *"so it adds to the thoughtfulness, doesn't it? I've not run round [department store] picked up the*

pyjamas you know [...] the sad thing for her now is whatever I do for December, the 25th [Christmas] isn't gonna be quite as thoughtful".

6.3 Discussion

This study aimed to address gaps in knowledge based on previous work (chapters 4 and 5) and extant literature. This study set out to explore the following main research question, *"Can physical and digital objects combine to create a nostalgic narrative? And if so, how does this happen in a hybrid gift exchange?".*

The findings uncovered a range of example products that gift-givers selected, which highlighted implications of this choice on nostalgic emotions experienced by both giver and recipient. The study uncovered if nostalgic narratives can translate via hybrid modality but also **how** objects connect and **why**. This discussion aims to outline exactly what happened in participant experiences to show the connections that are possible between objects, people, and emotions in hybrid exchanges. This section will lean on the works of Kwon et al. (2017) and Van den Hoven, Orth, and Zijlema (2021) to outline the three prominent areas of tailored nostalgic hybrid gift exchanges. As outlined by Kwon et al. (2017), there are five different stages involved within a gift exchange:

1. Preparation
2. Exchange
3. Reveal
4. Use
5. Reflection

Whilst all five stages undoubtedly are part of hybrid exchanges, in the case of this study, three stages were more prominent than others in helping to address the research question: Preparation, Reveal, and Reflection. This discussion will cover

these three stages in detail to highlight the nuances and considerations of connecting physical and digital within tailored hybrid gift exchanges.

6.3.1 Preparation

As discussed by Kwon et al. (ibid.), Preparation happens at the beginning of the exchange and is usually giver dominant. Givers spend time within this stage searching, buying, and wrapping. However, the hybrid form the gifts took in this study brought new challenges and tasks for gift-givers.

Reflection and uncertainty: A common theme for gift-givers weaving throughout the Preparation stage was the sway between reflections on the past and gifting anxiety. Gift-giving can often result in anxiety or worries, especially those exchanges which are deemed novel (Wooten 2000). As this exchange involved searching for both physical and digital objects, givers found themselves in unfamiliar gifting territory, thus the task of finding a *tailored* physical gift and pairing it with a digital nostalgic memory resulted in worries about how their recipient would react to the intended meaning of the gift.

During the Preparation stage, the nostalgic memory or inspiration usually came first with the physical object being selected second to match the narrative. This meant gift-givers reflected on relationships, their lived experiences, places, and objects as part of the Preparation stage. Wolfinbarger and Yale (1993) and Williams and Rosenzweig (2017) outlined how gifts can fall into two categories: utilitarian, which is something practical in which their gift-recipient may *need*; and hedonistic which is a gift that is not required but may be *enjoyed*. Findings from this study demonstrate that **reflections subsequently led to a more hedonistic exchange as opposed to utilitarian, most givers were guided by their nostalgic reflections instead of gifts their recipient had asked for or needed.**

As mentioned above, often givers would sway between reflection and worry, as they were unsure how their recipient would feel about the memory, the selected physical

object, or the theme for the gift. Hybrid modalities differ from traditional paths of preparing a gift because there are multiple parts to bring together to tell a coherent thoughtful narrative.

Inheritance: A key part of the study involved the gift-giver *tailoring* the gift for the recipient, which is defined as *matching gifts to distinguishable characteristics of the giver or receiver* (Schwartz 1967; Galak, Givi, and Williams 2016). Notably, when gift-givers were asked to create a *tailored* gift for their recipient using physical and digital objects, they opted to **match them to tell a story as opposed to tailoring objects to their recipient's taste or interest**. In brief, this was a **giver-centric exchange** (Aknin and Human 2015). The gifts mainly reflected the gift-giver as opposed to the recipient, therefore physical objects were able to inherit a sense of the giver. Based on this, the definition of a tailored hybrid gift was able to evolve as ***'matching physical and digital objects in a giver-centric manner to represent a nostalgic narrative'.***

To elaborate further, connection types between possessions and memories were reflected on by revisiting the work of Van den Hoven, Orth, and Zijlema (2021) see Figure 6.1 in section 6.1. The authors discuss in connection type C1 how through ownership, usage, access, and acquisition, physical objects can inherit autobiographical memories and further state, *"connections can be established by the possession's proximity, involvement or likeness to the memory it can bring to mind" (p95).* Although the authors highlight within connection type C1 how digital possessions lack tangible patinas to associate with the past, they do provide opportunities to share memories and can be a high-fidelity memory cue. To build on the work of Van den Hoven, Orth, and Zijlema (ibid.) and reflect on this study, it was discovered that at the Preparation stage of gifting, givers' actions are how physical possessions and digital memories connect as opposed to ownership or use, **it's the giver that ensures a physical object inherits the digital memory.**

As an example, giver 4A's journey can be viewed in Figure 6.8. They spent time

reflecting on memories, and intentionally selected a *theme* and *inspiration* for the gift, their grandmother. This was an iterative process comprising some elements of doubt and anxiety around how the recipient (sister) would perceive the narrative and gift. The outcome of this Preparation stage was the giver attaching digital memories of their grandmother to physical items (perfume and a necklace) to tell a story of home and childhood.

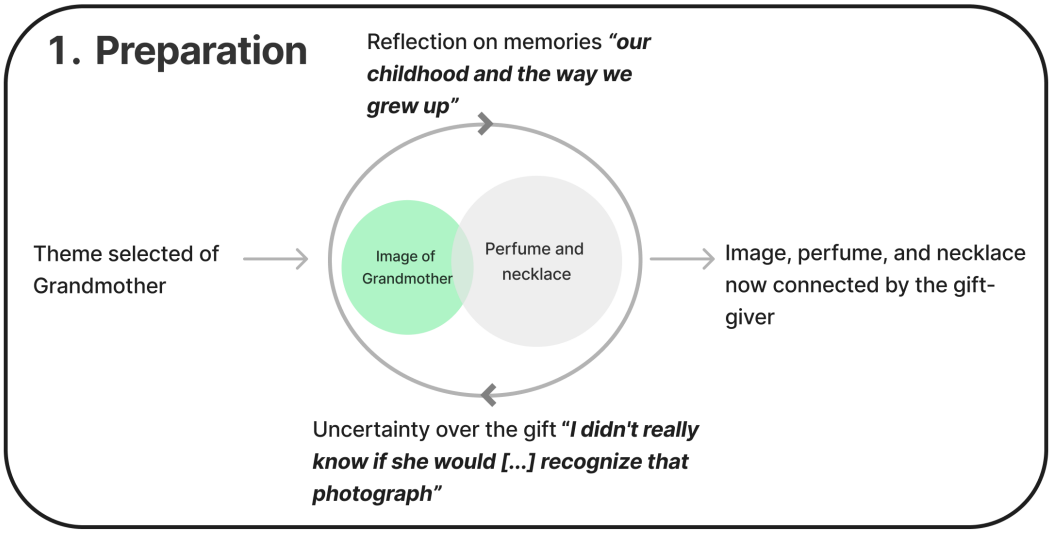


Figure 6.8: Participant 4A Preparation Stage

6.3.2 Reveal

An essential part of the exchange is Reveal and Kwon et al. (2017) outline that this stage involves feelings of excitement, suspense, and anticipation when the gift is unwrapped. The previous section of Preparation demonstrated how the gift-giver links physical products to nostalgic digital media, but **it did not address what happens at the Reveal stage for the recipient to make their connections between the physical and digital objects**, this section will set out how this happens.

Nostalgic emotional appeal: Desired emotional impacts can be difficult to translate via gifted items due to differences in gift-giver and recipients' abilities to understand emotions (Pillai and Krishnakumar 2019). On one hand, gift-givers were influenced by their reflections and emotions and on the other hand, they thought

deeply about their recipient and how they would react to the gift. To reflect on this, nostalgic literature was revisited. A prominent characteristic of nostalgic emotions is the way they can influence and imbue meaning onto lives, objects, and people (Routledge et al. 2012). This contributed to recipients connecting physical and digital because of the emotional meaning behind the nostalgic theme presented.

Multi-sensory presentation: Technologies can promote sensorially-rich mediated environments that can result in *vividness* (Steuer, Biocca, and M. R. Levy 1995). In this study, nostalgic memories were presented in a multi-sensory (touch, visual, auditory, and olfactory) way which promoted vividness and enabled recipients to make the association between digital and physical objects. These multi-sensory technologies can afford increased visual and emotional appeal (Mishra et al. 2021), and when a combination of senses are targeted they can be used to facilitate rich reminiscence activities (Mullins et al. 2022). In this case, vividness and the appeal to multiple senses enabled recipients to **connect the physical product with their nostalgic memories, resulting in ongoing connections between physical and digital.**

To reflect on the design decision of embedding a YouTube video, some participants only used this as means for delivering a song with the visual element being unimportant. Therefore, future designs could explore other ways to embed music only or voice without the need for a video. Having said that, the concept relates to the slow technology philosophy of design where more personal videos could elongate the reveal stage and invite reflection (Hallnäs and Redström 2001).

Revisiting work by Van den Hoven, Orth, and Zijlema (2021) on connection types between memories and possessions (see Figure 6.1), it's unclear from the model how connections may transform or evolve from type C1 to C2. This Reveal stage has demonstrated, how in the case of tailored nostalgic hybrid gift exchanges, the emotional appeal, nostalgic emotions, a combination of senses, and vividness all enable connections to practically materialise. **Reveal shows the 'in-between'**

stage of what happens at the point of opening the gift for recipients to make those connections for themselves.

To demonstrate this stage, Figure 6.9 shows Participant 4B's experience of opening the gift. The recipient opens both physical and digital objects, they connect due to the multi-sensory presentation of information and the emotional appeal which promotes a vivid experience. In this case, the perfume, necklace, image, and text all contribute to the recipient forming connections between objects.

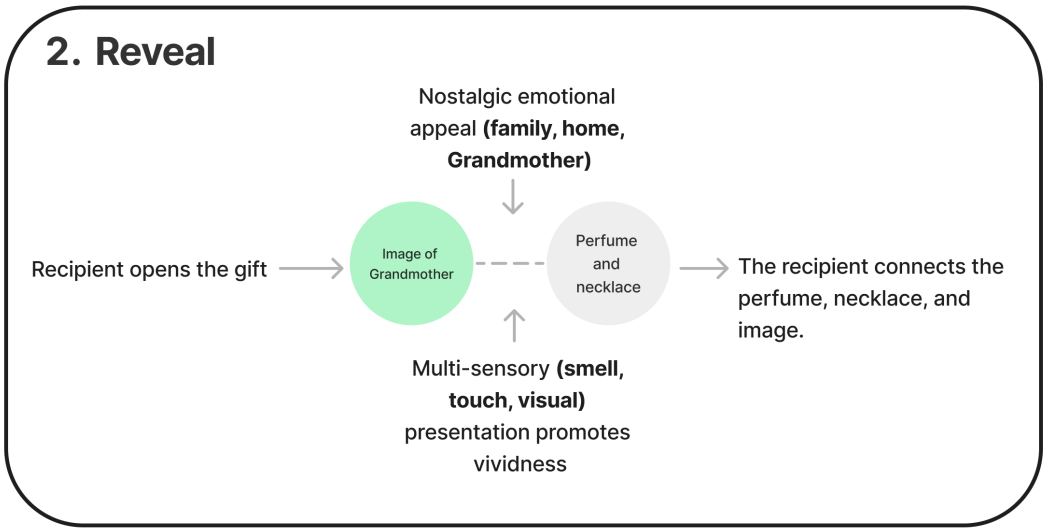


Figure 6.9: Participant 4B Reveal Stage

A final point related to the reveal part is the nature of the exchange being either collocated or remote. This study found that collocated exchanges meant that the giver could be there to instruct their recipient. For example, Participant 5A was able to instruct their recipient to scan the QR code. Whereas in collocated pair 7A/7B, the recipient 7B was able to give feedback and thanks straight away after opening the gift, demonstrating their appreciation by showing other family members also present at the time of opening. For the remote exchanges, participant 4B decided to record them opening the gift to retrospectively send to their gift-giver to asynchronously share that moment with them. Participant 8B decided to share a post on Facebook to demonstrate their gratitude, which perhaps may not have happened if the pair had been collocated at the time of opening, thus they made a social media gesture. Ultimately, it's important to acknowledge that the type of exchange can alter the

reveal and feedback of a gift.

6.3.3 Reflection

The final part of an exchange is Reflection, with Kwon et al. (2017) acknowledging that this stage involves making sense of personal experiences and notes how this can strengthen relationships through feedback and communication. The previous stages of Preparation and Reveal outlined how the giver connects objects initially and then how the recipient interprets and understands the objects, but what happens going forward after the exchange has taken place? This section will outline the role of Reflection in tailored nostalgic hybrid gift exchanges.

Keeping: Ownership is a key part of exchanges which can relate to keeping or using a physical object (Belk, Russell W 1988). Similarly, participants noted they would keep the physical gifted item, with some opting to screenshot the digital content, display the gift tag with the QR code, or share the memory with others in person, over a message, or on social media (similar to findings in chapter 5). These intentional acts can contribute to reflection with others. Overall, the hybrid nature of the gift provided a strong connection to promote ownership, a desire to keep the objects, and a trigger to reflect on objects in the future.

Inalienability and reflective cues: As mentioned by Kwon et al. (2017) the Reflection stage can impact upon relationships. Other scholars in this space have outlined ways in which gifts can alter relationships including, strengthen, affirm, attenuate, and sever (Sherry 1983). The tailored hybrid model in this study predominately strengthened or affirmed relationships via givers signalling relationship meaning through personal memories. Within the Reflection stage, **the physical object is now transformed into a cue for the digital memory**, which could be deemed a different type of inalienability (when physical items can inherit a sense of the person who gave it (Weiner 1992; Spence, Bedwell, et al. 2019)).

To interrogate this concept further, connection type C2 from Figure 6.1 in section

6.1 is reflected upon. The authors state that possessions in this category are kept for remembering purposes such as a souvenir from a holiday. Based on this work, tailored hybrid nostalgic gifts have three clear reflective cues for recipients:

1. The giver and relationships.
2. The gift exchange.
3. The digital memory/media.

This demonstrates how objects and their connections have been transformed via the exchange and now could fit within connection type C2 *"memories are expressed through possessions"* (Van den Hoven, Orth, and Zijlema 2021). The participants from the study noted how going forward when they use, display, or view the physical object they will think of one of the above. Therefore, providing a sense of inalienability during the Reflection stage and beyond, but also **how the physical gifted objects become a cue for the presented digital memory from the giver back at the Preparation stage.**

Participant 4B's Reflection stage can be viewed in Figure 6.10. The diagram shows how the necklace and perfume become a cue for nostalgic reminiscence of family and home, and how going forward the physical objects will also remind them of their sister and the inspiration for the gift, their grandmother.

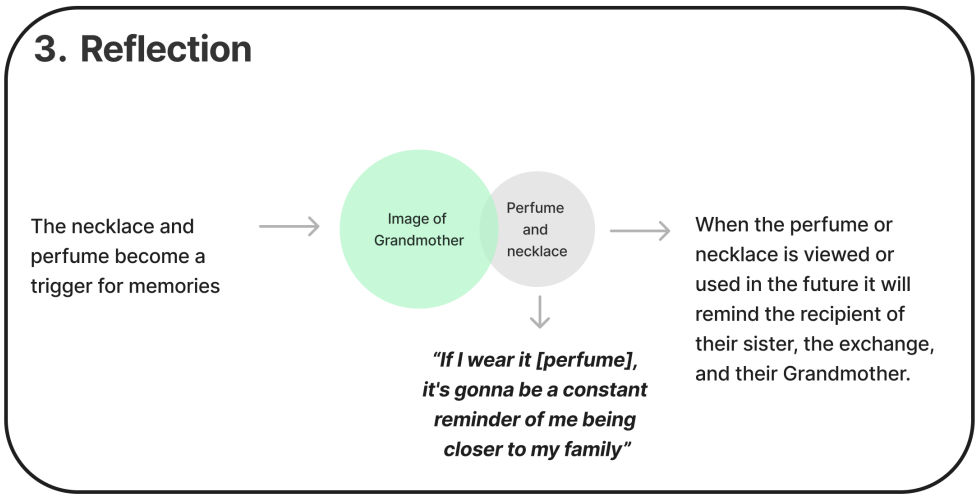


Figure 6.10: Participant 4B Reflection Stage

6.3.4 An Overview of Connecting the Objects in Hybrid Gift Exchanges

So far, this discussion has outlined the Preparation, Reveal, and Reflection stages involved in tailored hybrid gift exchanges. The first stage of Preparation illustrates how the physical product acquires digital memories because the gift-giver spends time reflecting and intentionally selects a *theme* or *inspiration* for the gift. The second stage of Reveal is the part when the recipient opens the gift. In a hybrid exchange recipients have to unwrap both physical and digital objects, this is when they link objects **because of the multi-sensory presentation of nostalgic memories**. The final stage of Reflection is when physical possessions become a cue for memories, which can be a reminder of the digital media/memory when the physical possession is used or viewed in the future.

To explicitly set out how gifted physical possessions and nostalgic digital memories are connected within hybrid gift exchanges, Figure 6.11 outlines the Preparation, Reveal, and Reflection stages (based on the five-stage gift exchange model (Kwon et al. 2017)) and also presents adapted connection types C1 and C2 from the work of Van den Hoven, Orth, and Zijlema (2021) (see Figure 6.1).

Figure 6.11 builds upon the roles of hybridity established within chapter 5 and the findings from this study. The diagram contributes to new knowledge on the emotional impacts, roles, and ongoing uses of physical and digital objects within hybrid gift exchanges. In the future, the findings from this study could be used by researchers interested in exploring gifting, the presented diagram could be a way to target specific stages in an exchange. Or, **the implications could be used commercially to discuss with gift producers the place of physical products within hybrid exchanges**. Further, more generally the findings could be used in the technology-mediated reflection space to explore how nostalgic emotions are conveyed from person to person via technologies.

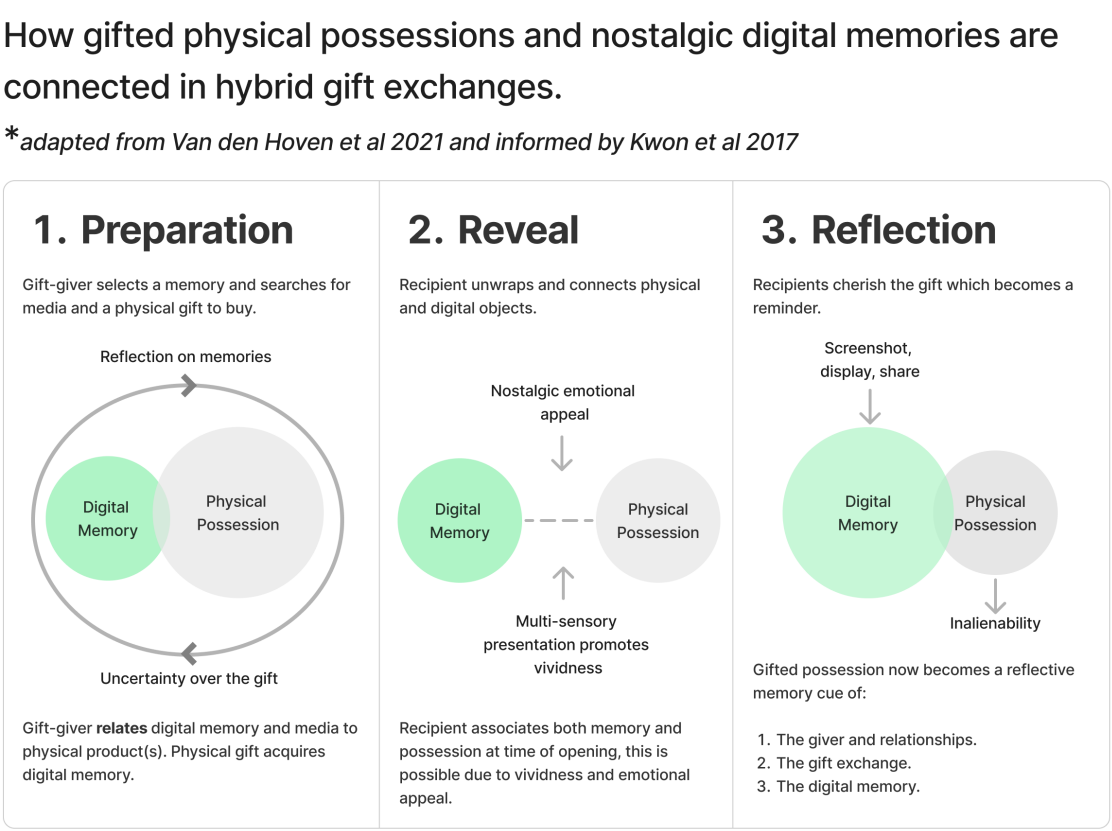


Figure 6.11: Connections between objects in tailored gift exchanges

6.4 Chapter Summary

This study aimed to address gaps in knowledge based on previous chapters (4, 5) and set out to explore the following research question, *"Can physical and digital objects combine to create a nostalgic narrative? And if so, how does this happen in a hybrid gift exchange?"*

Through gift exchanges and interviews, the experiences of 9 pairs of participants were captured and results were presented through reflexive thematic analysis. Three themes and associated sub-themes were presented, which related to sensory dimensions, social circumstance, and uncertainty. The discussion turned to the five-stage gift exchange model by Kwon et al. (2017) to map out exactly how connections between physical and digital objects form throughout the gifting process. Thus, the discussion sets out three relevant stages of the five-stage gift exchange model: Preparation, Reveal, and Reflection and adapts the connection types of C1 and C2 (see Figure 6.1 in section 6.1) by Van den Hoven, Orth, and Zijlema (2021). The

main takeaways and implications from the discussion are as follows:

1. Within the Preparation stage, givers reflect on memories to select a theme for the gift; it is an iterative process with elements of doubt and anxiety. **This is the part of the exchange where givers connect their nostalgic memory to a physical product.**

2. During the Reveal stage is when recipients can connect physical and digital objects because of the multi-sensory format that nostalgic memories are presented.

3. The final stage Reflection is when the physical possession become a high-fidelity ongoing memory cue for the digital memory, the exchange, or relationships.

This chapter has demonstrated that a range of physical products can be integrated with nostalgic digital layers to form a hybrid gift. The physical gift can be utilitarian or hedonistic, but **it is the digital memory and emotion that may transform a product into a gift**. The giver has to have a memory, theme, or inspiration that can be linked to a product which can then form a multi-sensory and vivid hybrid gift.

So far, this thesis has addressed the following:

1. The concept of transforming memories into a digital gift from gift-giver perspectives (MeMa chapter 4).

2. The roles involved in a nostalgic hybrid gift exchanges (Nostalgic Gifting Study 5).

3. This study (tailored gifting) has contributed an understanding of how and why objects can connect to create a nostalgic hybrid gift, highlighting the range of products that can be used.

Based on in-depth gift-giver and recipient experiences, there is no doubt that hybrid gifting is a socially complex and interesting area. Yet, there remains a gap in

addressing the concept from another perspective: the gift producer. It's unclear how the knowledge presented in this thesis may translate commercially to gift producers or to those within the gifting industry. The forthcoming chapter aims to distil some of the key findings to producers to gain their unique perspective on this topic.

Chapter 7

The Gift Producer Study

So far, this thesis has uncovered new knowledge on transforming digital memories into a hybrid gift and has highlighted the specific roles involved within nostalgic hybrid gift exchanges. Yet, the role of those who create gifting products or work within the gifting industry remains notably absent.

This chapter aims to address gaps by leveraging findings from previous chapters (4, 5, 6) to open a discussion with gift producers via focus group on the topic of nostalgic hybrid gifts. The first aim is to distil previous findings to gift producers to promote conversation on this topic. The second aim is to capture their viewpoints on potential barriers and opportunities they see within this space.

The chapter is formed of three main sections. The first outlines the approach and objectives including the motivation, participants, focus group design, ethical considerations, and analysis method. The second section presents themes and sub-themes from thematic analysis as well as the 'top 5' challenges and opportunities that producers agreed upon in the focus group. The third section is a discussion that outlines design considerations and the role of the gift producer in hybrid gift exchanges. The chapter then closes with a summary to outline the main takeaways of this study.

7.1 Approach and Objectives

This study aimed to capture opinions, views, and conversations between gift producers who are interested in hybrid products and personalisation using emotions like nostalgia. This work took a qualitative approach and used methods of focus group, ideation, and nominal group technique. In total, three gift producers who had their own businesses took part in the study. The method is outlined in detail within section 7.1.3.

Guided by previous work (chapters 4, 5, 6), the following research question was developed: *What are gift producer opinions on the potential challenges and opportunities of creating hybrid gift products?* The following section details the motivation and underpinning for the study in more detail and outlines how this feeds into the research question above.

7.1.1 Motivation and Background

Prior work in earlier stages of the PhD found that nostalgic memories can be attached to a range of products including common gifts like chocolate, to a more tailored gift like perfume which can present nostalgic memories in a multi-sensory and vivid format (e.g., perfume a grandmother uses and having an image of the grandmother). The roles of physical products, people, and emotions within hybrid gift exchanges have expanded throughout this thesis, yet the perspective of the gift producer remains notably absent. Motivated by this gap, this chapter engages with producers to obtain their perspectives.

A gift producer can be complex to define due to gifts being subjective and predominately determined by the person who is sending or receiving it (Befu 1977) and not by the manufacturer. On the other hand, some producers may market their products with the intent they can be gifted. A common example is small artisan or craft businesses that produce hand-made gifts, which are a popular choice for gift-givers who want to convey emotion and love via physical objects (Fuchs, Schreier,

and Van Osselaer 2015; Marotta and Heying 2018). Many of these small medium enterprises (SMEs) are run independently and often rely on a sole person to make most decisions (Gilmore, Carson, and Grant 2001). For this study, a 'gift producer' is defined as: **a SME that markets products (hand-made or otherwise) that could be gifted.**

Few works have engaged with gift producers within academic research. Extant literature has focused on engaging a range of producers. For example, semi-structured interviews with Etsy sellers (Razaq, Kolko, and Hsieh 2022), an exploration of using focus groups to engage with SMEs (R. Blackburn and Stokes 2000), and the impact of online communities for craft beer manufacturers via interviews (Foster et al. 2017). One academic work by Spence, Koleva, et al. (2023) engaged a local chocolate company to create a hybrid gift product. Findings from the study highlight both considerations and tensions of designing hybrid gift products. For example, how producers manage the *"privacy of personally sensitive messages that might be attached to a hybrid gift"* (p.31). Although existing studies provide examples of how to approach, recruit, and engage with producers and businesses, there remains a gap in engaging specifically with gift producers as a group to promote conversation and ideas on new gifting modalities.

A key aim of this study was to understand how producers envisaged transforming products into hybrid gifts with extant work highlighting the emotional and social motivations for consumers to personalise physical products (Blom 2000; Mugge, Schoormans, and Schifferstein 2009) and Mugge, Ruth and Schoormans, Jan PL and Schifferstein, Hendrik NJ (2009) note the co-creation between consumer and producer of personalised products. Despite the interest of product personalisation in fields of HCI and consumer research (Koleva et al. 2020; Kwon et al. 2017; Spence, Koleva, et al. 2023; Mugge, Ruth and Schoormans, Jan PL and Schifferstein, Hendrik NJ 2009; Blom 2000), it's unclear what gift producers think of using both physical and digital objects to create nostalgic gifts.

Motivated by this gap, this chapter aims to contribute to both consumer research and HCI fields by engaging SMEs in discussions around technology, gifting, processes, barriers, opportunities, and nostalgic emotions. Thus, resulting in **a unique opportunity to directly distil academic findings to relevant enterprises whilst simultaneously capturing gift-producer inputs**. The following sections will elaborate on the participants who took part in the study, the design of the focus group, ethical considerations, and data collection/analysis methods.

7.1.2 Participants

For this study, gift producers were recruited via social media and word of mouth. The aim was to recruit producers who were interested in adding digital content to their physical gifting products. In total, 3 producers were recruited to take part in an in-person focus group at the University which lasted for 90 minutes. Each participant was compensated with a £20 Amazon voucher for taking part in the study.

Gift producers are a specialised group and there were difficulties in recruitment. Originally 5 producers were recruited but 2 were unable to make the focus group on the day. However, each of the 3 producers that took part in the study had their own businesses and products to discuss within the focus group which enabled saturation of discussion topics. An overview of the producers can be viewed in Table 7.1. Producers were aged between 37-55 and collectively had 34 years of experience within the gifting industry. Generally, they were all confident using and interacting with technology requiring little or no help with tasks, all demographics were captured via a Microsoft form after ethical consent had been acquired but before taking part in the focus group (see Appendix D.1).

Table 7.1: Overview of gift producers

Producer ID	Gifts/Products
Participant 1	Personalised ceramic gifts
Participant 2	Jewellery, home and garden items, and digital items
Participant 3	Crafting and jewellery items

7.1.3 Focus Group Design

Focus groups are an established method to facilitate discussion in group settings (Gibbs 1997; Kamberelis and Dimitriadis 2013), and in this case, the study aimed to capture viewpoints of gift producers as a group. As set out in section 3.4.4, the focus group included nominal group and ideation techniques. This section will outline the focus group design in detail which was split into three main parts: introduction, distilling findings, and nominal group activity, see Appendix D.2 for the focus group guide and timings. To clarify, the examples used within the focus group did center on nostalgia and it was a topic of discussion with producers but this also led to more general debates and ideation around the concept of hybrid gifts with other framing aside from nostalgia. Further, it is acknowledged that producers may not be able to comment on gift-giver and recipient nostalgia which may have guided their discussions away from nostalgia to more general thoughts about hybrid gifting.

Introduction: The opening parts of a focus group should outline a reminder of ethical procedures and define key terms (Lazar, Feng, and Hochheiser 2017), whilst also making the participants feel comfortable in the environment (Krueger 2014). For this study, the focus group opened with a reminder of the ethical processes and study aims. Following this, key definitions of nostalgia, technologies, media, and hybrid gifting were presented to the producers. It was recognised that the concept of hybrid gifting may be unfamiliar to participants, therefore Figure 7.1 was used to bring the concept and definitions to life. Within the introduction, participants were also given the opportunity to ask any questions and were provided with an outline

for the remainder of the focus group.

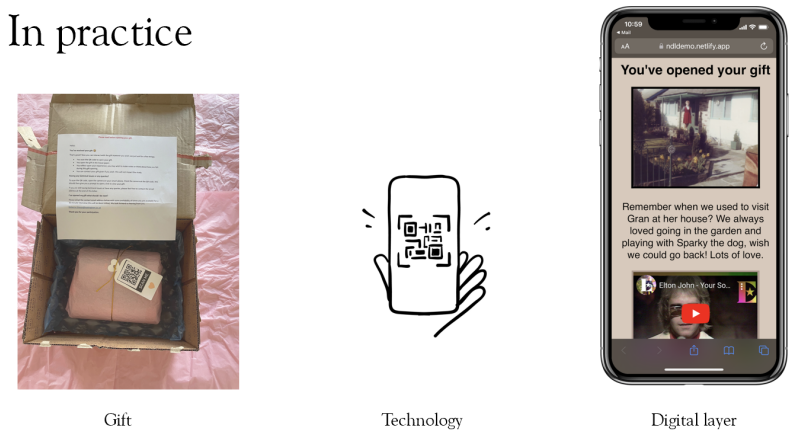


Figure 7.1: Focus group example of the hybrid gifting concept

Distilling findings: The second part of the focus group aimed to present a summary of previous findings from chapters 5 and 6. To do this, producers were presented with two hybrid gifts loosely based on prior participant experiences. They were able to open the gifts (chocolates and maps) and scan QR codes to view example nostalgic digital layers that were created by the researcher. One benefit of a focus group format is how interactive tasks can be embedded to promote ideas and discussion (Wibeck, Dahlgren, and Öberg 2007). A common participatory method used within HCI is ideation, which can include the use of sketching and drawing to create paper prototypes to communicate ideas (Sturdee and J. Lindley 2019). Therefore, after opening and interacting with the example hybrid gifts, producers were asked to think about the following: *'what might a hybrid gift product look like?'*. Participants could use provided materials (see Figure 7.2) to articulate their thoughts on what might be included in digital layers or how they may be framed to their consumers. Resources included typical gifting items such as wrapping paper and gift tags, participants were also provided with example QR codes and RFID tags, paper, and device wireframes. This was not a prescriptive activity and participants could decide themselves how and if they used the resources.



Figure 7.2: Materials provided to participants in the focus group

Nominal group activity: The third and final part of the focus group was concerned with capturing potential opportunities and challenges of the hybrid gifting modality from a gift producer perspective. One method to achieve this was previously mentioned in 3.2.2, Nominal Group Technique (NGT). NGT can elicit priorities of a group by asking each participant to individually write down opinions or answers to a question, ideas can then be shared amongst the group. Following this, similar ideas are grouped and each idea is ranked within a 'top 5' (McMillan et al. 2014; Hugé and Mukherjee 2018). NGT is not a common method used with HCI but was **a unique way to bring together topics from the focus group and also clarify points with producers**. Moreover, the original NGT method was adapted slightly for use within this study. The variation is set out below and aimed to take a more open discussion format in the following steps:

1. Introduction to the task
2. Group discussion and debate
3. Researcher asks clarifying questions
4. Top 5 are written down by the researcher with agreement from all present

After the NGT activity, the focus group was brought to a close and producers were given a final opportunity to ask any questions related to the study. Following this,

Amazon vouchers were emailed to each producer.

7.1.4 Ethical Considerations

Full ethical consent from the Computer Science Ethics Committee was gained and prior to the focus group taking place, participants were provided with an information sheet and consent form (see Appendix D.3). At the beginning of the focus group, producers were reminded of their right to withdraw at any time without giving a reason. Given that the focus group aimed to capture ideas and discourse on a new modality of gifting, producers were reminded of the following at the beginning of the focus group: *'it is agreed that any concepts shared are thereby "public" and may be reported in papers and exploited by anyone present'.*

As the focus group discussed nostalgia and memories it was recognised that for some nostalgia can evoke sad emotions and cause upset or feelings of loneliness. To address this, participants were provided with a break in the middle and if any visible signs of upset were shown there was a room booked next to the focus group if they felt they needed space.

Lastly, any images taken within the focus group did not capture participants' faces to protect their privacy. Transcripts were cleaned and anonymised, with only a broad description of participants' products being used.

7.1.5 Data Collection and Analysis

Data was collected during the focus group via both Microsoft Teams (audio only) and a Dictaphone. The MP3 file was then transcribed using the University's approved automated transcription service. The transcript was then manually cleaned and anonymised.

The analysis approach followed the Braun and Clarke (2006) phases for thematic analysis as outlined in chapter 2 section 3.3. The analysis was inductive and shaped by the research questions, however relevant literature was visited to help with the

naming and defining of themes phase. The thematic analysis was self-reflexive (Braun, Virginia and Clarke, Victoria 2019) and my starting point was acknowledged before undertaking any initial data coding. As per the approach of Braun and Clarke (2006), other researchers on the project were brought in to assist in the latter stages of the analysis to help with defining themes.

7.2 Findings

This section outlines generated themes from the thematic analysis and findings from the NGT. Firstly, themes are divided into two areas and relevant sub-themes are presented within each, an overview can be seen in Figure 7.3. Secondly, the NGT findings are set out into categories of challenges and opportunities that gift producers envisage with the hybrid gifting modality.

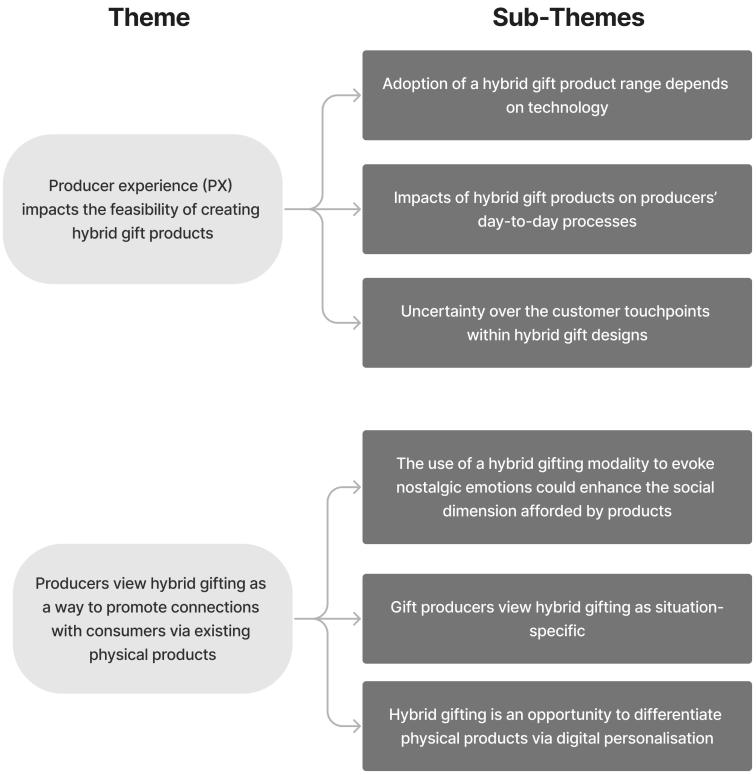
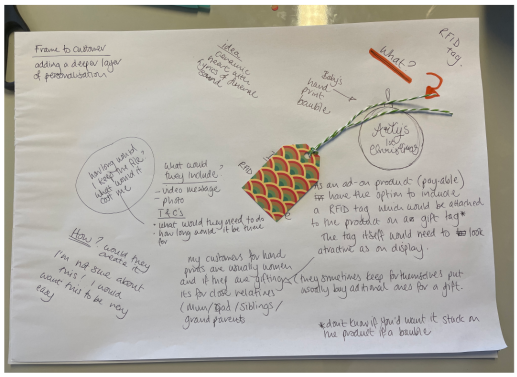
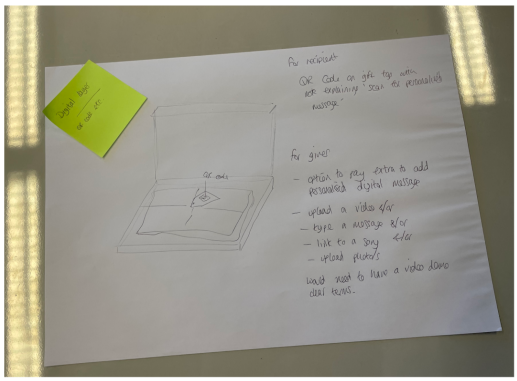


Figure 7.3: Overview of themes and sub-themes

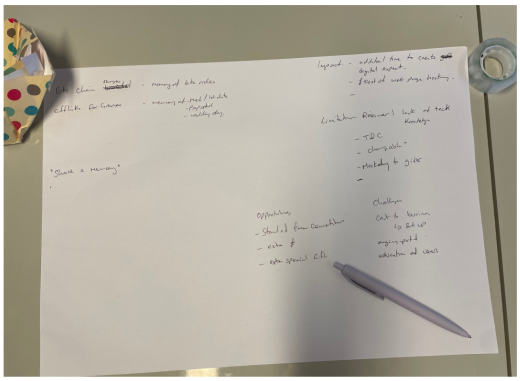
In addition to the themes and the NGT activity, sketches from the ideation activity can be viewed in Figure 7.4. As seen in the sketch from P1, they decided to think about how a digital layer could be added to their existing Christmas tree bauble product. Specifically, they considered the framing of digital layers to their customers as a way to deeply personalise the bauble and contemplated how an RFID tag could be added inside of the bauble to hide the digital part. Similarly, P2 considered how they would add a digital layer to their existing jewellery bead box product and decided to draw a gift tag with a QR code attached to the box. Moreover, P2 also listed considerations of both the giver and recipient including the requirement for clear instructions for the recipient and a video demo for gift-givers. Lastly, P3 contemplated how they could transform existing physical products into hybrid versions with digital content. For example, cuff links could be linked to digital memories of a special occasion like a wedding, or bike chain jewellery could be linked with memories from bike rides. The remainder of this chapter will outline themes generated from the focus group and the outcomes of the NGT activity.



P1



P2



P3

Figure 7.4: Sketches by producers in the focus group

7.2.1 Producer experience (PX) impacts the feasibility of creating hybrid gift products

Gift producer's current and future experiences impact the feasibility or likelihood of them creating a hybrid gift product to sell. To clarify, in this case, producer experience (PX) means their technical capabilities, experiences with digital goods, current

day-to-day processes/ways of working, resources available, and their experience in designing products. Based on the focus group, it was evident that gift producers have varying experiences, products, and resources. Each business has its own financial, practical, and technical challenges with two out of three businesses in the focus group being sole traders, they have no additional staff, whereas the other business did employ staff but mentioned this brings challenges of training staff members. To expand on this, the theme is divided into three sub-themes.

Adoption of a hybrid gift product-range depends on technology: Producers mentioned that their technical skills and experiences could stop them from creating a hybrid gift product, with P1 elaborating, *"[. . .] personally, from me, a real technical side, like, you know, how the heck would I go about that? And* ***I really wouldn't have clue where to start****. So that would be a massive hurdle".*

Moreover, producers noted more practical considerations of where media could be stored and for how long with P3 discussing, *"The page and where the QR code links to, someone has got to physically create that and then someones got to pay for that [. . .] so you might want to time limit it so it's only up there for 12 months or depending on what you're paying".* On the other hand, P2 mentioned the technical possibilities of automating digital layer creation to mitigate against potential technical uncertainty, *"So that they [consumer] upload something, then it almost creates that web page for you so you almost* ***automate that process****".*

Impacts of hybrid gift products on producers' current day-to-day processes: Throughout the focus groups, all three producers discussed their current ways of working and processes. For example, producers viewed hybrid gifting as a way to add personalised digital layers to their physical products and highlighted how this differs from their current methods of personalisation. For example, P3 mentioned, *"[the] closest thing we do to anything being personalised is if we sell something through our website or through Etsy and people ask for a gift message to be included, we will include a handwritten gift message to go in there".* Despite

the potential benefits of personalisation via hybrid gifts, P2 discussed the potential drawbacks of current processes, *"particularly setup cost because the ongoing costs I think would be covered in whatever extra people were paying. But yes,* ***that set up cost and the doing the little video demo, the changing the way your website works, the finding ways for people to upload stuff*** *and having pages and the generation of the QR code"*. Moreover, P1 mentioned that even if they were to introduce hybrid gifts they would be unsure how well products would sell and added, *"how do I know that this is what my customers would want?"*.

Overall, in the focus group there was a sense that hybrid gifts could disrupt current ways of working, however, could add value in terms of personalisation. Having said that, P2 highlighted a broader implication of educating consumers and stated, *"I think* ***the biggest issue is gonna be it's a new****, it's a new thing. So it's getting that engagement from the general public, but they need to understand what it is. So it almost needs sort of the big boys [larger organisations] to do it and to trial and test it out and find the vulnerabilities in it [...] then us smaller people would actually yeah, we want to do it, but* ***maybe now is not quite the right time until it's become almost sort of part of what people are doing***" .

Uncertainty over the customer touchpoints within hybrid gift designs: Producers contemplated the design of the customer experience when interacting with hybrid gifts. Producers mentioned aspects of onboarding, framing of gifts (with nostalgia or otherwise), wrapping the gift, instructions for creating and consuming a hybrid gift, the editing of digital content, and how consumers access digital layers. For example, P2 considered the following, *"there could be an interim space between [the] QR code [it] doesn't necessarily have to direct to the digital. It could actually go to a message page where they [giver] downloads the digital from so they can actually put that message in which then includes that sort of nostalgia"*.

All producers (P1, P2, P3) agreed that guiding consumers (givers and recipients) through the process could be challenging and P3 mentioned the use of an instruc-

tional video to onboard consumers, *"**For consumers to understand it, you probably have to have a video demo**, yeah, of what it was they were getting and **you have to have quite clear terms and conditions** for them. So how long it would be there and that kind of thing, whether they'd be able to change it once it was uploaded?"*. Similarly, P2 added *"**there's the marketing education of the giver yeah, but then also the education to the receiver** and actually how it should be used and it's not just a marketing material from the person who's made the product"*. Lastly, P1 also highlighted the importance of integrating the digital content in an aesthetically pleasing way, as they produce ceramic baubles to hang on Christmas trees they mentioned *"it would have to look nice"*.

7.2.2 Producers view hybrid gifting as a way to promote connections with consumers via existing physical products:

Within the focus group producers contemplated their products becoming hybrid. Notably, producers did not think of a new physical product, they all tried to evaluate whether a digital layer would fit within an existing product. To this end, producers discussed the connections that could be elicited via a hybrid gift such as social bonding enabled via personalisation. Producers also noted that hybrid gifts may only be applicable in certain situations or occasions, to discuss this further the theme is split into three sub-themes.

The use of a hybrid gifting modality to evoke nostalgic emotions could enhance the social dimension afforded by products: Producers mentioned how hybrid gifting could be a way to transform products into meaningful, powerful, and sentimental gifts. For example, P2 noted the idea of a subscription-based model where consumers could pay to add new digital content every year to a physical gift, thus becoming part of annual social rituals like Christmas or birthdays and contributing to an ongoing connection with products and people. Moreover, P2

further noted marking social events and relationships with a hybrid gift, *"so you could do sort of a picture of when they first met, their first dates, where the proposed. So I think there's lots of little things that would go across different products"*.

Both P1 and P3 mentioned how a hybrid gift could enhance social relationships and circumstances by creating an emotional gift. For example, P1 mentioned, *"that's the thing about meaningful gifts, that there's an effort in thinking about them. There's a value actually paying for them. But* ***being able to add this other layer on that is almost like unquantifiable for me it's where things start becoming really more powerful"***. Similarly, P3 discussed how digital layers could enhance the value of physical gifts which in turn could promote social benefits, *"I think it might be a really good gift and make a relatively cheap item like a box of chocolates into like a really amazing and present"*.

Gift-producers view hybrid gifting as situation-specific: Gift producers discussed when and how hybrid gifts could be used. They noted that not every gift-giving scenario requires a highly personalised gift, *"[if] it's a big birthday, something special, so you might probably something that they like and then add that extra personalisation. But you know, for someone's 43rd birthday, you might just do the item because you know that's personalised enough. So I think it's going to be that* ***depending on what the reason for giving the gift"*** (P2). Relatedly, P2 went on to note that only certain gift-giving relationships may require a hybrid gift, *"and if it's someone that you see regularly or if it's someone you don't see very often"*.

Further, P3 mentions it would also depend on the price *"*"***you probably on a £5 box of chocolates wouldn't mind paying £5 to make it something special***. *But if you were giving a £15 personalised bauble you wouldn't want to spend much extra already. It's already got that personalisation, but it's already a very thoughtful gift. It would need to be quite a small price point to want to add a bit extra"*. However, P2 mentioned that it depends on the specific demographics and these hybrid gifts may be targeted to those with more disposable income.

Hybrid gifting is an opportunity to differentiate physical products via digital personalisation: Producers discussed the opportunities to add personal layers to their products in a different way as opposed to their current workflows. For example, hybrid gifting could provide their consumers with the freedom to personalise a physical gift and they could use media in a variety of ways to do this, *"[...] the multi-sensory thing because you can have them* ***[consumers] use a kind of video and it's not just a note written by someone you've never met*** *[...] It's a bit more personalised as well"* (P3).

On one other hand, P2 noted the potential difficulty of matching physical and digital objects to present a personalised narrative. They discussed physical plant markers they sell and how they could attach generic digital content about gardening to create a hybrid gift and to *"take that decision away from the end user"*. On the other hand, they also noted that by personalising physical products with digital content it could open up access to new markets.

7.2.3 Challenges and opportunities

This section will outline the findings from the nominal group technique as set out in section 7.1.3. Producers were asked to discuss and debate their 'top 5' challenges and opportunities they see relating to creating hybrid gifting products. Figure 7.5 summarises the five main challenges and opportunities that all producers agreed upon. As an observation, generally gift producers were able to reach a consensus quicker for the challenges as opposed to the opportunities which took longer to agree on.

Challenges	Opportunities
1. Education and on-boarding of givers and recipients.	1. Competitor edge of having a hybrid gifts to sell.
2. Cost to the business of investment in hybrid gifts.	2. Extra revenue, increased sales.
3. Technical set up of the digital part of a hybrid gift.	3. Added value to products especially less expensive gifts.
4. Time to maintain and create hybrid gift products.	4. New markets, access to those customers who want personalised gifts.
5. Designing the user experience of a hybrid gift.	5. Increased volume of sales via increased product range.

Figure 7.5: Top five challenges and opportunities of hybrid gifts according to gift producers

Firstly, producers debated multiple challenges throughout the focus group but when asked in the nominal group activity they all mentioned the number one concern relates to the onboarding and task of explaining what a hybrid gift is to both gift-givers and recipients. Following this, they jointly decided that the investment cost into technical and physical infrastructure could be a risk. Notably, despite technical skills and setup being a prominent discussion point throughout the focus group, producers positioned the technical setup as the third challenge. For example, they mentioned how they would create and store digital layers, what technologies to use, and how or if automation could take place. Producers then positioned their time at number four, they all considered the time constraints related to creating and maintaining hybrid gift products. Finally, producers felt that designing an aesthetic user experience could be challenging and considered how they would design the look and feel of hybrid gift products.

Secondly, producers were asked to think about the potential opportunities they see with creating a hybrid gift product. The number one opportunity producers agreed upon was the competitor edge that a hybrid gift product could afford, all noted that **they could be the first in their niche to have this type of product, thus**

differentiating them from their competitors. The second opportunity was the potential to increase their revenue if a hybrid gift could increase their sales. The third opportunity was the ability to add value to products for their consumers, with producers mentioning **how nostalgia could add value to cheaper gifts and make products more meaningful**. The fourth opportunity was the potential access hybrid gifts could provide to new markets or demographics, for example, those consumers who want highly personalised gifts. The final opportunity was the potential increase in the volume of sales because producers said they would be extending their product range, and the two things they aim for is both increased revenue and increased volume of sales.

7.3 Discussion

This discussion section is split into two main parts. The first outlines design considerations for producers, designers, or researchers interested in the hybrid products/gift space. The second part expands on a main contribution of this study: the role of the gift producer within hybrid gift exchanges.

7.3.1 Design Considerations

This section will present two main design considerations. The first is the way in which producers should balance technical possibilities with practical limitations. The second consideration is how producers can educate and onboard their consumers to the hybrid gifting process. Each consideration is based on findings and contextualised with relevant literature to discuss the challenges but also to highlight recommendations for producers and designers interested in the hybrid gifting/product space.

Balancing technical possibilities with practical limitations: Hybrid gifting presents new technical design challenges and opportunities. A range of technologies have previously been explored to make physical products hybrid. For example,

'living labels' is an application to tell digital stories in Augmented Reality (AR) which is accessed by using phone cameras pointed at a wine bottle label (Vrigkas et al. 2021). A further example identified in previous work (Gibson et al. 2023; Spence, Koleva, et al. 2023) and within this study, was the use of a QR code to access personal digital media as part of a gift. QR codes can be associated with advertising or marketing materials (Dou and Li 2008) and producers highlighted this within the focus group, stating the concern that recipients may ignore the QR code which contains the digital content. A related concern was the visual appeal of a QR code and how this would look on existing wrapping or packaging of gifts.

To address this, producers within the focus group evaluated the use of different technologies such as an RFID tag, where phones could tap a product to display the digital content. Whilst RFID tags may improve the aesthetic as they can be concealed or *hidden* because they are small clear stickers, it may make it more difficult for the recipient to know how or where to interact with the digital content. Therefore, this study agrees with the points made by Spence, Koleva, et al. (2023) in that producers' packaging and products can be complex and it may not be as simple as printing a QR code and attaching it to a card.

Despite debating technology types like AR, QR codes, and RFID tags, practically they may not be viable options for producers and there remains a challenge around the technical setup of hybrid gifts. Technology adoption within small businesses can often depend on environmental factors or personal characteristics of business owners (Peltier, Zhao, and Schibrowsky 2012). In this study, producers mentioned their technical skills as an environmental factor and explained they would be unsure of how to store personal data, how to host and create digital layers, and if their consumers' devices would work with their hybrid gift product. These concerns relate to privacy issues raised by Spence, Koleva, et al. (2023), who mentioned how gift producers should not be able to view personally sensitive messages attached to hybrid gifts.

Addressing these technical concerns raised by producers is difficult because each business has its own unique workflows, however, some of these areas can be looked at generally. Taking the storing and hosting of digital content challenge as an example, producers may already store personal data like names, addresses, or bank details of customers. They may use an off-the-shelf storefront platform to create their own website or sell on online marketplaces, in which case most of these platforms handle the storing and security of customer personal data. Moreover, **producers could consider outsourcing the handling of images/videos** as well, however, this may mean an increase in costs but would reduce the need for technical skills to set up and manage encrypted storage of personal data.

A related challenge is the length of time that digital content is stored for. This concern has been contemplated by both gift-givers and recipients in chapters 5 and 6, and now by gift producers within this study. A key part of sentimental gifts is that they are long-lasting and people want to cherish and keep things (Spence 2019; Kwon et al. 2017; Galak, Givi, and Williams 2016). Whilst a solution may be that the digital content is stored indefinitely meaning that a consumer can *scan* a QR code and access their gift anytime in the future. On the other hand, for practical reasons, producers may need to limit the availability of content for a defined period due to costs, maintenance, or compliance reasons. Either way, the topic of consumer trust and online purchasing has long been an area of debate and consideration (Hoffman, Novak, and Peralta 1999) and **in more recent decades the methods of online personalisation of products has increased** (Mugge, Schoormans, and Schifferstein 2009). Thus, **producers should consider a transparent approach** in presenting clear terms around personal data storage to minimise *"strong negative responses to disclosures of personal information"* (Martin, Borah, and Palmatier 2017) (p.36).

Educating and onboarding consumers: Producers all agreed that their most prominent concern was educating gift-givers and recipients and noted the task of explaining what a hybrid gift is. Producers also mentioned that they felt unable to

tackle this challenge alone as sole traders/SMEs and would feel more comfortable if larger organisations paved the way for a general understanding of the concept. Whilst Spence, Koleva, et al. (2023) is one academic example of a producer engaging with a hybrid gift product, there have been several emerging commercial examples of companies integrating digital content with their physical products (Moonpig video message card (Moonpig 2023), Jo Malone Video Gift Messaging and Voice Recording Gifts (JoMalone 2023)). This section will expand on recommendations for producers or designers on educating consumers on hybrid products.

Naming of hybrid gifts: Firstly, producers should consider how they name their products. Whilst consumers may be familiar with the term hybrid or perhaps even interacted with a hybrid product to engage with marketing promotions (Dou and Li 2008) e.g. scanning a QR code on a product to enter a competition, **they may not know what is meant by a hybrid gift**. Notably, existing commercial examples (JoMalone 2023; Moonpig 2023) use terms like *video gift message* instead of hybrid gifting. **Perhaps hybrid gifting is not a suitable consumer-facing term to help with explaining the concept**. Further, producers should consider how they frame the creation process. For example, '*capture* a video gift message' is different to '*upload* a video gift message' especially if the framing is nostalgia which is associated more with uploading content as opposed to capturing new media. Thus, **producers should contemplate the language they use to help with onboarding consumers.**

Use dynamic media for explanations: One key method used in previous work (chapter 6) and commercially is the use of quick videos to onboard gift-givers to the process and to distill instructions on what they are creating and how it works. Perhaps one design recommendation would be to display instructions to givers in a dynamic way via either videos, GIFS, or icons, however, this may depend on individual producer/designer circumstances and the resources they have available.

Framing hybrid gifts: Producers should consider how they frame hybrid gifts

to their consumers. This thesis has highlighted the unique framing of hybrid gifts with nostalgia or personal memories. This is just one example of guiding consumers through a hybrid gift process. For example, producers could consider firstly why consumers become emotionally bonded with a personalised product e.g. appearance, quality, and memories of people or events (Mugge, Schoormans, and Schifferstein 2009). Producers may think of ways this could be integrated with digital content and could help them to consider specific social circumstances. For example, those who are geographically far apart (Neustaedter and Greenberg 2012; Wilding et al. 2020) producers could frame hybrid products for their specific social needs and guide consumers through the creation process with prompts. Overall, **social dimensions should be an important consideration when framing hybrid gifts** which relates to certain gifts being situation-specific (Belk, Russell W 1982).

Guidance for the recipient: Spence, Koleva, et al. (2023) highlight the challenge of managing the reveal of a hybrid gift when the giver is not present. Producers in this study also voiced their concerns about having to explain what a hybrid gift is to both giver and recipient. Customer touchpoints are an important consideration of any digital product design (Jannah, Rahadi, and Aprianingsih 2022), **producers should carefully consider the stages of gifting in particular the reveal stage** as set out by Kwon et al. (2017). This stage of gifting includes the unwrapping part. **Gift producers could intentionally design the order of unwrapping**, e.g. digital first then physical. Physical provisions could be put in place to ensure the recipient can see the QR code or technology access method to the digital layer. For example, a ribbon that attaches the digital layer with a brief instruction. Overall, producers should carefully design recipient touchpoints and **contemplate how to present hybrid gifts physically through packaging or wrapping.**

Overall, there are several design considerations for producers and designers to reflect on which range from technology skills, effort, time, cost, educating consumers, naming, and framing of hybrid gifts. Despite these challenges, examples of hybrid gifts have emerged commercially in large organisations and the findings from this study

may be a starting point for SMEs to develop their products into hybrid versions. Additionally, this work has uncovered new knowledge on the role of the producer within hybrid gift exchanges which the next section will expand on.

7.3.2 The Role of the Producer in Hybrid Gift Exchanges

To reflect on chapter 5 and work by Gibson et al. (2023) and Spence, Koleva, et al. (2023), the roles involved within a nostalgic hybrid gift exchange have previously been outlined: gift-giver, recipient, media, nostalgia, and hybridity. This study uniquely contributes to these roles by outlining the role of the gift producer within hybrid gift exchanges.

The first role of the producer is to carefully consider their motivations, challenges, and opportunities of producing hybrid gifts. Secondly, they need to manage the technical side of the hybrid gift, in that they must consider privacy, copyright, storing personal data, and managing the digital layer creation process. This could either be done personally depending on the individuals skills and experiences, or outsourced to help with automation and workflows. The third role is to design customer touchpoints to successfully onboard the gift-giver and explain to consumers what a hybrid gift is. The final role relates to a tension outlined by (ibid.) and the producers in this study, where they must manage the reveal of the gift. Further, this work highlights that the producer must educate the recipient to guide them through the exchange.

To summarise, hybrid gifting is still an emerging modality despite the existing examples in large organisations, it's difficult for SMEs to quickly embrace this way of producing products due to the different skills and layers involved. Moreover, these insights may differ dependant on the scale of business and the types of products that are produced. The findings from this study are specific to smaller artisan craft producers as opposed to large organisations. For example, producers involved in this study discussed being solely responsible and involved in every part of the hy-

brid gift production, whereas in a larger organisation this responsibility may become distributed and more automated.

This role is a starting point in understanding producers' opinions on hybrid gifting and there is an opportunity for researchers to explore this role further in the hybrid product or interaction design space.

7.4 Chapter Summary

Motivated by previous work (chapters 4, 5, 6) this study set out to engage with gift producers (an SME that markets products hand-made or otherwise that could be gifted). The study set out to address the following research question: *What are gift producer opinions on the potential challenges and opportunities of creating hybrid gift products?*.

In total 3 gift producers were recruited and through qualitative methods (focus group, ideation, and a nominal group technique) the concept of hybrid gifting was presented and discussed with producers.

A thematic analysis of focus group data generated two main themes with appropriate sub-themes in each:

1. Producer experience (PX) impacts the feasibility of creating hybrid gift products.
2. Producers view hybrid gifting as a way to promote connections with consumers via existing physical products.

The findings from the nominal group technique highlighted the top five challenges and opportunities that all producers agreed upon. Challenges ranged from the education and onboarding of givers and recipients to designing the user experience. Opportunities ranged from having a competitor edge to an increased volume of sales. All challenges and opportunities can be viewed in Figure 7.5.

The main takeaways from this study are presented in the discussion section 7.3 and are summarised in the following design considerations for producers, researchers, or designers:

1. Although several types of technologies could be integrated with hybrid gifts (AR, RFID, QR codes), producers should consider environmental factors (own technical skills, cost, time) and the practical limitations of set up and maintenance of technologies.

2. Personal data of consumers should be encrypted and stored securely and should not be viewed by producers.

3. Producers should consider a transparent approach in presenting clear terms around personal data storage e.g. how long they will store digital layers.

4. Producers should consider the naming of hybrid gifts in consumer-facing language e.g. video gift message.

5. Videos and icons can be used to explain the process of hybrid gifting to gift-givers at the point of creation/purchase.

6. Nostalgia is one example to frame hybrid gifting, producers should consider other framing or social circumstance to appeal to consumer needs.

7. Producers could consider how physical packaging or wrapping would be used to distil instructions or guidance to recipients.

The other main contribution of this work is a new understanding relating to the role of the gift producer in hybrid gift exchanges. This includes the role of managing the technical side or outsourcing it and designing customer interactions or touchpoints for both the gift-giver and recipient.

It is anticipated that the insights from this study could apply to gift producers, designers, or researchers interested in hybrid products, interaction design, or technology-mediated reflection. Overall, chapters 4, 5, 6 uncovered the roles and experiences of gift-giver and recipient in hybrid gift exchanges **and now this chap-**

ter presents the role and experience of producer which contributes to a wider understanding of the hybrid gifting modality from multiple perspectives.

Chapter 8

Discussion and Reflection

This chapter aims to reflect on the findings from all four studies presented in this thesis. The chapter is split into two main parts. The first outlines the unique theoretical contributions of the work and contextualises the findings via relevant literature and debates. The second part outlines three key practical design implications for researchers, designers, or gift-producers interested in the spaces of rituals, nostalgia, or hybrid products.

8.1 Introduction

This thesis set out to explore the concept of evoking nostalgic emotions via a hybrid gifting modality. Despite gifting being a widely researched social phenomenon in multiple fields, there remained a prominent gap in extant literature. For example, Kwon et al. (2017) and Koleva et al. (2020) proposed the hybrid gifting modality, yet the full emotional possibilities of merging physical and digital objects within an exchange remained unclear. To address the research gaps, four studies were carried out.

The first study of the Memory Machine (chapter 4) set out to explore the concept of transforming media and memories into a digital gift from a gift-giver perspective. As hybrid gifting is an emerging topic, it was deemed necessary to capture gift-giver views in-depth before engaging with recipients or exchanges. Following this, the Nostalgic Gifting Study (chapter 5) built upon gift-giver experiences to capture hybrid exchanges between dyadic relationships. The third study entitled the Tailored Gifting Study (chapter 6) focused on providing more freedom to gift-givers to understand the impacts on nostalgic experiences of both giver and recipient. The fourth and final study, the Gift Producer Study (chapter 7) focused on presenting key findings from previous studies to gift producers to capture their views on nostalgic emotions and the hybrid gifting modality.

The findings from all four studies provided insight into the considerations of evoking nostalgic emotions via hybrid gifting modality from the unique perspectives of gift producer, giver, and recipient. This section is made up of two main parts. The first brings together experiences across all four studies to outline the theoretical contributions of the thesis and contextualise the work within relevant literature and debates. Secondly, the final part outlines practical implications and potential design considerations relating to nostalgia, hybrid products, and rituals.

8.2 Theoretical Contribution

This section aims to set out the unique contributions of this thesis by elaborating on the key discussion points and contextualise the work within existing literature. There are four main areas that this work contributes to:

1. Bittersweet nostalgia facilitated by hybrid gift exchanges
2. Objects in hybrid gift exchanges
3. Technologies and hybrid gifts
4. Meaningful relationships

8.2.1 Bittersweet nostalgia facilitated by hybrid gift exchanges

This thesis focused on nostalgic emotions. Nostalgia was previously outlined in detail within section 2.3.1 and was defined as 'a joy tinged with sadness' (Werman 1977). Nostalgia can be evoked from both physical and digital possessions (Wildschut, Sedikides, et al. 2006) and studies within HCI have focused on technology-mediated reminiscence or reflection (Odom, Banks, Kirk, et al. 2012; Odom, Wakkary, et al. 2019; Nilsson, Johansson, and Håkansson 2003), but **none had addressed the concept of gifting personal media-memories**. Based on the four studies presented in this thesis, there are three unique theoretical contributions relating to emotions within hybrid gift exchanges:

1. Defining what a nostalgic hybrid gift is.
2. How nostalgic emotions integrate within hybrid gift exchanges.
3. The impacts of nostalgia on hybrid gift exchanges.

Firstly, as mentioned in section 2.3.1 nostalgia has multiple classifications and definitions which made the design of a gift that evokes nostalgia particularly challenging. As a starting point, the way we feel emotions was explored. One key way to evoke emotion is via revisiting the past and reminiscing (Bluck and Levine 1998). The

act of recalling formative memories or fond past times can promote nostalgic feelings of longing, loss, joy, and regret (Wildschut, Sedikides, et al. 2006; Holak and Havlena 1992) because of happiness that memories can bring, but also the sadness and reminder of the '*"irreversibility of time"* (Boym 2007) (p.8).

The thesis began with a speculative definition of a nostalgic hybrid gift: *"a gift that intends to create nostalgic emotional experiences"*. New knowledge generated by addressing research questions (1.What are the considerations for embedding or evoking nostalgia in a hybrid gift exchange? and, 3.What are the roles and perspectives of the gift-giver, recipient, and producer within hybrid gift exchanges?) meant the definition was able to evolve: *"a giver-centric, multi-sensory modality of gifting which enables the transfer of shared memories, relationships, gratitude, and a physical object which can result in emotional, bittersweet, and nostalgic recall for both giver and receiver".*

To highlight the limitations of this definition, nostalgic hybrid gifts are not resistant to debates surrounding nostalgia being a subjective set of personal emotions (Pascal, Sprott, and Muehling 2002; Merchant, LaTour, et al. 2013; Batcho 1995). **Nostalgic hybrid gifts are not suitable for all occasions, people, or products.** The gift-giver has to know the recipient well to lean on a shared nostalgic memory, and even then, they may be unsure what makes the other person feel nostalgic. Within chapter 7 gift producers pointed out that not every occasion requires a highly personalised nostalgic gift and thus they may be unsuitable in some circumstances. Hybrid gifts fall into the situation-specific category as outlined by Belk, Russell W (1982).

Secondly, before undertaking this thesis, it was unclear if and how nostalgic emotions could integrate and become part of the hybrid gifting modality. The four presented studies explored elements of leveraging physical and digital objects to understand how nostalgic emotions may manifest within hybrid exchanges. One prominent way to imbue nostalgic emotions is within the preparation stage of exchanges. The gift-giver is the person who decides what memory to gift and why, they define the

direction of the nostalgic emotions. Gift-givers are supported throughout this stage by guidance or prompts such as, 'think back to a fond memory you would like to gift to someone else'. Findings from the Memory Machine (chapter 4) outline the importance of a cue or prompt, whilst the Tailored Gifting Study (chapter 6) highlighted how **prompts can get the gift-giver to think of an inspiration, theme, or memory to base their gift on.**

A further novel contribution of this thesis is how the combination of physical and digital objects can be used to craft a nostalgic narrative. Specifically, within chapter 6 objects within hybrid exchanges were matched to present a nostalgic memory from gift-giver to recipient. The hybrid way of presenting nostalgic memories contributes towards existing debates in the field of HCI regarding if media can only be shared as opposed to gifted (Giesler 2006; R. Belk 2010; Golsteijn et al. 2012) and how digital gifts can lack visible effort or sentiment (Kwon et al. 2017). The presented four studies argue that nostalgic digital layers are viewed as **gifts** within hybrid exchanges, and the effort that goes into selecting a nostalgic memory contributes towards a meaningful and thoughtful gift (chapter 5), thus offering an alternative viewpoint from previous work in the field. On the other hand, it should be noted that nostalgic hybrid gifts can be subjective like other modalities of exchange (Blau 2017; Sherry 1983) and ultimately it's up to the recipient to decide what they deem a 'gift'.

Thirdly, both nostalgia and gifting can impact social circumstance and relationships (Sherry 1983; Ruth, Otnes, and Brunel 1999; M. K. Ward and Broniarczyk 2016). Despite thematic links the combination of nostalgia and gifting had not been considered. Based on the presented studies, **nostalgia impacts the probability of a successful gift** due to the psychological benefits elicited when nostalgia is present within an exchange. Presenting nostalgic memories as a digital layer uncovered how the gift exchange could be enhanced via overlaying media to convey nostalgic narratives, and in some cases **bring memories to life via a multi-sensory gift. Nostalgia adds another social dimension to hybrid gift exchanges.**

To further outline the impacts of nostalgia within hybrid gifts, the five-stage model by Kwon et al. (2017) was revisited (explained fully in section 2.1.4). As argued within chapter 5, there are items to append to the model within each gifting stage when nostalgia is involved in a hybrid gift exchange. Examples include how gift-givers share memories with others externally, how the recipient has to interpret the meaning of the nostalgic memory, and how nostalgia promoted gratitude within the reflection stage for recipients. Overall, the five gifting stages are persistent in nostalgic hybrid gift exchanges however each stage may include additional tasks or activities.

From a commercial perspective, nostalgia is sometimes used as a tool for brands to connect with their consumers (Merchant and Rose 2012; Merchant, LaTour, et al. 2013). Based on chapter 7 gift producers view nostalgic hybrid gifts as an opportunity to add value to their physical products, not just in a monetary way but to add emotional value to their products to enable consumers to connect and communicate. Thus, differing from previously outlined commercial uses of nostalgia within Section 2.3.4.

To summarise, this thesis provides new knowledge on the place, purpose, and positive and negative impacts of nostalgia within hybrid gift exchanges. Overall, prominent threads persisting throughout each of the studies relating to the **uses, impact, and emotional value nostalgia can add to a hybrid gift exchange** and a key part of this was due to the physical object digital layers were presented with.

8.2.2 Objects in hybrid gift exchanges

Gifts typically contain a physical item or product (Sherry 1983; Galak, Givi, and Williams 2016; Ruffle 1999; Davis 1972), on the other hand, digital gifts contain virtual items like images, vouchers, music, and subscriptions. This thesis set out to understand the **possibilities of merging physical and digital objects** within a hybrid gift exchange and found the following unique theoretical contributions:

1. Hybrid gifting gives 'form' to a collection of media.
2. The role of physical products in hybrid exchanges.
3. Affordances of merging physical and digital in a hybrid exchange.

Each of the above items will be discussed in turn. Firstly, Odom, Zimmerman, and Forlizzi (2014) outlined the concept of 'formlessness' in relation to digital possessions, stating that *"virtual possessions have a quality of formlessness in the sense that they can be easily reproduced, making it difficult to differentiate 'the original' from a copy" (p.990).* Formlessness in digital possessions is often due to the vast and disorganised nature of documenting and storing various media types. Within this thesis and particularly in the study of MeMa (chapter 4) it is argued gifting can give **form** to a collection of media.

Existing work by Petrelli, Whittaker, and Brockmeier (2008) and Golsteijn et al. (2012) distinguishes how digital material can contribute to storytelling and based on this thesis, it is argued that nostalgic storytelling helps to contextualise media and thus contributes to providing **form** or **meaning** to a collection of media. Related to contextualisation, how media can be overlayed contributes to a high-fidelity memory cue, meaning that the new combination of media transforms into a **rich new possession**. Overall, the framing of gifting and combination of multiple media types counteracts the *formlessness* of digital possessions.

The second novel contribution relating to objects is the extended knowledge on the place and function of physical products within hybrid gift exchanges. Traditionally, gifting rituals involve wrapping physical objects to provide a sense of surprise (Ruffle 1999). Material gifts are popular due to their readiness to use directly after the moment of exchange (Galak, Givi, and Williams 2016). These physical items can contribute to a sense of self and ownership (Belk, Russell W 1988), and unsurprisingly in the opening study of this thesis (MeMa chapter 4), participants mentioned the importance of having something tangible within a gift exchange.

Throughout this thesis, studies have explored elements of combining memories, nostalgic emotions, and physical products (see Figure 8.1). The first study of MeMa explored the concept **of media-memories being classed as a gift**, although the study did not include a physical gift item, it did include a physical tablet. Some participants from the study contemplated the idea of gifting the actual MeMa tablet, whereas others explained the importance of having a tangible item as part of a gift exchange.

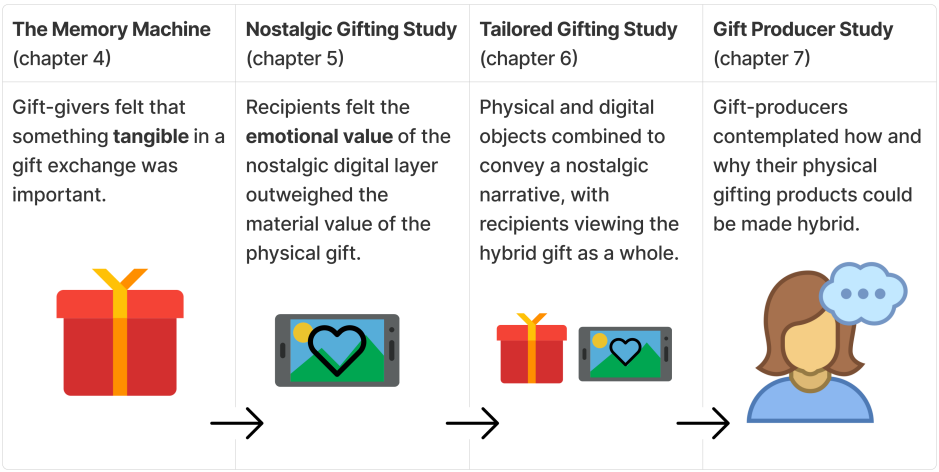


Figure 8.1: The place of physical objects throughout each study

Following on from MeMa, the Nostalgic Gifting Study combined a physical chocolate box and a QR code that presented a personal nostalgic memory when scanned. The physical chocolate box within that study was viewed as a **bonus**, with participants getting the most emotional value from the nostalgic digital layer. Subsequently, the Tailored Gifting Study aimed to provide freedom to gift-givers to select any physical gift and a personal nostalgic digital layer. Findings from this study showed that when **physical and digital objects are matched they are viewed as a whole gift**. The final study (Gift Producer Study), focused on providing gift producers with findings from previous work to capture their views on nostalgic hybrid gifts. An aim was to understand **expert opinion on the use of physical gifts in hybrid exchanges**. Findings highlighted practical considerations of producers such

as time, cost, and effort. To this end, gift producers also noted that emotional nostalgic content combined with their existing products could afford a new type of personalisaton.

Overall, before undertaking the studies within this thesis it was clear that physical objects certainly have an important role within gift exchanges (Sherry 1983; Galak, Givi, and Williams 2016; Ruffle 1999; Davis 1972), yet it was unclear what role they would play when combined with a nostalgic digital layer. Throughout the four studies in this thesis, the evolution of knowledge is clear. **In the case of nostalgic hybrid gifts, physical and digital objects are best matched to convey a coherent nostalgic narrative**, but as pointed out by multiple participants throughout each study, **hybrid gifting is situation specific**, it depends on the occasion, the recipient, the giver, shared memories, and the physical product.

Thirdly, the final novel contribution relating to objects is the affordances of merging physical and digital within hybrid gift exchanges. There are four prominent affordances uncovered throughout the studies in this thesis, they are presented in Figure 8.2.

The first affordance to be discussed is **a memorable exchange**. Branco-Illodo and Heath (2020) previously outlined that the *best* gifts represent formative life events to communicate symbolic messages, in turn making exchanges **memorable**. It's clear that in some circumstances gift-givers want to make an exchange memorable, but it may not always be clear how to transform objects into a meaningful gift. On the other hand, Koleva et al. (2020), discusses the possibilities of combining physical and digital to create memorable user experiences.

In the case of this thesis, it is argued that the combination of an unfamiliar hybrid gifting modality paired with personal nostalgic media afforded memorable gift exchanges. In brief, this work demonstrates **a new practical way in which nostalgia can be embedded into exchanges via physical and digital goods** to promote a memorable gift exchange.

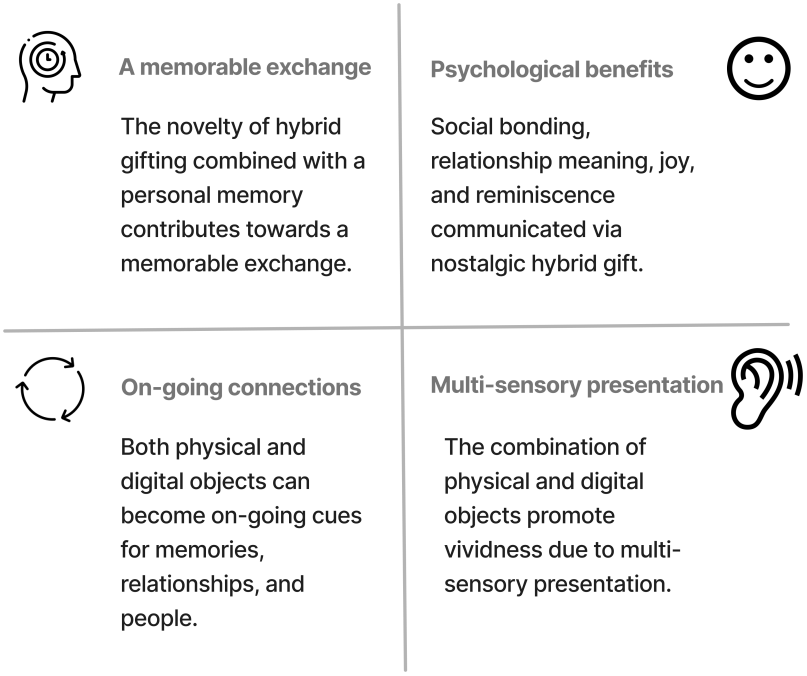


Figure 8.2: Affordances of objects within hybrid gift exchanges

The second affordance relates to the potential **psychological benefits** of nostalgic hybrid gift exchanges. Nostalgia is known for eliciting bittersweet feelings (Batcho 1995), including negative emotions of sadness, loss, and regret (Holak and Havlena 1992; Wildschut, Sedikides, et al. 2006). On the other hand, positive emotions such as joy are correlated to acts of social sharing of a past time, which can increase a sense of meaning in life (Wildschut, Sedikides, et al. 2006; Routledge et al. 2012).

Throughout the four studies in this thesis there were elements of nostalgia promoting psychological benefits with participants feeling close within their relationships because of the reaffirmation their hybrid gift provided, or how reminiscing on nostalgic memories made them feel grateful. Before these studies were completed, the contents of nostalgic experiences were clear, but this work provides insight into **new well-being benefits afforded via a nostalgic hybrid gifting modality**. For example, in chapter 5 Participant 4A mentioned how they had a bad day at work and creating the gift cheered them up. Moreover, Most recipients specifically mentioned feeling grateful for their gift (1B, 2B, 3B, 4B, 5B, 7B, 9B) and participant

7B discussed how opening the gift made them slow down when they were in a rush and reflect. From chapter 6, participant 4A mentioned they felt happy getting to re-experience memories. Moreover, this unique contribution demonstrates work by Benford, Greenhalgh, et al. (2012) on *uncomfortable interactions*, where in the case of this thesis, participants go through the negative emotions of nostalgia to get to the psychological benefits. Such as, in chapter 5, where 7A said they felt sad about their daughters childhood going so fast but was happy because of all the happy memories they shared.

The third affordance of objects within nostalgic hybrid gift exchanges relates to **on-going connections**. Inalienability is how objects can inherit a sense of the person who gave it (Weiner 1992), with Spence (2019) arguing that both physical and digital possessions have inalienable proprieties. This thesis and in particular the Tailored Gifting Study (chapter 6) provides an in-depth understanding of inalienability relating to objects in hybrid gift exchanges. For example, the combination of **matched physical and digital objects to present a nostalgic memory creates a high-fidelity memory cue**. This relates to objects acting as reminders of memories, relationships, the exchange, and people. Having said that, producers within chapter 7 note that not all products can be matched to a memory and there are certain occasions when a hybrid modality is more suitable than others.

Moreover, the on-going connections relate to similar work on tangibility of digital artefacts such as work by Odom, Wakkary, et al. (2019) that developed 'Olly' a physical artifact to embody digital music collections. Further, work by Petrelli, Whittaker, and Brockmeier (2008) demonstrated the desire of participants to have a physical space for their digital mementos in the home such as embodied objects augmented with digital information. Examples from this thesis include, chapter 6 when participant 3B explained they were going to stick their QR code next to their physical gift of a map on the wall as a reminder of the gift and memory. Thus, promoting on-going connections with digital material. Further, Participant 5B in chapter 5 mentions keeping their QR code in their art journal book to display and

keep the digital memory somewhere physical.

The fourth and final affordance of objects is the **multi-sensory presentation**. All five senses (visual, auditory, taste, tactile, and olfactory) can bring back memories, with studies outlining the possibilities for rich reminiscence when memories are presented or cued in a multi-sensory format (Mishra et al. 2021; Mullins et al. 2022). Yet, before this thesis, the implications of a multi-sensory gift were unclear. Based on chapter 6, **a hybrid gifting modality affords vividness due to the rich presentation of a nostalgic memory via both physical and digital objects**. For example, hybrid gifts can include a product to hold, smell, and feel, whereas the digital layer can be a visual and auditory cue for reminiscence. In short, hybrid gifting is a way to present a cohesive nostalgic narrative: physical and digital objects can be leveraged to present a **vivid and multi-sensory gift.**

8.2.3 Technologies and hybrid gifts

A main consideration within each of the presented studies was the technology that was used to create, present, and access nostalgic digital layers. In this section, three unique contributions are outlined and discussed:

1. The use of QR codes in hybrid gift exchanges.
2. Producer views on technologies for hybrid product design.
3. Communicating via technologies within hybrid gift exchanges.

The use of QR codes in hybrid gift exchanges: Throughout chapters 5 and 6 participants generally had no technical issues scanning or accessing QR codes. On the other hand, participants noted that outside of the study the QR code could be mistaken for marketing materials by recipients, as QR codes are a popular choice in marketing for brands to engage with consumers (Dou and Li 2008). Similarly, within the producer study (chapter 7) participants noted that the user experience should be carefully designed to ensure it is clear to consumers that QR codes are not marketing material, which also relates to some participant's concerns from chapter

6 who stated they do not find a QR code aesthetically pleasing.

Despite familiarity and ease of use for consumers, some producers in chapter 7 were concerned about the technical skills to create the digital content for the QR code. Moreover, producers noted that if the process for creating the QR code and digital layers could be automated it would save time and minimise the technical skills required.

Overall gift producers, givers, and recipients all felt that QR codes were a simple and successful technology to create and access nostalgic digital layers. However, in future, there may be ways to elevate the design to make them more appealing within a gift exchange and whilst most participants opted to keep their QR codes some felt it was ***just a QR code*** and attached no sentimental value to it.

Producer views on technologies for hybrid product design: Few works within academia have specifically engaged with gift producers (Razaq, Kolko, and Hsieh 2022; Spence, Koleva, et al. 2023), a unique contribution of this thesis was the gathering of unique gift producers' viewpoints on nostalgic hybrid gifts and what this may practically mean outside of academia. Overall, within chapter 7 producers highlighted both opportunities and challenges of technologies and hybrid gift products.

Overall, producers were aware of their technical capabilities and asked questions about data storage, hosting digital content, copyright, and ownership. As producers were mainly sole traders, they undertake all roles and tasks within their business and generally felt cautious about implementing the technology themselves. Despite reservations, producers did mention the potential opportunities that could be afforded via using technologies like a QR code to represent personal memories. For example, access to new customers, the potential for consumers to connect via digital layers, and how technologies could add value to existing physical products.

Communicating via technologies within hybrid gift exchanges: Technologies offer multiple channels of communication and research in this space ranges from

playful interactions to maintaining long-distance familial or romantic relationships (Vetere et al. 2009; Shin et al. 2021; Neustaedter and Greenberg 2012; Musick, Freeman, and McNeese 2021). The presented studies in this thesis offer a different method of communication via a hybrid gift.

The study of MeMa (chapter 4) was the foundation for other studies outlined within this thesis. MeMa set out to understand how digital media-memories could be used for communicating and highlighted the possibilities of conversation, social bonding, and giver motivations of wanting to gift a memory via technology, which can afford a **lasting and sentimental gift**. Following MeMa, the remaining studies were able to uncover how a hybrid modality facilitated communication between people.

As mentioned in section 8.2.2, physical items can communicate sentiment and meaning within gift exchanges (Sherry 1983; Galak, Givi, and Williams 2016; Ruffle 1999; Davis 1972), yet it remained unclear how the introduction of technology within a gift exchange may impact the communicative function of a gift. Based on the presented studies **hybrid gifting offers a platform to present both subtle and explicit narratives** because of the freedom to represent a nostalgic memory via media, accessed via the familiarity of a QR code. Further, because the digital content is displayed on the recipient's device, many opted to screenshot the content to *keep* it or share it on social media with others and thus open a dialogue about the gift.

Overall, this thesis presents unique contributions regarding the uses of QR codes in hybrid gift exchanges, the technical considerations of creating hybrid gifts from a producer viewpoint, and how a hybrid gift promotes a new way of communication facilitated by technology and objects.

8.2.4 Meaningful relationships

Multiple gifting works agree with Maussian views that gifts can include the transfer of emotions, **relationships**, and objects (Blau 2017; Mauss 1966; Befu 1977).

Throughout the four studies presented in this thesis, elements of relationships have remained persistent. This section outlines three areas relating to relationships and nostalgic hybrid gift exchanges.

1. Motivation for gifting memories.
2. Roles involved within hybrid exchanges.
3. Impact of hybrid gifts on relationships.

Motivation for gifting memories: At the beginning of a gift exchange the Preparation stage involves motivation from the gift-giver to search, craft, or purchase a gift (Kwon et al. 2017). There are multiple types of motivations and considerations that givers contemplate before deciding on a suitable gift (outlined in full within section 2.1.2). For example, motivations can range from altruistic to egotistical (M. K. Ward and Broniarczyk 2016) and gifts can be either giver or recipient centric (Aknin and Human 2015). Before undertaking this work, the motivation for gifting a memory recollection remained notably absent, however, Alea and Bluck (2003) note that sharing autobiographical memories can serve social functions to give advice, promote intimacy, and empathy to reassure others. Based on conducted work in this thesis, **there are multiple reasons why gift-givers want to gift memory recollections**:

1. For legacy purposes.
2. To promote conversation with others.
3. To tell a story.
4. To preserve the past.
5. To remind others of the past.

Firstly, within the study of MeMa (chapter 4) givers mentioned they wanted to pass on a legacy to younger generations and one way of doing this was via gifting memory recollections. Secondly, memories are gifted because people want to have a conver-

sation in person or anticipate the next time they speak with their recipient they'll reminiscence together on the past (chapter 4 and chapter 5). Thirdly, givers view gifting memories as **a creative way to vividly tell a story via a combination of objects** (chapters 4, 5, and 6). Fourthly, givers may opt to preserve the past via gifting, for example gifting memories about those who have passed away and in a sense keep the memory of them alive (chapter 4), which is a different take on digital afterlives and inheritance of digital memories (Bassett 2021). Finally, throughout chapters 4, 5, and 6 participants mentioned how they are motivated to send a memory recollection as a gift simply because it's a pleasant reminder of the past for their recipient.

Roles involved within hybrid exchanges: Before undertaking this thesis it was unclear what roles would be involved in nostalgic hybrid gifts for the giver, recipient, or producer. Kwon et al. (2017) set out the involvement of giver and recipient throughout key stages within a gift exchange, which helped to outline key roles within chapters 5 and 6. Based on extant literature and work conducted in this thesis, Figure 8.3 sets out the unique roles of gift producer, giver, and recipient.

Gift Producer	Gift-Giver	Gift Recipient
• On-boarding gift-giver. • Educating recipient. • Designing customer touchpoints. • Setting up and storing digital content.	• Decide on a theme or inspiration for objects. • Select and upload media for the digital layer. • Self-reflect on the past.	• Interpret objects and their meaning. • Communicate with the giver. • Reflect on the gift and relationships.

Figure 8.3: Roles of producer, giver, and recipient in hybrid gift exchanges

Figure 8.3 helps to **go beyond interpersonal relationships and look at the**

relationships and roles between producer, giver, and recipient. Each has their purpose and tasks within a nostalgic hybrid gift exchange. The producer has the task of explaining what a hybrid gift is and educating both the giver and recipient, whilst also facilitating the uploading, storing, and accessing of the digital content (chapter 7). The giver has to have an inspiration or theme for the gift (chapter 4), they are tasked with reflecting on the past and searching for media to represent their chosen narrative. Finally, the recipient deciphers the intended meaning behind physical and digital objects, they communicate with their giver and have an ongoing connection to the exchange, objects, and their relationships. In brief, **this work has not only uncovered unique roles of gift-producer, giver, and recipient within hybrid exchanges but their relationship and dependencies on each other.**

Impact of hybrid gifts on relationships: Gifts can have many impacts on relationships with Sherry (1983) outlining four outcomes; strengthen, affirm, attenuate, and sever. In addition to these outcomes, Ruth, Otnes, and Brunel (1999) highlight both the long and short terms impacts of gifts and specifically discuss how relationships are only altered based upon the recipient's perspective of the gift. More contemporary works within HCI discuss how technologies can help to maintain relationships particularly when located geographically far apart (Shin et al. 2021; Neustaedter and Greenberg 2012). Despite existing knowledge on how gifts can impact relationships and how technologies can promote closeness, there remained a notable gap in combining the two areas.

Throughout the studies presented in this thesis, new knowledge has been uncovered that relates to the impact on relationships of nostalgic hybrid gifts. The first impact is how all 36 cases throughout chapters 5 and 6 gift-givers and recipients felt their relationship had been reaffirmed or strengthened because of the hybrid gift. For example, themes of gratitude and effort were present in both studies with recipients noting how the nostalgic memory made them realise how well their gift-giver knew them (chapter 5), or how the combination of physical and digital objects was a vivid

reminder of a shared past which promoted closeness (chapter 6).

As well as strengthening relationships, **the potential use to maintain relationships via hybrid gifting modality** was highlighted within all four studies. Participants generally felt a hybrid gift was a way to communicate sentiment to others and especially to those who may live far apart. For example, recipients who were not co-located felt the gift brought them closer to their gift-giver. Producers within chapter 7 also noted the potential social dimension that could be added to physical products via a nostalgic digital layer. Based on these experiences, **it is argued that nostalgic hybrid gifts afford a new way of asynchronously communicating via a combination of objects and media which in turn helps to maintain relationships when geographically far apart.**

Lastly, gift-givers were aware of the potential negative impacts hybrid gifts may have on their relationships, resulting in gifting anxiety or worry. Sherry (1983) notes the reformulation stage is when giver-recipient relationships can be influenced in an exchange and Wooten (2000) describes how gift novelty can increase gift-giver anxiety. Uniquely, this thesis uncovered that within hybrid gift exchanges, gift-givers experienced a range of anxiety, doubt, and worry around their recipient *understanding* the gift. Givers anticipated their recipient may not remember the photograph and they couldn't predict how they would feel about receiving a hybrid gift because it was a new modality. On the other hand, some recipients within chapter 6 stated how their givers *"know me so well"* and generally givers' worries were unfounded.

8.3 Design Implications

This multidisciplinary thesis has uncovered theoretical contributions in the areas of technologies, gifting, nostalgia, and relationships. This section aims to distil these contributions into more practical design considerations for those interested in researching, designing, crafting, and producing in the rituals or technology-mediated

reflection space.

8.3.1 Rituals and technologies

As set out in section 2.1.5, rituals are a set of acts or practices related to cultural patterns of societies (Giovagnoli 2017). The ritual space is widely researched in multiple disciplines and notable examples within HCI have focused on rituals of letting go (Sas, Whittaker, and Zimmerman 2016; Odom, Banks, and Kirk 2010), bereavement (Wallace et al. 2020; Jung et al. 2023), gifting (Koleva et al. 2020; Kwon et al. 2017), and Christmas (Petrelli and Light 2014). This thesis has contributed to discourse in HCI and beyond via design implications for researching or crafting social rituals.

Firstly, **rituals require a considered use of technology.** Building upon similar ritual studies and the four studies presented within the thesis, **rituals should be researched both respectfully and safely**. This means evaluating technologies carefully before embedding them. For example, gifting rituals involve searching, wrapping, anticipation, unwrapping, reflecting, and reformulation (Kwon et al. 2017; Ruffle 1999; Sherry 1983). It is argued that had this work developed a phone application to be downloaded to create or consume nostalgic hybrid gifts it may have disrupted the expected traditions within a gift exchange; **designing for existing rituals involves seamless, ambient, and thoughtful uses of technology to enhance the ritual, not change it entirely.**

Secondly, rituals can be socially complex and the studies in this thesis highlighted how relationships can be strengthened or affirmed via exchanges, concurring with extant gifting works (Sherry 1983; Blau 2017; Philp et al. 2016). On the other hand, a key lesson from researching the gifting ritual is to **understand the social complexities, dimensions, and circumstances** which are embedded within rituals and how they can potentially impact relationships. Researchers should be aware that innovation within social rituals can result in both positive and negative

impacts.

Thirdly, designers should consider remote vs collocated interactions when designing for ritual spaces. For example, this work has demonstrated how remote vs collocated gifting can alter experiences. When gifts are opened in a collocated environment, the giver may act as an instructor to explain the gift, perhaps removing some of the surprise or self efficacy from the recipient of interpreting the gift alone. Whereas remote gifting, when giver and recipient are not physically located together provides unique opportunities of promoting presence or finding other ways to give feedback on the gift like sharing a social media post or recording their reaction to asynchronously send to their giver. Designers should consider the nature of interactions in rituals and the effects this can have on experiences when they happen remotely or collocated.

In short, researchers should not aim to condense complex social situations into technical solutions, instead, technologies should be embedded to become part of everyday rituals which ultimately **balance tradition and evolution.**

8.3.2 Blended experiences and emotional possibilities

Blended physical and digital experiences can afford story-telling possibilities (O'Keefe et al. 2021), promote memorable user experiences (Koleva et al. 2020), and enhance the value of everyday things (Benford, Hazzard, and Xu 2015). This thesis offers a different contribution of blending physical and digital; emotional possibilities.

Firstly, to concur with Denegri-Knott, Jenkins, and S. Lindley (2020), researchers interested in designing blended spaces, experiences, or products should consider shifting focus away from physical vs digital comparative narratives and instead focus on the **possibilities of merging physical and digital**.

Secondly, researchers and gift producers could consider how to present and onboard people to hybrid products/experiences. For example, this thesis focused on the nostalgic framing of hybrid gifts and it's suggested that **guidance or theming is important for designing emotional blended products or experiences**.

On the other hand, despite the clear emotional appeal of hybrid gifts, participants noted the potential to aesthetically improve packaging and digital layers, thus the opportunity to craft polished blended experiences/products could contribute to increased physical and emotional appeal. Similarly, the type of technology to access digital layers could be considered, a QR code is just one example. Researchers could explore AR, RFID tags, or other technologies.

Thirdly, **layering different media types and a physical item increases emotional appeal which affords a vivid multi-sensory blended experience**. Researchers/producers should consider the emotive powers of **matching physical items with personal digital media** to present a compelling nostalgic narrative. Overall, when designing blended products or experiences to evoke emotions objects are best matched or related as opposed to presenting personal media with generic gifts (e.g. flowers or chocolate).

In brief, blending physical and digital objects opens up emotional possibilities and **those interested in this space should consider the aesthetic design, layering of media, and opportunities to match physical and digital objects to present emotional narratives.**

8.3.3 Designing with nostalgia

Firstly, whilst many studies have subtly and explicitly explored ways in which technologies can evoke, facilitate, and embed nostalgic emotions (Sungkajun and Seo 2019; Nilsson, Johansson, and Håkansson 2003; Lustig, Konrad, and Brubaker 2022), this thesis argues that **you cannot design to make all people feel nostalgic**. Nostalgia is a subjective set of personal emotions (Pascal, Sprott, and Muehling 2002; Merchant, LaTour, et al. 2013; Batcho 1995) and can vary from person to person. Having said that, **experiences can be designed with the intention they may evoke nostalgic feelings**. Thus, it's important to consider the overall user experience or customer touchpoints when framing a product, technology, or

experience and requires recognition that it's up to the individual to class something as nostalgic.

Secondly, feeling nostalgic is associated with negative impacts such as loss, loneliness, and regret (Wildschut, Sedikides, et al. 2006; Sierra and McQuitty 2007). A design implication uncovered throughout this thesis relates to designing with negative and bittersweet emotions. It's argued based on this thesis that negative associations of nostalgia should be made clear to participants/consumers. For example, throughout the four studies in this thesis, participants were always provided with a balanced definition of nostalgia; *"a feeling of pleasure and slight sadness at the same time as you think about things that happened in the past"* (Press 1995). On the other hand, nostalgia provides a unique opportunity to facilitate uncomfortable interactions which usually result in an overall positive psychological outcome (Benford, Greenhalgh, et al. 2012).

To summarise, there is no doubt designing with nostalgia can be challenging due to the personal, subjective, and bittersweet nature of nostalgic emotions. Whilst **there is no 'one-size-fits-all' approach to designing with nostalgia, prompts, themes, examples, and inspiration can be presented to guide and help participants craft their nostalgic narratives.**

8.4 Chapter Summary

This chapter first presented four main theoretical considerations and highlights key unique findings within each area:

1. Bittersweet nostalgia facilitated by hybrid gift exchanges
    - Defining what a nostalgic hybrid gift is.
    - How nostalgic emotions integrate within hybrid gift exchanges.
    - The impacts of nostalgia on hybrid gift exchanges.

2. Objects in hybrid gift exchanges
    - Hybrid gifting gives 'form' to a collection of media.
    - The role of physical products in hybrid gift exchanges.
    - Affordances of merging physical and digital in a hybrid exchange.
3. Technologies and hybrid gifts
    - The use of QR codes in hybrid gift exchanges.
    - Producer views on technologies for hybrid product design.
    - Communicating via technologies within hybrid gift exchanges.
4. Meaningful relationships
    - Motivation for gifting memories.
    - Roles involved within hybrid exchanges.
    - Impact of hybrid gifts on relationships.

Following the theoretical contributions the below three design considerations were set out for researchers, gift-producers, or those interested in the technology-mediated reflection space:

1. **Rituals and technologies:** Designing for existing rituals involves seamless, ambient, and thoughtful uses of technology to enhance the ritual.
2. **Blended experiences and emotional possibilities:** Layering different media types increases emotional appeal which affords a vivid multi-sensory blended experience.
3. **Designing with nostalgia:** There is no 'one-size-fits-all' approach to designing with nostalgia, prompts, themes, examples, and inspiration can be presented to guide or help participants craft their nostalgic narratives.

Chapter 9

Conclusion

This chapter summarises the thesis and is split into five main parts. The first part outlines a summary of the four research studies conducted within this thesis. Secondly, the key theoretical contributions are summarised along with the unique design implications based on this work. Thirdly, this section addresses the research questions set out at the beginning of this thesis. Fourthly, a limitations section highlights the drawbacks and circumstances surrounding the thesis. Lastly, the final part discusses what the future of hybrid gifting may look like and outlines potential areas for future exploration.

9.1 Summary

This thesis set out to uncover if and how nostalgia can be evoked within a hybrid gifting modality and the implications of this from gift-giver, recipient, and producer viewpoints. To recap, the four studies of this thesis are:

Firstly, the study of MeMa (chapter 4) outlined the design of a dedicated device to explore gift-giver perspectives on gifting digital memories. Through focus groups and interviews, the study uncovered how layering media and having a multi-dimensional gift presents a unique opportunity to craft new experiences. Moreover, the study uncovered motivations for gift-givers wanting to gift a memory like legacy, storytelling, or preservation. **The MeMa study was the basis for this thesis, it addressed a notable gap in gifting memories** and enabled a starting point to explore the concept of nostalgic memories in hybrid gift exchanges. Having said that, this study only involved gift-givers and it remained unclear how recipients would feel about receiving memories as gifts which led to the following chapter.

Secondly, the Nostalgic Gifting Study (chapter 5) set out to explore the exchange of nostalgic emotions via hybrid gifting modality. Pairs of gift-givers and recipients took part in the interview study, who created gifts containing a physical chocolate box and a digital personal nostalgic memory. The study uncovered the roles (media, giver, recipient, nostalgia, and hybridity) involved in a nostalgic hybrid gift exchange. Further, the study extended work on the stages of gifting by Kwon et al. (2017) by outlining how nostalgia impacts the five-stage gift exchange model. Finally, the study contributed new understanding by defining nostalgic hybrid gifts: ***a modality of gifting which enables the transfer of shared memories, relationships, gratitude, and a physical object which results in emotional bittersweet recall for both giver and receiver***. Whilst the nostalgic gifting study was the first in this thesis to facilitate exchanges between pairs of participants, there remained a gap in understanding the possibilities of nostalgic hybrid gifts and how the exchange may change when the physical product was not predetermined by

the researcher. Therefore, the following chapter aimed to build on this work whilst altering the exchange to extend the current understanding.

Thirdly, the Tailored Gifting Study (chapter 6) aimed to address types of physical gifts that could be paired with digital nostalgic memories whilst overall providing more freedom to the gift-giver. The study uncovered how and why different physical products can link with digital nostalgic memories and outlined in-depth the Preparation, Reveal, and Reflection stages. Despite this study and chapters 4 and 5 extending knowledge from gift-giver and recipient viewpoints, it remained unclear if and how this knowledge could translate commercially or what gift producers' opinions of nostalgic hybrid gifts were. Therefore, the following chapter aimed to address this gap.

Fourthly, the Gift Producer Study (chapter 7) brought together findings and knowledge from chapters 4, 5, and 6 to discuss concepts with gift producers. Through a focus group and participatory methods, gift producers were asked to ideate on the concept of nostalgic hybrid gifts. Findings from this study outline producers' key challenges and opportunities in designing hybrid gift products. The discussion highlighted design recommendations and considerations for producers or designers based on the focus group. For example, producers may consider how they guide recipients through the opening process and how they may use packaging or wrapping to help with this interaction.

Overall, the research conducted in this thesis fits into and extends previous knowledge on technology-mediated reflection, where many studies have developed and explored technologies to support reminiscence or remembering (Odom, Wakkary, et al. 2019; Chen et al. 2023; Kalnikaitė and Whittaker 2011; Odom and Pierce 2009). Having said that, **this thesis is unique in that it has leveraged the social ritual of gifting to explore new ways that technologies may support revisiting the past and feeling nostalgic**. Specifically, this thesis has addressed multiple gaps in research such as bringing together the areas of nostalgia and gift-

ing, engaging gift producers in academic research, ways that technology can support nostalgic emotions, how to blend physical and digital objects to craft nostalgic narratives, and ways in which growing digital archives can be repurposed to form part of a gift. The result of addressing these research gaps is the contributions of this work which are set out in the following section.

9.2 Contributions

This section highlights the unique contributions of this thesis. As set out in chapter 8, this research has uncovered new theoretical understanding and design implications within the hybrid gifting space. The contributions of this work are aimed at the fields of HCI and consumer research, specifically for those interested in the topics of gift-giving and technology-mediated reflection, which may be useful for researchers, designers, or gift producers. Moreover, this thesis is an example of leveraging a multidisciplinary approach to address multiple areas and topics.

Firstly, the theoretical contributions (as set out in chapter 8 section 8.2) outline how nostalgia, objects, technologies, and relationships are involved within hybrid gift exchanges and the key contributions are summarised below:

Bittersweet nostalgia facilitated by hybrid gift exchanges:

- This thesis has built upon existing definitions of gifts and hybrid gifts to contribute a new definition of a nostalgic hybrid gift: *"a giver-centric, multisensory modality of gifting which enables the transfer of shared memories, relationships, gratitude, and a physical object which can result in emotional, bittersweet, and nostalgic recall for both giver and receiver"*.
- This work highlights how nostalgic emotions can become part of a hybrid gift exchange e.g. how the giver leverages both physical and digital objects to craft a nostalgic narrative.
- Nostalgia can impact how the recipient views a gift and can impact the likeli-

hood of a gift being well received.

Objects in hybrid gift exchanges:

- This thesis extends discussions on providing physical form to digital objects, in this case, hybrid gifting gives form to a collection of otherwise unrelated media.
- This thesis extends knowledge on the importance of physical items in gift exchanges and uncovered how matching digital and physical objects creates one whole gift.
- This thesis contributes unique knowledge on the affordances of merging physical and digital which are: a memorable exchange, psychological benefits, ongoing connections, and multi-sensory presentation of gifts.

Technologies and hybrid gifts:

- This thesis has uncovered new knowledge about using QR codes on physical products and specifically ways of using technology to communicate via hybrid gift exchanges.
- This work contributes the unique perspective of the gift producer and their views including the technical challenges of creating hybrid products.

Meaningful relationships:

- This research has uncovered gift-giver motivations for wanting to gift nostalgic memories: legacy, storytelling, to promote conversations, preserving the past, and to reminder others of the past.
- This work extends discussions on roles involved within hybrid gift exchanges. For example, how the gift-producer must onboard gift-givers and educate recipients, the role of the gift-giver is to select nostalgic media and self-reflect. The role of the recipient is to interpret the objects and reflect on their relationships.

- This research has contributed new knowledge on how hybrid gifts impact relationships, such as how givers and recipients felt their relationship had been reaffirmed or strengthened and how vividness promotes closeness within relationships.

The above theoretical contributions feed into more practical design implications and considerations for researchers, gift-producers, or those interested in the technology-mediated reflection space:

Rituals and technologies: This implication goes beyond gifting and considers how to design within the ritual space and proposes seamless, ambient, and thoughtful uses of technology to enhance social rituals. Moreover, this consideration involves an awareness of both the positive and negative impacts that innovation within this space can have on relationships.

Blended experiences and emotional possibilities: This consideration involves shifting away from comparative digital vs physical narratives to instead focus on the possibilities of merging physical and digital objects. Further, this implication discussed how layering different media types whilst matching objects to a nostalgic narrative can increase emotional appeal, in turn affording a vivid multi-sensory blended experience.

Designing with nostalgia: A key focus of this thesis is nostalgic emotions. This implication discusses considerations for designers or researchers who are interested in designing with or for nostalgia. Key points include: there is no 'one-size-fits-all' approach to designing with nostalgia, prompts, themes, examples, and inspiration can be presented to guide or help participants craft their nostalgic narratives.

Overall, **the contributions of this work are unique in that they are from multiple perspectives of the gift-giver, recipient, and producer** and tells the whole story of nostalgic hybrid gifts. Additionally, for future studies, the methods used for recruiting and engaging with gift-givers, recipients, and producers could be useful. Thus, making the contributions of this work new and important for fields

that engage with gifting, social rituals, emotions, relationships, and technology. Finally, these contributions have helped to address the research questions which the following section outlines.

9.3 Answering the Research Questions

The overall aim of this thesis was to **uncover if and how nostalgia can be evoked within a hybrid gifting modality and the implications of this from gift-giver, recipient, and producer viewpoints**. The section will address the following three research questions set out at the beginning of this thesis:

What are the considerations for embedding or evoking nostalgia in a hybrid gift exchange?

All four studies have highlighted both rewards and challenges of embedding nostalgia within hybrid gift exchanges. Gift-givers in chapters 4, 5, and 6 all mentioned the time and effort involved in creating a nostalgic gift, especially in chapter 6 which highlighted the difficulty in matching physical and digital objects to craft a nostalgic narrative.

Further, findings align with previous work which highlights the subjective and personal nature of feeling nostalgic (Pascal, Sprott, and Muehling 2002; Merchant, LaTour, et al. 2013; Batcho 1995). Thus, **subjectivity is a key consideration along with the potential negative consequences of creating or consuming a nostalgic hybrid gift**. Participants in chapters 4, 5, and 6 mentioned feelings of sadness. For example, missing loved ones who had passed away or revisiting painful memories from the past which resulted in uncomfortable feelings. Having said that, this uncomfortable interaction relates to work by Benford, Greenhalgh, et al. (2012), who state that these interactions can ultimately result in a positive experience, as was the case with participants in the presented studies.

On the other hand, some positive considerations of embedding nostalgia within

hybrid exchanges relate to the impacts on relationships. Gifts can have multiple impacts on relationships (Sherry 1983), however, when nostalgia is embedded or evoked it mainly strengthens or affirms relationship meaning. Moreover, another notable consideration is how and when physical and digital objects are matched to present a nostalgic narrative it promotes a vivid and multi-sensory gift.

In brief, this thesis has highlighted several considerations of embedding or evoking nostalgia within hybrid gift exchanges which range from time, effort, negative emotions, subjectivity, vividness, and relational signalling, all of which ultimately varies from person to person.

What are the variations of nostalgic digital layers and does altering components like the type of media impact the experiences of gift-giver and recipient?

Based on this thesis, there are several variations of nostalgic digital layers. For example, throughout the four studies in this work media types have ranged from images, videos, text, and voice. The combination and layering of media creates a multi-sensory gift for the recipient. Having said that, there are different interactions with media that have not been explored in this thesis, for example, clicking on media to 'unwrap' more content.

Similarly, the hybrid gifts in this thesis used QR codes as the access technology to get to the digital layer. Participants mentioned throughout studies that a QR code has the drawback of being associated with marketing material but also how they aesthetically look on packaging. In some cases, a QR code may impact recipient experiences based on their preference. Alternatively, producers in chapter 7 mentioned other technologies like RFID tags or AR which may improve the user experience but could add unnecessary complexity to the gift.

The type of physical product can also impact the experience of gift-giver and recipient. For example, in chapter 5 givers had to select chocolate and some mentioned it was easy to create the gift. Whereas, in chapter 6 the giver got to select a physical

object of their choice and this time they stated the difficulty in knowing what to select. From a recipient's perspective, chocolates were viewed as bonus as opposed to when givers selected a physical gift of their choice which provided a multi-sensory and vivid hybrid gift. In brief, altering components involved within a hybrid gift like the physical product, access technology, or media may impact the experience of the gift-giver and recipient.

What are the roles and perspectives of the gift-giver, recipient, and producer within hybrid gift exchanges?

Based on extant literature and work conducted in this thesis, Figure 9.1 sets out some of the unique roles of gift producer, giver, and recipient.

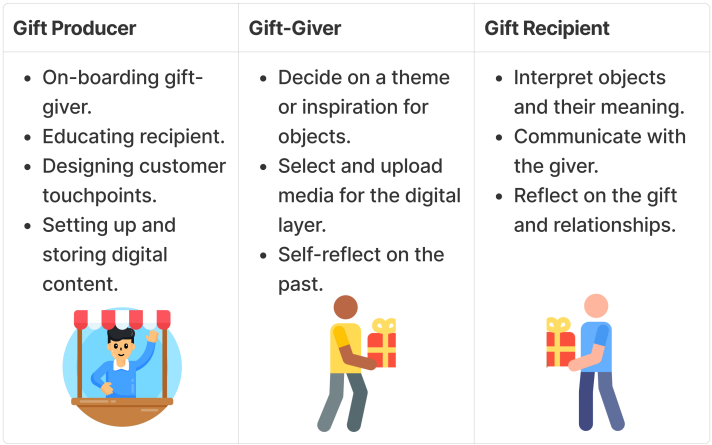


Figure 9.1: Roles of producer, giver, and recipient in hybrid gift exchanges

The giver, recipient, and producer each have their respective purpose and tasks within a nostalgic hybrid gift exchange. The producer has the task of explaining what a hybrid gift is and educating both the giver and recipient, whilst also facilitating the uploading, storing, and accessing of the digital content (chapter 7). The giver has to have an inspiration or theme for the gift (chapter 4), they are tasked with reflecting on the past and searching for media to represent their chosen narrative. Finally, the recipient deciphers the intended meaning behind physical and digital objects, they communicate with their giver and have an ongoing connection

to the exchange, objects, and their relationships.

9.4 Limitations

To reflect, this section will outline some circumstantial and practical areas that have impacted this thesis. Firstly, during the studies of MeMa (chapter 4) and the nostalgic gifting study (chapter 5), the Covid-19 pandemic resulted in strict lockdown restrictions within the UK. Whilst this meant access to resources and participants became more difficult, it also provided the opportunity for gift exchanges to take place in familiar and comfortable home environments of participants. Further, especially for the nostalgic gifting study (chapter 5), there were extra precautions put in place such as an in-depth screening form and time left between receiving and opening gifts to minimise any potential transmission of Covid-19. Due to careful planning of safety procedures, some elements of the study were overlooked, like the instruction sheet for recipients failed to mention that they could contact their gift-giver if they wish. Thus, when speaking to recipients in the interview they mentioned they didn't contact their giver because they were worried it would impact the study.

Another reflection is the multidisciplinary nature of this work and the time taken to understand literature and research-heavy topics like gifting and nostalgia. They are both topics that have many debates, arguments, and definitions and combining the two areas was challenging given my computing background. Having said that, the time invested in understanding these areas provided a useful foundation for exploring a new nostalgic gifting modality.

To reflect on the Tailored Gifting Study presented in chapter 6, the study aimed to explore the types of physical gifts selected by the gift-giver. It is recognised that the budget of £25 is a highly limiting factor of this study and perhaps having a larger budget would have yielded different findings. Having said that, the budget of £25 still enabled gift-givers some freedom to select a gift of their choice and feeds into arguments on affordability of the hybrid gifting modality.

A final limitation relates to the producer gifting study (7). Initially, 5 gift producers were recruited to take part in the focus group, however, 2 producers could not make it on the day and thus only 3 producers took part in the focus group. Whilst 3 producers seems like a small participant number, after speaking with producers and hearing about their businesses, processes, and workflows, 3 producers and their individual businesses were able to be discussed in-depth.

9.5 The Future of Hybrid Gifting

This chapter has outlined the four studies contained within this thesis and has summarised the unique contributions of the research. This final section highlights potential areas for future exploration which may serve as inspiration and a starting point for researchers, designers, or producers.

Innovation in the hybrid gifting space: Firstly, it's important to consider the changing landscape of gifts since beginning this research, for example, before starting this work four years ago the idea of merging physical products and digital content as a gift was mainly a concept in academia via the works of Kwon et al. (2017), Koleva et al. (2020), and Spence, Bedwell, et al. (2019). Since then, commercial examples of hybrid gifts or 'video gift messages' have emerged (Moonpig 2023; JoMalone 2023). Looking to the future, hybrid gifting is an area primed for further innovation in both commercial and academic environments. One example of this innovation has been presented throughout this thesis: digital personalisation via nostalgic emotions and media. Whilst nostalgia brings complexity and subjectivity to a hybrid gift exchange, it also presents unique opportunities to design slow, ambient, and emotional interactions in the gift-giving ritual. Researchers could explore other emotions or social interactions to enhance hybrid gift exchanges.

Affordable and sustainable nostalgic gifts: Another area for potential exploration is how hybrid gifting may promote a more affordable or sustainable modality of gifting. For example, nostalgic media can increase emotional value associated with

physical objects and bring meaning to less expensive gifts like chocolates. Moreover, instead of gift-givers purchasing more physical objects to *add value* to a gift, they could enhance the exchange via adding digital media, thus reducing the need for purchasing more items.

Nostalgic media and technologies: One aspect this work has highlighted is the sentimental value that people place on their nostalgic media and their desire to share nostalgic memories with others. In this work, nostalgic media was gifted via simple gifts containing a QR code. Perhaps in future, researchers or producers could explore different technologies to enhance the nostalgic experience/sentimentality by leveraging objects to create a more vivid or multi-sensory hybrid gift. Further, nostalgia applies outside the gifting ritual to other areas like sharing, letting-go, bereavement, Christmas, birthdays, and other ritual activities or cultural settings which may be interesting to augment with digital nostalgic memories.

Finally, perhaps hybrid gifting is a good middle ground for balancing tradition and technology in future. It's clear in some cultures and relationships tangible objects are highly important and are an expected part of the exchange, with purely digital formats of gifts lacking visible effort or sentiment. Maybe hybrid gifting is how we retain tradition and tangibility whilst also leveraging parts of our growing digital repositories in a meaningful way that is relevant to the virtual societies we live.

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Appendix A

The Memory Machine Appendices

A.1 The Memory Machine Consent Form

Consent Form for the Memory Machine

Will be converted to an online form – printed version will contain the same information with links to online form. Online form will contain information about how to get printed forms. Any questions with an asterisk will be required to be answered as YES for the participant to continue. If they answer NO, they will be screened to a message which explains how they can find out more information and how to withdraw (by exiting the browser)

These questions check that you are happy to consent to take part in the research project. We advise you complete this form in one sitting, it should take less than 5-10 minutes.

If you have any questions not answered by the information sheet or would like to complete this form in print, please contact Dr Elvira Perez at Elvira.Perez@nottingham.ac.uk (Tel.: [redeacted])

Please tick the appropriate boxes	**Yes**	**No**
Taking Part		
I have read and understood the project information sheet and the privacy document*	☐	☐
I have been given the opportunity to ask questions about the project *	☐	☐
I agree to take part in this project. Taking part in the project will include using a prototype platform/ device that will include uploading personal information to, which will be deleted at the end of the project. This project includes participating in two online group workshops, providing feedback, being video recorded and audio recorded, talking about and sharing personal memories (i.e., media files: photographs, music). I may also be invited to a follow-up interview*	☐	☐

Please tick the appropriate boxes	**Yes**	**No**
I understand that my taking part is voluntary; I can withdraw from the study at any time and I do not have to give any reasons for why I no longer want to take part*	☐	☐
I agree to being contacted in the future about this research	☐	☐

Use of the information I provide for this project only

I understand my personal details such as phone number and address will not be revealed to people outside the project*	☐	☐
I understand that my words may be quoted in publications, reports, web pages, and other research outputs. Note that some audio recordings will be sent to a third-party transcribing company*	☐	☐
I understand that data that **cannot** identify me may be published on web pages or in databases to support such research outputs*	☐	☐
I understand that when providing media files or contact information that include other people's details or portray other people, I need to provide consent from them too*	☐	☐

*Please choose **one** of the following two options :*

I am happy for personal media files or photos and audio recordings taken during the workshops that might identify me to be used in publications, reports, web pages, and other research outputs	☐	
I am **not** happy for personal media files, photos and audio recordings that might identify me to be used in the above	or ☐	

Use of the information I provide beyond this project

I agree for the data I provide to be archived at the University of Nottingham*	☐	☐
I understand that other authenticated researchers will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form*	☐	☐
	☐	☐

I understand that other authenticated researchers may use my words in publications, reports, web pages, and other research outputs, only if they

Please tick the appropriate boxes	**Yes**	**No**
agree to preserve the confidentiality of the information as requested in this form*		
So we can use the information you provide legally I grant the University of Nottingham a worldwide, non-exclusive, royalty-free, sub-licensable license to use, copy, distribute, display, excerpt and annotate any collected materials related to this project for which I hold the copyright (e.g. *only* for the purposes for which I have given consent)*	□	□

Typed full name taken as signature Date

_____ _____ _____

Project contact details for further information:
Dr Elvira Perez Vallejos,
Phone: [redacted]
Email: Elvira.perez@nottingham.ac.uk

A.2 The Memory Machine Information Sheet

Participant Information Sheet

Will be converted to an online form – printed version will contain the same information with links to online form. Online form will contain information about how to get printed forms

This is an information sheet which details what taking part in the MeMa research project will entail. This sheet is for older adults who would be using the main Memory Machine i.e. the hub.

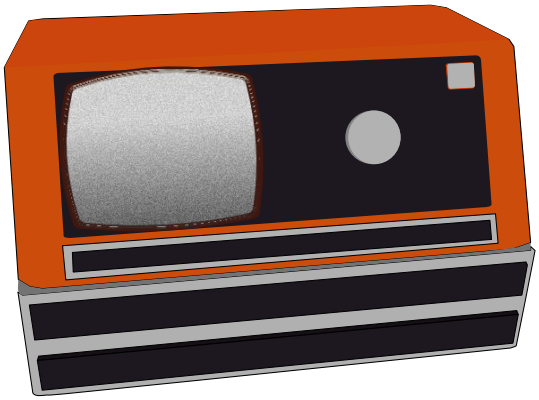
If you are someone who would be assisting in the use of the MeMa, please could view this form instead:

If you are someone who would be using the satellite version of the MeMa, such as a family or friend, please view this form instead:

We are looking for older adults who may be interested in using a digital device, which functions like an app. The digital device would be used to store memories and we are especially interested in whether this supports wellbeing for those with dementia. However, in these initial stages of development we want to ensure the device is user-friendly and your feedback will help to ensure this. You may use the device independently or with someone else who would assist you. In time, we hope to develop a satellite version of the device that your family and friends could use to interact with you on this device.

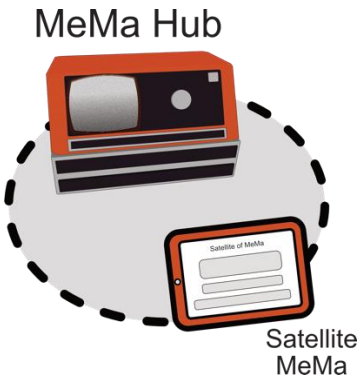
This research will include you being delivered a tablet, a manual for the MeMa and attending three 1.5 hour online workshops. You will also be invited to take part in a phone call later on in the research, lasting 30 minutes. You will be £60 reimbursed for your time.

What is the Memory Machine?



The Memory Machine (MeMa) is a working model, currently being developed at Horizon, University of Nottingham. Currently, it looks like a tablet (e.g. an iPad) with a camera on the front and back, a screen, speakers and microphone. In the future, we hope for it to look like the image to the right. This has and will continue to be designed to be easy to use and function.

The purpose of The Memory Machine will be to hold personal memories (e.g. pictures, videos, songs), which can be uploaded to the machine and displayed on or via the machine's screen or speakers. These memories can be blended with multimedia content (e.g. archive newspapers, photos, TV clippings) so that memories can become layered or informed by cultural history. The Memory Machine could offer an engaging tool for personal and family reflections, history education and for accessing cultural heritage. It could also offer an intervention for dementia care to improve the mental abilities and memory of someone with mild to moderate dementia.



We are also looking to develop a companion Memory Machine which would work in conjunction with the main Memory Machine. We can think of the main machine (pictured above) as the hub, and then a satellite version (pictured below) which could communicate with the hub. This would likely be used by your friends and family, to interact with the memories you have uploaded or to add memories that you may want on the hub.

What are the Memory Machine workshops about?

These workshops are being conducted by a multidisciplinary group of researchers at the University of Nottingham with developers and artists interested in developing new technologies for improving health and wellbeing, with a special focus on older people. The workshops will last for about 1.5 hours each.

The three workshops will aim to understand how users of the Memory Machine navigate it's features and feel about how the machine holds and stores personal memories. Questions and discussions in the workshop will

explore areas such as security and privacy, the types of media integrated into the machine, and how media is accessed. Tasks in the workshop will include observing how the Memory Machine is used, sorting features into preference order, imagining certain scenarios related to memories and how these would make you feel.

Workshops will take place on an online platform, and technical support will be provided for how to use and access the platform for the week prior to the workshop.

What are the follow-up phone calls about?

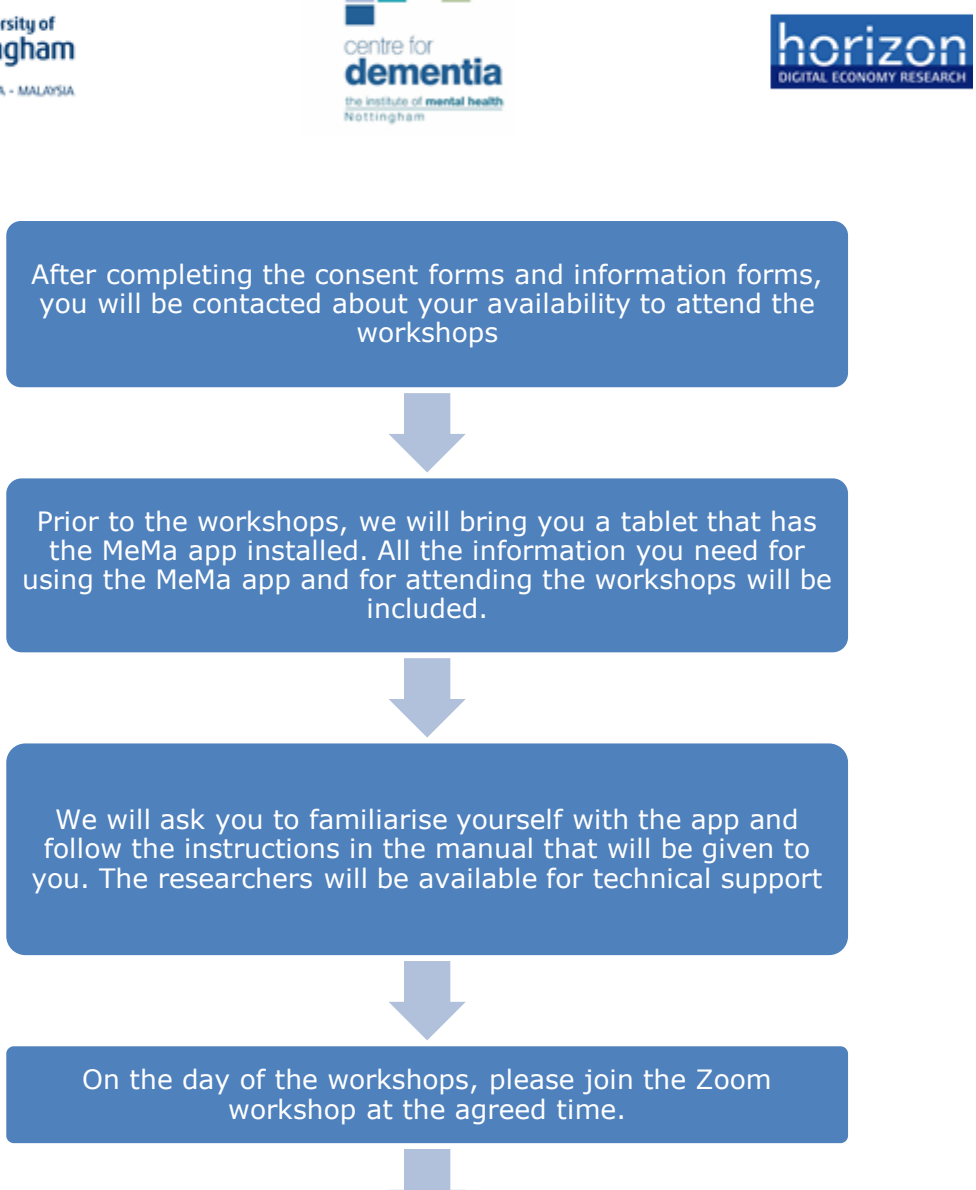
For those who take part in the workshops, a 30-minute follow-up phone call may be offered. This will be to explore how you feel the Memory Machine could support your wellbeing, memory loss and the idea of others accessing your memories. This will be conducted by a researcher with experience in these topics.

What can I expect when I take part in the workshop?

A week prior to the workshop, you will receive a contactless delivery of a study box containing the Memory Machine, a manual on using the machine and materials for the workshop such as paper and pens will also be provided. During that week, we would like you to start using the Memory Machine. You will also have an opportunity to get technical support for both the MeMa and for the online platform that the online workshop will be held on. This will be with a member of the research team and will be available through phone, email and via video call.

On the day of the workshops we will ask you to join the online platform using a personal device (e.g. a phone or tablet) with a front-facing camera and microphone, so that we can see and hear your thoughts on using the Memory Machine. At the workshop around four other older adults from the local area will also be present. If you intend to use the Memory Machine with someone assisting you e.g. a relative or carer, they will also be invited to attend the workshop.

The workshops will be highly interactive and will have lots of opportunity for discussion. There will be tasks, for example we may ask you to locate to a certain part of the machine, or we may ask you to talk about a memory that you would put on the machine. Such tasks may include talking about personal memories or bringing media files (e.g., pictures, videos, music) to the workshop about your life. Please note that if other people are included on your media files, you will need to ask for their consent. These forms will be sent to you in your study box.



Last updated 30th April

The dates and times of the workshop will be confirmed once contact details and information forms have been completed. Workshops will last 1.5 hours each. There will be breaks throughout.

We would like to keep you involved throughout the process of the research, so after the workshops, we will send you a report the findings and we will invite you to future research events relating to the project if you would like to hear more.

Everyone who takes part will be expected to respect the opinions of others, being courteous and considerate of each other. The workshop will begin by setting ground rules and we will discuss what to do if you feel uncomfortable at any point. If at any time during the proceedings you feel that you do not wish to continue, you will be free to leave.



Can I bring anyone to the workshop with me?

We recognise that some people may use technology at home but with the assistance of others, e.g. carers and relatives. We are also interested in hearing their thoughts about supporting those using the Memory Machine. Therefore, we welcome any such person to take part in the workshop with you. Please discuss with this person if they would be happy to take part in this research and workshop first, and if they are happy please a make a note of this on the information forms in the next pages of this survey. We will then contact them to ask them to complete the consent forms to take part.

If you have friends or family that you think would be interested in using the satellite version of the MeMa, please also speak with them before adding their contact details to the form. We will then contact them and ask them to take part in two separate workshops that will be similar to yours, but relate to the satellite machine.

What can I expect when I take part in the phone-call?

After the workshops have taken place, you will be given an opportunity to take part in a 30 minute phone call between you and a researcher who will have been in the workshop previously. This phone call will be to ask any follow-up questions that may have arisen from topics discussed in the workshops and to explore aspects of wellbeing in relation to the Memory

Machine. This will also give you an opportunity to relay anything you didn't feel able to or didn't have the time to talk about during the workshop.

What will I gain from taking part?

By taking part in this research, you will be contributing to how the Memory Machine functions and what features it includes, helping to ensure it is being designed with feedback from those who it would be aimed at being used by.

We also hope that you will have an enjoyable time, sharing ideas with other people and engaging in interactive activities.

Participation in the workshop is voluntary. We will give you online vouchers as an inconvenience allowance for your attendance to both workshops of £60 in total, and £10 for taking part in the phone interview.

Will data be taken? What will they be used for?

Personal data will be taken from the information forms and the audio and video recordings from the workshops. The data we collect from the Memory Machine will only be that shown to us by you during the workshop and your interaction logs with Memory Machine.

The media uploaded to the Memory Machine by yourself will only be available to you and those you show. After the workshops have been completed, we will ask you to delete the data you have added to the machine. We will provide instructions for how to delete your data in the study box.

Please see the privacy agreement for more information on how we handle your data.

Do I need to do anything in advance?

We will be providing you with the Memory Machine and the manual for how to use the machine a week ahead of the workshops. We hope that you will have an opportunity to use the machine during that week. If you are using the Memory Machine with assistance, this person may be able to support you in using the machine during that week.

Some of the tasks in the workshop will include talking about memories, you may have some artefacts that you would like to bring to the workshop, e.g. keepsakes, photos, newspaper articles. All of this will be communicated to you via a letter in the study box which will be delivered to you ahead of the workshops.

During that week, we will be available to offer technical support for using the machine and for accessing the online platform the workshop will take place on.

How do I use the online platform for the workshop?

The online platform for the workshop will be decided based on the group's responses to the information sheet. We will try to select the platform that is most preferable to those in the group.

During the week before the workshops, we will be available to offer you technical support on using the platform throughout the working day. We want to ensure you feel as comfortable as possible during the workshop, and are more than happy to spend whatever time is needed for you to become familiar with the platform prior to the workshops.

What if I want to ask any questions or if I feel I need to talk to someone after the workshop?

We advise that you provide a contact number of a family/friend to us (with consent from that person) if you think that the workshop could impact you negatively. This will allow us to contact your family/ friend for a follow-up.

Name of service	Contact details	What support they offfer
Alzheimer's Society	Dementia Connect support line 0333 150 3456 Alzheimer's Society website https://www.alzheimers.org.uk/ Dementia Talking Point – Online Forum https://forum.alzheimers.org.uk/	Alzheimer's Society is the UK's leading dementia charity. If you are worried about yourself or someone you know with dementia, they can give advice and a range of support on topics related to dementia.
The Samaritans	Phone: 116 123 Email: jo@samaritans.org.uk Website: samaritans.org	Open 24/7 Open day and night for anyone who is struggling to cope. Offering someone to listen without judgement.
SHOUT	Text SHOUT to 85258	Provide free, confidential support 24/7 via text for anyone in crisis.
GP	Contact your local GP or doctors surgery	Your GP can help you and signpost you to further soureces of support dependning on your circumstances.

		https://www.docready.org/can help you with talking to your doctor about mental health

If you have any questions or concerns, please don't hesitate to contact:

Dr Elvira Perez at Elvira.Perez@nottingham.ac.uk (Tel: [redacted])

A.3 The Memory Machine Demographics Form

Demographic Information Form

1. What is your full name?
2. What is your DOB?
3. What is your gender?
4. What is your address?
5. What is your email address (if you have one)?
6. What is your phone number (landline and mobile)?
    a. How do you prefer to be contacted?

7. Choose one option that best describes your ethnic group or background

    1. English/Welsh/Scottish/Northern Irish/British
    2. Irish
    3. Gypsy or Irish Traveller
    4. Any other White background, (please describe)
    5. White and Black Caribbean
    6. White and Black African
    7. White and Asian
    8. Any other Mixed/Multiple ethnic background, (please describe)
    9. Any other Asian background (please describe)
    10 Other (please describe)
    11. Prefer not to say

8. Which of the following options best describes how you think of yourself?
    1. Heterosexual or Straight
    2. Gay or Lesbian
    3. Bisexual
    4. Other

    5. Prefer not to say

9. What is your highest Level of Qualification
    1. Level 1 (e.g. Level 1 NVQ/ D, E, F, G GCSE)
    2. Level 2 (e.g. Level 2 NVQ/ A*, A, B, C GCSE)
    3. Level 3 (e.g. A Level, AS level, advanced apprenticeship)
    4. Level 4 (e.g. CertHE/ HNC/ higher appreniceship)
    5. Level 5 (e.g. DipHE/ foundation degree/ HND)
    6. Level 6 (e.g. BA hons/ BSc hons/ graduate diploma)
    7. Level 7 (e.g. Integrated masters degree/ PGCE/ MA/ MSc)
    8. Level 8 (e.g. PhD/ DPhil)

A.4 The Memory Machine Manual Example

Welcome to

the

Memory Machine

Instruction Manual



Table of Contents

Welcome to the project! Please use this manual to help you

Table of Contents	2
What is the Memory Machine?	4
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Add your Name	9
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Creating More Photo Memories	17
Photo Slide Show	19
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Important Notes	26
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WHAT IS THE MEMORY MACHINE?

The Memory Machine app (or MeMa for short) is an ambitious multidisciplinary research project that includes multiple researchers at the University of Nottingham. This research project aims to preserve memories and people's identities.

Our approach builds upon a growing trend toward the application of technology to assist older people that may start experiencing cognitive decline and poor memory.

The Memory Machine differs from existing products to aid memory in key respects. Firstly, memories are sourced entirely from the user and their family members, making it personal. This is in line with the well-documented finding that personalised activities promote positive affect more successfully than generic ones. Secondly, The Memory Machine draws upon the literature on the positive effects of simulated family presence, by enabling people with dementia access to recordings of video messages, images and sound files made and added by authorised family members and friends. Finally, The Memory Machine will be embedded in a rigorous process to map users' preferences regarding data control and access, privacy and consent, through the nomination of a next of kin and instructions for legacy.

MeMa aims to personalise memories by developing a device able to capture people's personal memories as

well as factual data to build identities and contextualise personal recollections. MeMa is more than a digital photo album. It places the user at the heart of the design process to ensure personal memories are contextualised into meaningful timelines that create a range of outcomes that can be assisted and shared with friends and family. These outcomes will include personalised digital souvenirs, digital repositories for the end-of-life, engaging tools for personal reflection, tools for accessing cultural heritage, and interventions for dementia care that enable reminiscence to improve the mental abilities and memory of people with mild to moderate dementia.

With digital footprints now beginning in the womb, our entire lives can be chronicled through our interaction, both explicitly and implicitly, with digital technologies. These digital footprints are becoming a keyway to access and revisit our memories and preserve identity. The Memory Machine project aims to explore how these technologies might interface between our real, subjective visceral and sensory experiences, and our perception of memory.

To make sure new technologies are more user friendly and engaging, your participation is very important. Please follow this Instruction Manual and make any notes and comments that could help us improve both the manual and the Memory Machine app. We will discuss your notes and feedback during the workshop sessions.

Hope you find the MeMa app fun and inspiring!

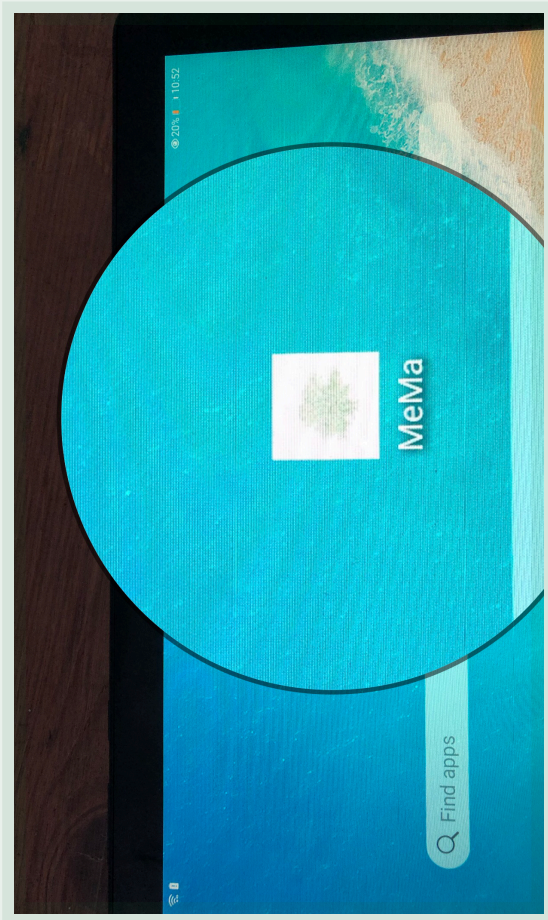
Thanks again for participating in this research study,

THE MEMA TEAM

Step 1

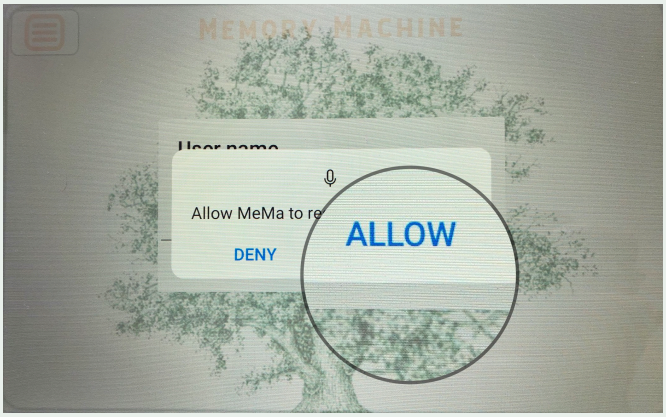


Step 2



Step 3





Starting the Memory Machine

In this section you will learn how to turn on the Memory Machine App and allow the Tablet to take pictures and voice messages

How to do it

Step 1: Switch on the tablet by clicking the right smaller button on the right top corner.

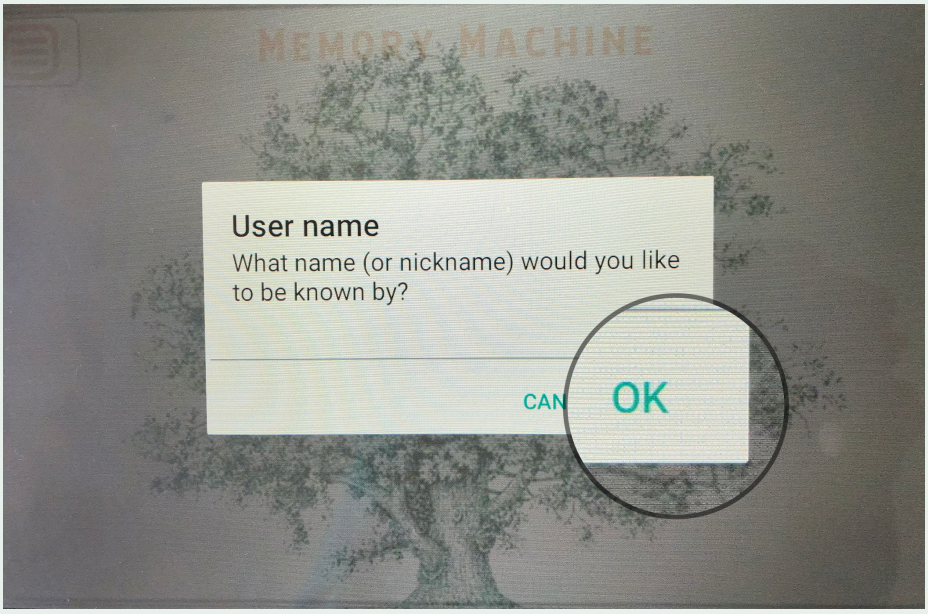
Step 2: Tap on the MeMa icon (white square with a green tree)

Step 3: Tap ALLOW so MeMa can access photos, media, and files to record audio.

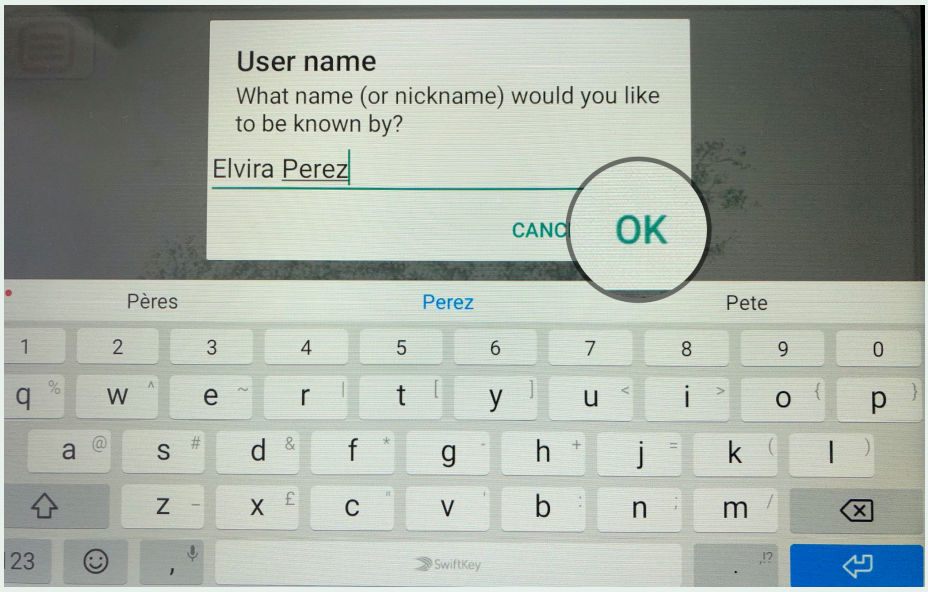
Congratulations

Your are all set up to use the Memory Machine

Step 4


MEMORY MACHINE
User name
What name (or nickname) would you like to be known by?
CAN
OK

Step 5


User name
What name (or nickname) would you like to be known by?
Elvira Perez
CANC
OK
Pères
Perez
Pete

Add your Name

Adding your name will personalise the experience of using the Memory Machine

How to do it

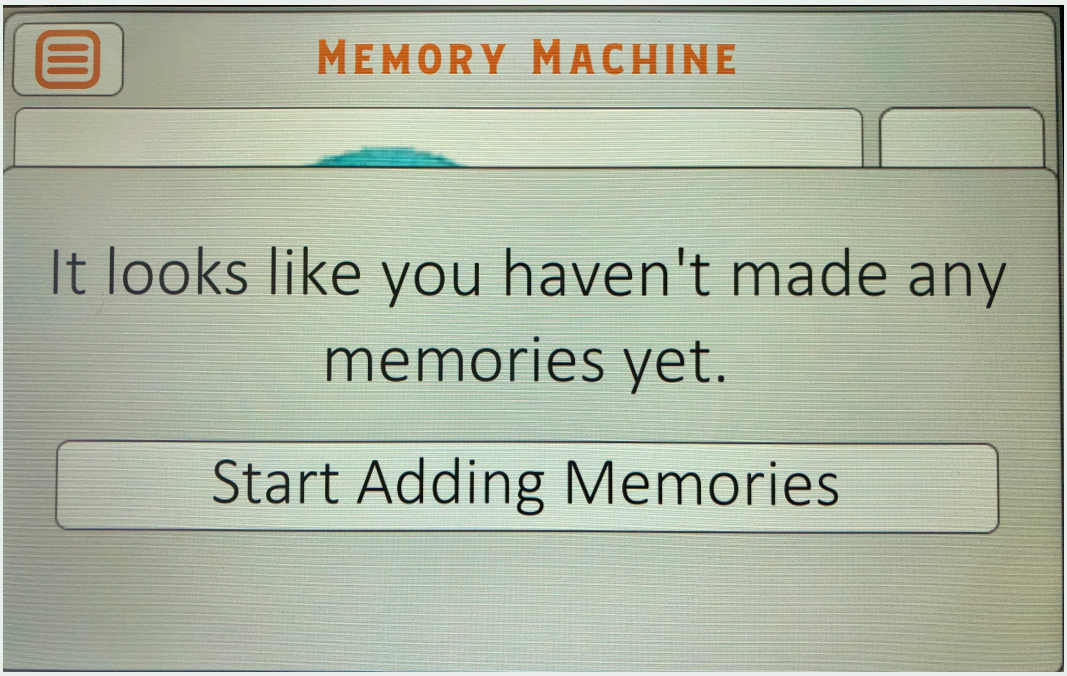
Step 4: When prompted with ‘What name would you like to be known? Tap ‘OK’

The keyboard will appear

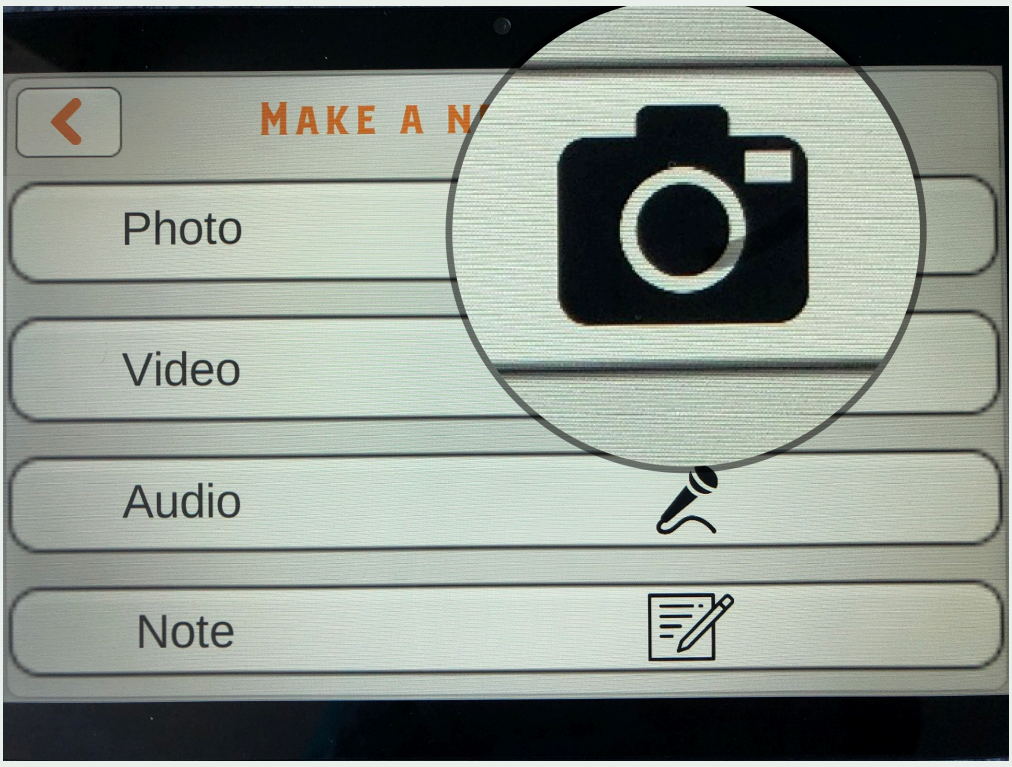
Step 5: Type your name or nickname and when finished tap ‘OK’

Write down your thoughts here:

Step 6


Memory Machine
It looks like you haven't made any memories yet.
Start Adding Memories

Step 7


Photo
Video
Audio
Note

Adding a Photo Memory

When you add a memory, you will get a choice of what type of memories to add. These may be Photo, Video, Audio (sing a song or add a voice note) or written Notes.

In the next sections we will tell you how to add each type of memory to the memory machine.

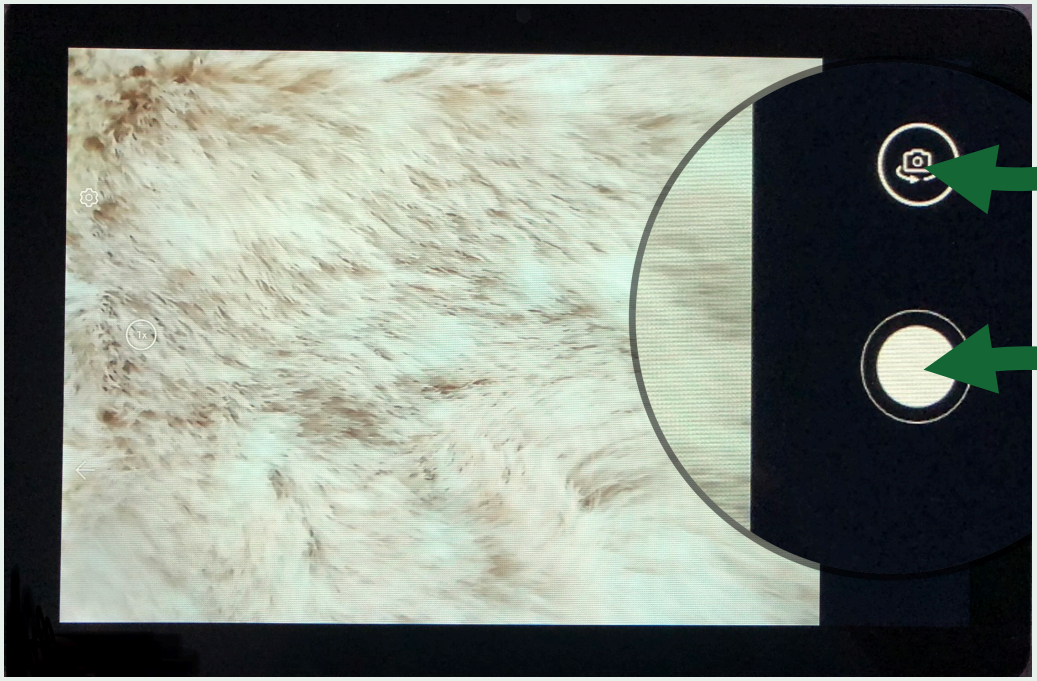
We will start by adding a photo memory.

How to do it

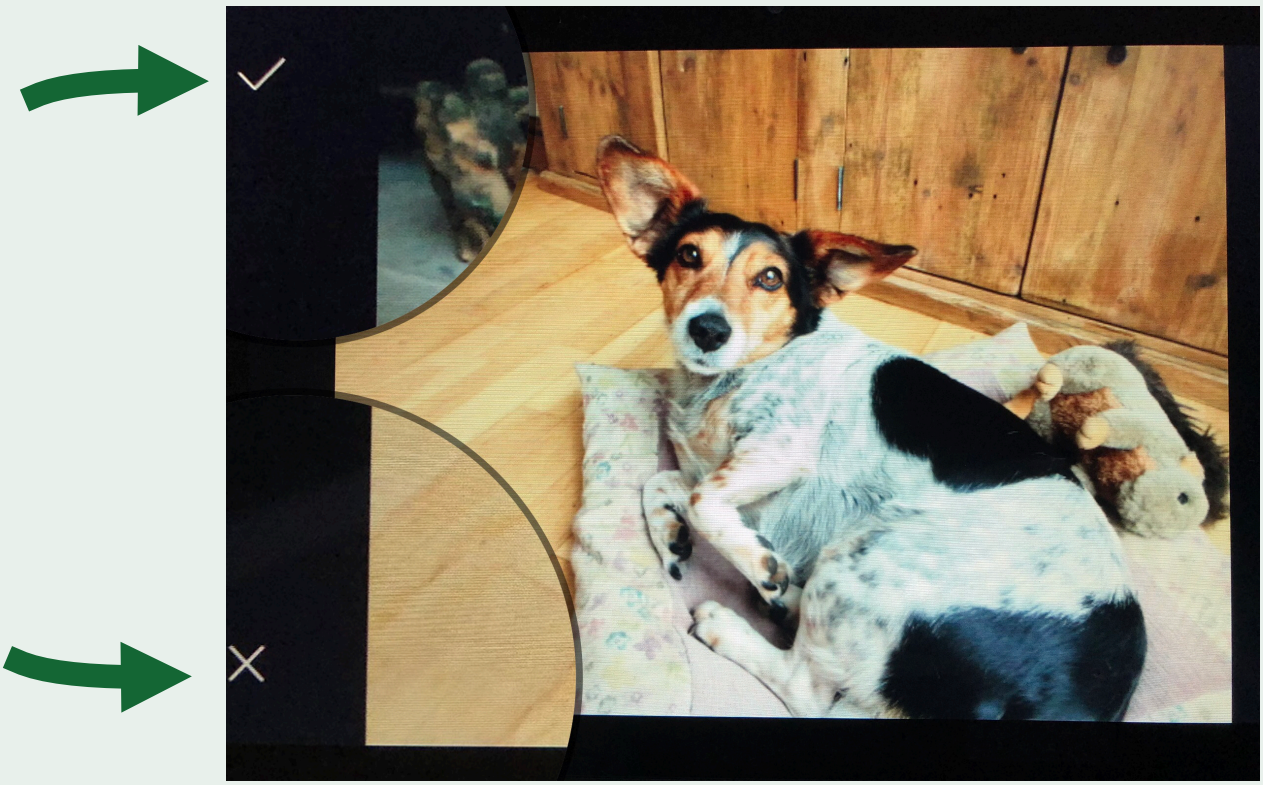
Step 6: The first time you use the MeMa app you will be prompted with the button 'Start Adding Memories'

Step 7: Tap on the Photo button.

Step 8



Step 9



Workshop 3

It's important memories are shared (and gifted) because they contain emotional value, and can promote a sense of belonging and togetherness. When you explain the circumstances memories can become a source for education and learning about a specific time in history.

Instructions: Please imagine you would like to share a memory (a gift describing your childhood to younger generations while providing context. What else was happening at that time? Any memorable music? Sports, news, politics, cultural event? Please feel free to add different media layers (e.g., music, voice recordings, additional photos or videos to that childhood memory to add context.

Think about the timeline. Do you prefer a specific chronological order? How would you organise the information?

hink about how you would like that memory to be shared? A slide show? An automatically generated video?

Your experiences and opinions are important to help us design a MeMa app that is sensitive to users' needs.

Frequently Asked Questions

How can I change the volume?

The long button on the top of the tablet is used to change the volume. Press the left side of the button to increase the volume. Press the right side of the button to lower the volume. When doing so, a little icon on the right side of the tablet will appear to show you the current volume levels.

What if I cannot get in the Memory Machine app?

This can have several reasons.

If the tablet screen is not switching on when you tap on it, you need to press the small button on the top of the tablet to wake it up. You then need to swipe up the screen with a finger.

The Memory Machine app is the icon with the tree on the screen. Tap on it to open the app.

Alternatively, it might be that the tablet is out of battery. Please see “What do I need to do if the tablet does not turn on?” below.

What do I need to do if the tablet does not turn on?

First try to press the smaller of the two buttons on top of the tablet for a longer time. If the tablet still does not turn out, it is likely that the tablet is out of battery and needs to be charged. To charge the tablet, plug in the included charger in the wider opening on the right-hand side of the tablet, then plug it into a convenient wall socket.

I'm in the app, but it does not react. The screen seems frozen.

First, try to switch the tablet screen off and on again, using the right button on top of the tablet. If this does not work, swipe up twice, by making to swiping gestures in succession. This should bring you back to the main tablet screen. Try to open the app from the main screen again.

Finally, if this does not work either, navigate to the main screen again. Put the tablet down on a stable surface and deliberately make a long swipe from the button of the tablet screen to the top. A little version of the Memory Machine display should appear. Press the 'rubbish bin' icon at the button of the screen. You should get back to the main screen. Open the app as usual from the main screen.

Notes to Self

Please use these sections to record any thoughts you have had whilst using the Memory Machine

A.5 The Memory Machine Focus Group Script

Date 2021

Workshop 3: Timeline and Gifting

Roles of the Facilitators

Lead facilitator:

- Facilitate the discussion

Support facilitator:

- Before the session:
  - Make sure that participants have signed in with their first name on the screen
  - Check the attendance
  - Record the session
- During the session:
  - In charge of the chat communications
  - Check timing
- After the session:
  - Give feedback to the lead facilitator on the participants' understanding, timing (rushed?)

Things for facilitators to remember...

- No judgements/values
- Rename/paraphrase/synthesise/summarise/repeat

Schedule

00:00 – 00:05	[1]	Wait for the participants, Check the attendance (first name), Camera on if they can
00:05 – 00:10	[2]	Functions of Zoom platform (mute/unmute, camera) …chitty chat
		Start recording
00:10 – 00:15	[3]	Start the session & talk about the consent/withdraw and if there are questions about the study
00:15 – 00:25	[4]	Introductions & Ice breaker question: Can memories become gifts?
00:25 – 00:30	[5]	Explain what Memory Machine is about with focus on gifting
00:30 – 00:35	[6]	Ask about the homework following instructions (did you have any difficulties?)
00:35 – 00:59	[7]	Participants present (5min each)
		BREAK
1:10 – 1:40	[8]	Ask questions: Focus group discussion
1:40 – 1:50	[9]	Closing questions. Explain what is happening next workshop
1:50-	[10]	Closure

Date 2021

00:00 – 00:05

[1] Before starting the session

- Check the attendance
- If participants have not signed in with their first name on the screen, ask them to rename it.
    - Click “Participants” at the bottom of the screen -> hover your mouse over your name in the “Participants” list on the right side of the Zoom window. Click on “Rename”.
- Encourage participants to turn on their camera to have more lively discussions if possible (but mention that it’s not a requirement if they don’t feel comfortable.)

00:05 – 00:10

[2] Functions in Zoom

- Make sure everyone can mute/unmute and turn cameras on/off
- Chitty chat

00:10 – 00:15

[3] Talk about the consent form and schedule

- Any questions about the consent form?
- You can withdraw at any time without any explanations.
- We will have a 10-minute break halfway through the session.
- At the end of the workshop, we will talk about the compensation.

00:015– 00:25

[4] Introduction & Ice breaker questions

- Start recording the session (*CLOUD RECORDING - Participants’ names can only be displayed in cloud recordings.) (I’ll explain to the audio transcriber that the names of the participants can be found here, but she needs to start transcribing after Ice Breaker
- First name (requested by the audio transcriber) & can memories be gifted?

00:25 – 00:30

[5] Explain what is MeMa and memories as gifts

[MEMA intro]

- There are no right/wrong answers.
- Confidentiality (All conversations will stay in this group).

Date 2021

00:30 – 00:35

[6] Any specific difficulty?

- Check difficulties/barriers/facilitators
- Did you need extra help or guidance beyond the Instruction manual?
- Check everyone is ready to present

00:35 – 00:59 (25 min = 5min/participant)

[7] Participants present their memories/gifts and describe the process of uploading the memory

- Tell us about your memory
- Why you choose that memory?
- How could you complement that memory? Does it trigger any other memories? What were you like at the time? What else was happening around the same time?

01:00 – 01:10

Break

01:10 – 01:40 (30min)

[8] Focus group/group discussion

Questions

- 1. Question to explore GIFTING (10min)
  - Can memories be a good gift? Which format?
  - When gifting a memory how would you hope to make a recipient feel?
  - Do you think a digital memory has the same sentimental meaning as a physical one? (e.g a digital photograph opposed to a physical one?)
  - Could nostalgia be evoked from gifting? If so by who (gift-giver or receiver)
  - Do you think gifting could shape how you would like to be remembered?
- 2. Question to explore TIMELINES (10min)
  - How would you organise memories? How go back to uploaded memories? How to evoke/trigger new memories?
  - Are timelines a good solution? Can you think of alternatives? Folders, Events, Themes/Topics
  - How well MeMa tell and share stories?
  - When playing back memories, do they look like you want them to look?
  - Do you need more help to better structure your memories/storytelling
- 3. Question to explore MEANING (10min)

- Do you think your memories would be of interest to other people? Who? What would they learn from your memories? How can memories teach others?
- Do cultural reference points (like songs or famous events or fashions) trigger particular memories? Would you want to add some external media to MeMa because it relates to your personal memories? What mass media can be incorporated (tunes, radio/TV/film clips, news reports, book extracts, fashion, food, products etc.)? How would you find things to include?
- Do you think MeMa is a good technical solution to capture personal memories, identity, legacy for afterlife, education, cultural heritage?

1:40 – 1:50

This is the last workshop. Instructions to recover the tablets and vouchers

1:55 – 2:00

[10] Closing comments

- Thank you for your participation.

Notes:

A.6 The Memory Machine Thematic Analysis Process

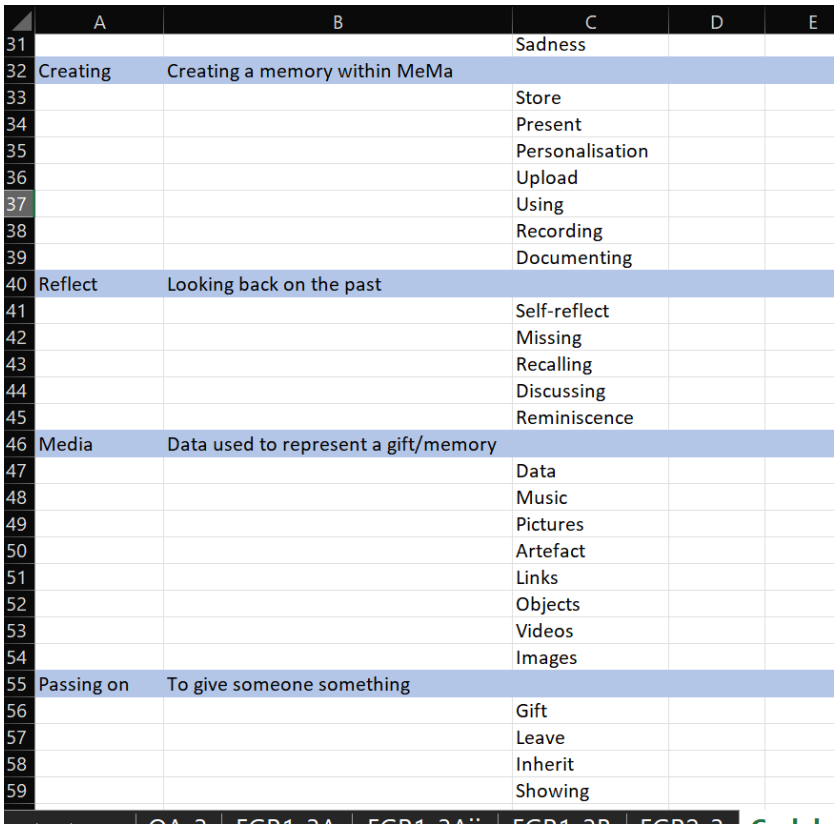
Initial coding examples

1. **Cleaned and anonymised transcript were coded to capture the essence of what was being said, each code was allocated an index number in order to trace back to the original source/participant.**

	A	B	C	D
1	**Interviewer**	**Participant Quote (ID=10)**	**Initial Code**	**Index**
2	Do you think that memories can become gifts?			
3		I think it's for, **if I get this kind of gift from my relatives or just close friends. I will be very happy to have or I will be happy to give them this as a gift as well, because you know we have just mugs with just images on it. Or just like the posters or just sharing the important moments**. Or like the personalised albums therefore it is very good idea to give them. For example, if you have a special events together with your friends or family members.	The idea of giving and receiving memories as a gift is a way to share and remember special events with family and friends.	FGR2_10_3
4		And **you can maybe just print I mean. Just use any online tools to help. Just personalise album and then maybe you can print them like the big albums and just may be used as a gift**, or just still gonna be maybe. I mean, yeah, I would be happy to have it.	Using digital tools can enable personalisation, such as creating photo albums online and printing a physical copy.	FGR2_10_4
5		A gift about it so yes so, I think it's actually key, **but if we are sharing, I mean if we are going abroad for trip and if I like a kind of getting ring key from the. Different cities or countries to just save them, to remember you visited this place kind of things yet. Therefore, I'm going to be happy to have it and happy to Give it as well.**		FGR2_10_5
		Key after the long day and you're just feeling tired but it's gonna be just good memory for you just if you touch it and say oh my God, visit these. **Places is all that and happy days kind of thing. But for the magnets is also good because you can see. I mean I'm always just using magnets. On my fridge or just around the kitchen, and therefore while. And I love. Cooking as I love. Cooking I can see it and I'm like a just. Maybe I can remember this day so far, because you know, after Covid because we have missed out on these keyrings**	Collecting physical mementos (key rings, fridge magnets) can be reminders of happy memories and improve wellbeing.	

	A	B	C	D
21	Next couple of questions is about the meaning of what memories mean, memories mean to us, the values attached to it? And what memories can do for us, sort of maybe, for others? Do you think your memories would be of interest to other people? And if so, who?			
22		**My children, hopefully, and hopefully, possibly their children if they decide to have children, and maybe even longer?**	Documented memories could be of interest to children and future generations of the family, a potential heirloom to pass down.	FGR13B_7_22
23		Yeah. Yeah, I think so. **So like the example that I gave about this earthquake, or any other life events that you feel like, really, really negative, but you always learn something positive from it. And you may be stressed out about something, probably big at the time, for them at the time, but it could be minor if you see a big picture and I guess if you're getting older, you get those life experiences from different events. And hopefully, because it's their mum talking about it, it's different from what you read in a book or what you, yeah, see in a movie.**	A memory of an earthquake was discussed and how this may help children to learn and provide a different perspective 'because it's their mum talking about it, it's different from what you read in a book'	FGR13B_7_23
		Yeah, I think so. Yeah, I like... I **think I mentioned my in-laws are doing it already. And that's, so that they can pass on their history to, to us, so I think it as a great idea, and I want them to see that too, for my, my parents and...culture [...]**	Discussed how in-laws are already documenting their memories to eventually pass on their history to them which will also	FGR13B_7_24

2. A codebook was used to keep track of naming conventions/interchangeable terms to help with initial grouping.



	A	B	C	D	E
31			Sadness		
32	Creating	Creating a memory within MeMa			
33			Store		
34			Present		
35			Personalisation		
36			Upload		
37			Using		
38			Recording		
39			Documenting		
40	Reflect	Looking back on the past			
41			Self-reflect		
42			Missing		
43			Recalling		
44			Discussing		
45			Reminiscence		
46	Media	Data used to represent a gift/memory			
47			Data		
48			Music		
49			Pictures		
50			Artefact		
51			Links		
52			Objects		
53			Videos		
54			Images		
55	Passing on	To give someone something			
56			Gift		
57			Leave		
58			Inherit		
59			Showing		

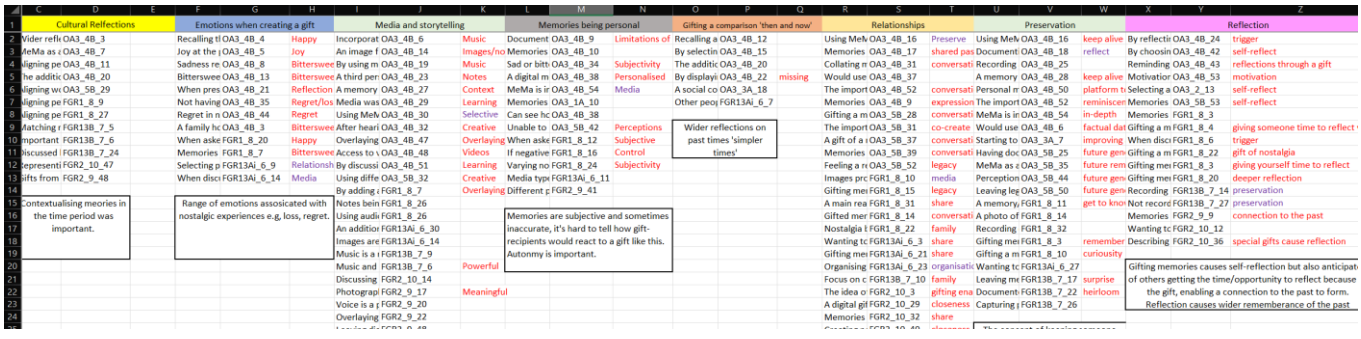
Initial Grouping process

1. Bringing all codes from all workshops together in one place (182 in total).



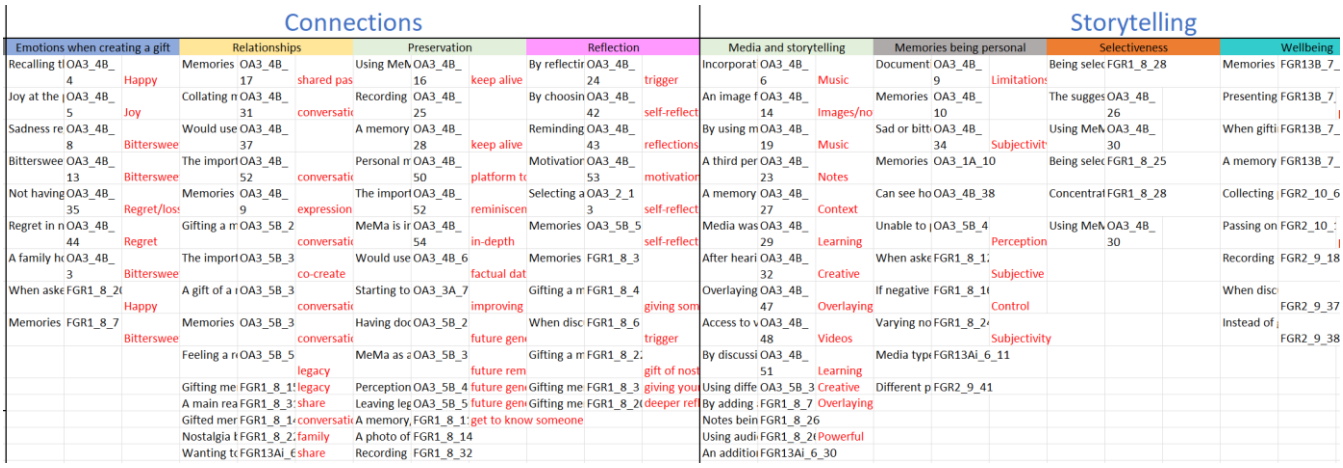
	A	B
1	**Code**	**Index**
2	Wider reflections on the past promoted by recalling popular culture at that time,	OA3_4B_3
3	Recalling the chosen memory to gift eliciting 'a true sense of happiness' - more th	OA3_4B_4
4	Joy at the prospect of passing on old family holiday memories to own children or	OA3_4B_5
5	Incorporating music into the memory helps to preserve a sense of the past	OA3_4B_6
6	MeMa as a factual record of what was happening in the world at a particular time	OA3_4B_7
7	Sadness regarding people who have passed away, but still recalling pleasant mem	OA3_4B_8
8	Documenting and remembering memories depends on an individuals ability and	OA3_4B_9
9	Memories change overtime to suit a narrative and tell a story.	OA3_4B_10
10	Aligning personal memories to world events at the time to paint a picture of the	OA3_4B_11
11	Recalling a memory to gift enabling a comparison between today and 'those days	OA3_4B_12
12	Bittersweet feelings elcited by recalling a particular memory to gift.	OA3_4B_13
13	An image from own childhood representing a memory alongside notes to tell the	OA3_4B_14
14	By selecting a childhood memory, reminiscence of that time and how it compares	OA3_4B_15
15	Using MeMa to select a memory to pass on to grandchildren to preserve the mem	OA3_4B_16
16	Memories with friends were selected as a gift as they were involved in the meme	OA3_4B_17
17	Documenting memories to share with others but also to self-reflect later in life.	OA3_4B_18
18	By using music to form part of a memory provided a sense of the past.	OA3_4B_19
19	The addition of popular culture and world events from previous years helped to p	OA3_4B_20
20	When presenting a social commentary, both factual historical media and persona	OA3_4B_21
21	By displaying a social commentary of previous years, reflective comparison took p	OA3_4B_22
22	A third person narrative was used to discuss childhood, resulting in comments on	OA3_4B_23
23	By reflecting on one memory to gift, you trigger a lot more memories to mind and	OA3_4B_24
24	Recording and documenting memories is important in order to facilitate future re	OA3_4B_25
25	The suggestion to use prompts to be selective with what memories go in to the M	OA3_4B_26
26	A memory of a Father presented using an image of family, the first man on the m	OA3_4B_27
27	A memory of someone's Father who passed away being gifted to their own childr	OA3_4B_28
28	Media was presented to provide insight into what a person was like e.g. 'my dad	OA3_4B_29
29	Using MeMa overtime may enable a narrative to form of what someone was/is lik	OA3_4B_30
30	Collating media for a memory from family members promoted conversations abo	OA3_4B_31
31	After hearing everyone's gifts they selected, a theme of creativity in each was ev	OA3_4B_32
32	Sad or bittersweet memories may not be received well as a gift but if there was a	OA3_4B_34
33	Not having documented memories of parents contributes to regret and loss, and	OA3_4B_35
34	Would use MeMa to gift someone the chance to deal with bittersweet memories	OA3_4B_37
35	A digital memory being a unique gift.	OA3_4B_38
36	Digital photographs of a memory enabling editing and zooming in, which you can	OA3_4B_39
37	Technology supporting the sharing of physical photo book gifts by making copies	OA3_4B_40
38	By choosing a memory to gift to someone the gift-giver gets a chance to self-relfe	OA3_4B_42
39	Reminding recipients of a shared past, MeMa gifts can represent relationships thi	OA3_4B_43
40	Regret in not having memories recorded from people who have passed away 'if o	OA3_4B_44
41	Organising memories in chronological order.	OA3_4B_46
42	Overlaying digital media to promote a compelling narrative 'some music of the ti	OA3_4B_47
43	Access to videos to document and enrich memories and provide a sense of the pa	OA3_4B_48
44	MeMa is an example of how we can use technology to ensure we can leave our m	OA3_4B_49
45	Personal memories and legacy are important features of MeMa because it is a pla	OA3_4B_50
46	By discussing other people's memories you can learn a lot about a person and fin	OA3_4B_51
47	The importance of legacy for now and later in life. For example discussing memo	OA3_4B_52
48	Motivation to document memories for children, because of limited memories frc	OA3_4B_53
49	MeMa is important to record and store personal memories but also could provide	OA3_4B_54
50	A family holiday was selected as a memory to gift because it had a feeling of hap	OA3_4B_3
51	Time and access to memories as a limitation of being able to pass on memories vi	OA3_4B_5

2. Grouping similar codes using the code book and broad areas.



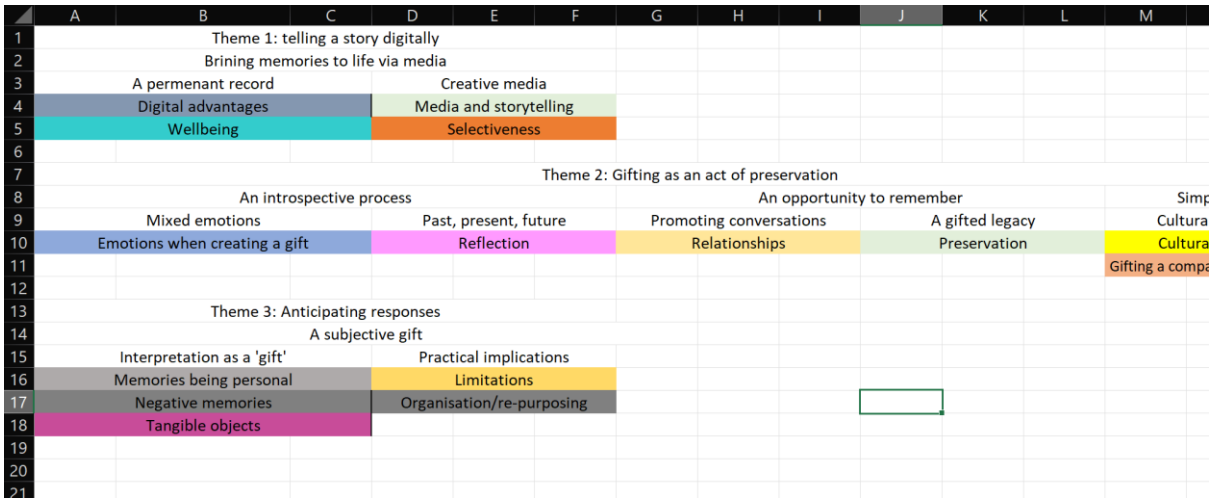
	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1		Cultural Relfections			Emotions when creating a gift			Media and storytelling			Memories being personal			Gifting a comparison 'then and now'			Relationships			Preservation					Reflection
2	Vider refl	OA3_4B_3		Recalling tl	OA3_4B_4	Happy	Incorporat	OA3_4B_6	Music	Document	OA3_4B_9	Limitations of	Recalling a	OA3_4B_12		Using MeM	OA3_4B_16	Preserve	Using MeM	OA3_4B_16	keep alive	By reflectir	OA3_4B_24	trigger
3	MeMa as a	OA3_4B_7		Joy at the p	OA3_4B_5	Joy	An image f	OA3_4B_14	Images/no	Memories	OA3_4B_10		By selectin	OA3_4B_15		Memories	OA3_4B_17	shared pas	Document	OA3_4B_18	reflect	By choosin	OA3_4B_42	self-reflect
4	Aligning pe	OA3_4B_11		Sadness re	OA3_4B_8	Bittersweet	By using m	OA3_4B_19	Music	Sad or bitt	OA3_4B_34	Subjectivity	The additic	OA3_4B_20		Collating m	OA3_4B_31	conversati	Recording	OA3_4B_25		Reminding	OA3_4B_43	reflections through a gift
5	The additic	OA3_4B_20		Bittersweet	OA3_4B_13	Bittersweet	A third per	OA3_4B_23	Notes	A digital m	OA3_4B_38	Personalised	By displayi	OA3_4B_22	missing	Would use	OA3_4B_37		A memory	OA3_4B_28	keep alive	Motivatior	OA3_4B_53	motivation
6	Aligning wi	OA3_5B_29		When pres	OA3_4B_21	Reflection	A memory	OA3_4B_27	Context	MeMa is ir	OA3_4B_54	Media	A social co	OA3_3A_18		The import	OA3_4B_52	conversati	Personal m	OA3_4B_50	platform t	Selecting a	OA3_2_13	self-reflect
7	Aligning pe	FGR1_8_9		Not having	OA3_4B_35	Regret/los	Media was	OA3_4B_29	Learning	Memories	OA3_1A_10		Other peo	FGR13Ai_6_7		Memories	OA3_4B_9	expression	The import	OA3_4B_52	reminiscen	Memories	OA3_5B_53	self-reflect
8	Aligning pe	FGR1_8_27		Regret in n	OA3_4B_44	Regret	Using MeM	OA3_4B_30	Selective	Can see hc	OA3_4B_38					Gifting a m	OA3_5B_28	conversati	MeMa is in	OA3_4B_54	in-depth	Memories	FGR1_8_3	
9	Matching r	FGR13B_7_5		A family hc	OA3_4B_3	Bittersweet	After heari	OA3_4B_32	Creative	Unable to	OA3_5B_42	Perceptions	Wider reflections on past times 'simpler times'			The import	OA3_5B_31	co-create	Would use	OA3_4B_6	factual dat	Gifting a m	FGR1_8_4	giving someone time to reflect
10	Important	FGR13B_7_6		When aske	FGR1_8_20	Happy	Overlaying	OA3_4B_47	Overlaying	When aske	FGR1_8_12	Subjective				A gift of a	OA3_5B_37	conversati	Starting to	OA3_3A_7	improving	When discı	FGR1_8_6	trigger
11	Discussed	FGR13B_7_24		Memories	FGR1_8_7	Bittersweet	Access to \	OA3_4B_48	Videos	If negative	FGR1_8_16	Control				Memories	OA3_5B_39	conversati	Having doc	OA3_5B_25	future gen	Gifting a m	FGR1_8_22	gift of nostalgia
12	Representi	FGR2_10_47		Selecting p	FGR13Ai_6_9	Relationsh	By discussi	OA3_4B_51	Learning	Varying no	FGR1_8_24	Subjectivity				Feeling a n	OA3_5B_52	legacy	MeMa as a	OA3_5B_35	future rem	Gifting mei	FGR1_8_3	giving yourself time to reflect
13	Gifts from	FGR2_9_48		When discı	FGR13Ai_6_14	Media	Using diffe	OA3_5B_32	Creative	Media type	FGR13Ai_6_11					Images pre	FGR1_8_10	media	Perception	OA3_5B_44	future gen	Gifting mei	FGR1_8_20	deeper reflection
14							By adding	FGR1_8_7	Overlaying	Different p	FGR2_9_41					Gifting mei	FGR1_8_15	legacy	Leaving leg	OA3_5B_50	future gen	Recording	FGR13B_7_14	preservation
15	Contextualising meories in the time period was important.			Range of emotions assosicated with nostalgic experiences e.g, loss, regret.			Notes bein	FGR1_8_26		Memories are subjective and sometimes inaccurate, it's hard to tell how gift-recipients would react to a gift like this. Autonmy is important.						A main rea	FGR1_8_31	share	A memory	FGR1_8_11	get to knor	Not record	FGR13B_7_27	preservation
16							Using audi	FGR1_8_26								Gifted mer	FGR1_8_14	conversati	A photo of	FGR1_8_14		Memories	FGR2_9_9	connection to the past
17							An additior	FGR13Ai_6_30								Nostalgia I	FGR1_8_22	family	Recording	FGR1_8_32		Wanting tc	FGR2_10_12	
18							Images are	FGR13Ai_6_14								Wanting tc	FGR13Ai_6_3	share	Gifting mei	FGR1_8_3	remember	Describing	FGR2_10_36	special gifts cause reflection
19							Music is a	FGR13B_7_9								Gifting mei	FGR13Ai_6_21	share	Gifting a m	FGR1_8_10	curiousity			
20							Music and	FGR13B_7_6	Powerful							Organising	FGR13Ai_6_23	organisatic	Wanting tc	FGR13Ai_6_27		Gifting memories causes self-reflection but also anticipat		
21							Discussing	FGR2_10_14								Focus on c	FGR13B_7_10	family	Leaving me	FGR13B_7_17	surprise	of others getting the time/opportunity to reflect because		
22							Photograpl	FGR2_9_17	Meaningful							The idea o	FGR2_10_3	gifting ena	Document	FGR13B_7_22	heirloom	the gift, enabling a connection to the past to form.		
23							Voice is a p	FGR2_9_20								A digital gi	FGR2_10_29	closeness	Capturing	FGR13B_7_26		Reflection causes wider rememberance of the past		
24							Overlaying	FGR2_9_22								Memories	FGR2_10_32	share						

3. Re-grouping initial groups



Connections								Storytelling							
Emotions when creating a gift			Relationships			Preservation			Reflection			Media and storytelling		Memories being personal			Selectiveness			Wellbeing	
Recalling t	OA3_4B_4	Happy	Memories	OA3_4B_17	shared pas	Using Mem	OA3_4B_16	keep alive	By reflectir	OA3_4B_24	trigger	Incorporat	OA3_4B_6	Music	Document	OA3_4B_9	Limitations	Being selec	FGR1_8_28		Memories	FGR13B_7_
Joy at the	OA3_4B_5	Joy	Collating n	OA3_4B_31	conversatic	Recording	OA3_4B_25		By choosin	OA3_4B_42	self-reflect	An image f	OA3_4B_14	Images/no	Memories	OA3_4B_10		The sugges	OA3_4B_26		Presenting	FGR13B_7_
Sadness re	OA3_4B_8	Bitterswee	Would use	OA3_4B_37		A memory	OA3_4B_28	keep alive	Reminding	OA3_4B_43	reflections	By using m	OA3_4B_19	Music	Sad or bitt	OA3_4B_34	Subjectivit	Using Mem	OA3_4B_30		When gifti	FGR13B_7_
Bitterswee	OA3_4B_13	Bitterswee	The import	OA3_4B_52	conversatic	Personal m	OA3_4B_50	platform to	Motivatior	OA3_4B_53	motivation	A third per	OA3_4B_23	Notes	Memories	OA3_1A_10		Being selec	FGR1_8_25		A memory	FGR13B_7_
Not having	OA3_4B_35	Regret/loss	Memories	OA3_4B_9	expression	The import	OA3_4B_52	reminiscen	Selecting a	OA3_2_13	self-reflect	A memory	OA3_4B_27	Context	Can see ho	OA3_4B_38		Concentrat	FGR1_8_28		Collecting	FGR2_10_6
Regret in n	OA3_4B_44	Regret	Gifting a m	OA3_5B_2	conversatic	MeMa is ir	OA3_4B_54	in-depth	Memories	OA3_5B_5	self-reflect	Media was	OA3_4B_29	Learning	Unable to	OA3_5B_4	Perception	Using Mem	OA3_4B_30		Passing on	FGR2_10_
A family h	OA3_4B_3	Bitterswee	The import	OA3_5B_3	co-create	Would use	OA3_4B_6	factual dat	Memories	FGR1_8_3		After heari	OA3_4B_32	Creative	When aske	FGR1_8_1	Subjective				Recording	FGR2_9_18
When aske	FGR1_8_2(	Happy	A gift of a r	OA3_5B_3	conversatic	Starting to	OA3_3A_7	improving	Gifting a m	FGR1_8_4	giving som	Overlaying	OA3_4B_47	Overlaying	If negative	FGR1_8_1(	Control				When disc	FGR2_9_37
Memories	FGR1_8_7	Bitterswee	Memories	OA3_5B_3	conversatic	Having doc	OA3_5B_2	future gen	When disc	FGR1_8_6	trigger	Access to v	OA3_4B_48	Videos	Varying no	FGR1_8_2	Subjectivity				Instead of	FGR2_9_38
			Feeling a r	OA3_5B_5	legacy	MeMa as a	OA3_5B_3	future rem	Gifting a m	FGR1_8_2	gift of nost	By discussi	OA3_4B_51	Learning	Media type	FGR13Ai_6_11						
			Gifting me	FGR1_8_1	legacy	Perception	OA3_5B_4	future gen	Gifting me	FGR1_8_3	giving your	Using diffe	OA3_5B_3	Creative	Different p	FGR2_9_41						
			A main rea	FGR1_8_3	share	Leaving leg	OA3_5B_5	future gen	Gifting me	FGR1_8_2(	deeper ref	By adding	FGR1_8_7	Overlaying								
			Gifted mer	FGR1_8_1	conversatic	A memory,	FGR1_8_1	get to know someone				Notes bein	FGR1_8_26									
			Nostalgia t	FGR1_8_2	family	A photo of	FGR1_8_14					Using audi	FGR1_8_2(	Powerful								
			Wanting to	FGR13Ai_6	share	Recording	FGR1_8_32					An additior	FGR13Ai_6_30									

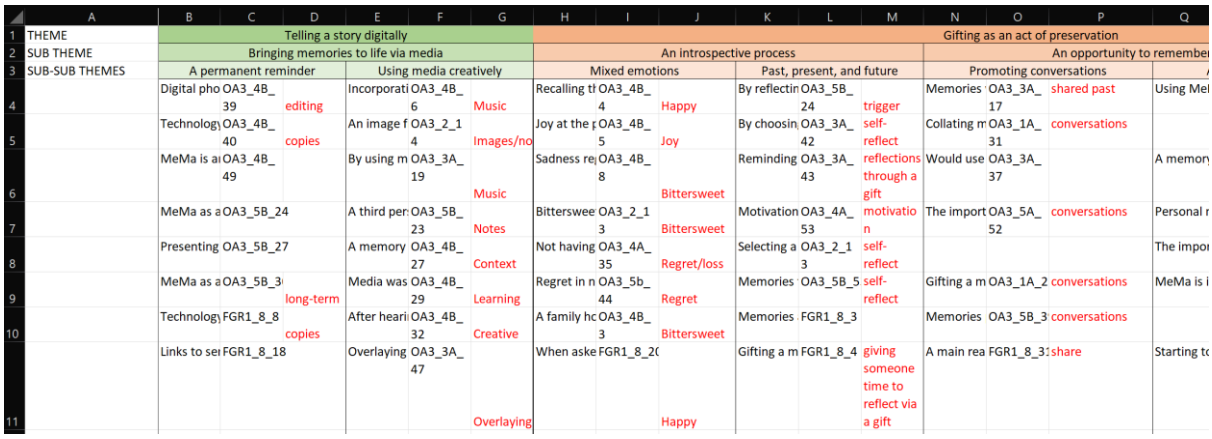
4. Grouping into potential themes



	A	B	C	D	E	F	G	H	I	J	K	L	M
1		Theme 1: telling a story digitally											
2		Brining memories to life via media											
3		A permenant record		Creative media									
4		Digital advantages		Media and storytelling									
5		Wellbeing		Selectiveness									
6													
7		Theme 2: Gifting as an act of preservation											
8		An introspective process					An opportunity to remember						Simp
9		Mixed emotions		Past, present, future			Promoting conversations			A gifted legacy			Cultura
10		Emotions when creating a gift		Reflection			Relationships			Preservation			Cultura
11													Gifting a compa
12													
13		Theme 3: Anticipating responses											
14		A subjective gift											
15		Interpretation as a 'gift'		Practical implications									
16		Memories being personal		Limitations									
17		Negative memories		Organisation/re-purposing									
18		Tangible objects											
19													
20													
21													

Generating themes

1. Initial theming



1	THEME	Telling a story digitally						Gifting as an act of preservation								
2	SUB THEME	Bringing memories to life via media						An introspective process						An opportunity to remember		
3	SUB-SUB THEMES	A permanent reminder			Using media creatively			Mixed emotions			Past, present, and future			Promoting conversations		
4		Digital pho	OA3_4B_39	editing	Incorporati	OA3_4B_6	Music	Recalling tl	OA3_4B_4	Happy	By reflectin	OA3_5B_24	trigger	Memories	OA3_3A_17	shared past
5		Technology	OA3_4B_40	copies	An image f	OA3_2_14	Images/no	Joy at the p	OA3_4B_5	Joy	By choosin	OA3_3A_42	self-reflect	Collating m	OA3_1A_31	conversations
6		MeMa is ai	OA3_4B_49		By using m	OA3_3A_19	Music	Sadness re	OA3_4B_8	Bittersweet	Reminding	OA3_3A_43	reflections through a gift	Would use	OA3_3A_37	
7		MeMa as a	OA3_5B_24		A third per	OA3_5B_23	Notes	Bittersweet	OA3_2_13	Bittersweet	Motivation	OA3_4A_53	motivation	The import	OA3_5A_52	conversations
8		Presenting	OA3_5B_27		A memory	OA3_4B_27	Context	Not having	OA3_4A_35	Regret/loss	Selecting a	OA3_2_13	self-reflect			
9		MeMa as a	OA3_5B_3	long-term	Media was	OA3_4B_29	Learning	Regret in n	OA3_5b_44	Regret	Memories	OA3_5B_5	self-reflect	Gifting a m	OA3_1A_2	conversations
10		Technology	FGR1_8_8	copies	After hearii	OA3_4B_32	Creative	A family hc	OA3_4B_3	Bittersweet	Memories	FGR1_8_3		Memories	OA3_5B_3	conversations
11		Links to se	FGR1_8_18		Overlaying	OA3_3A_47	Overlaying	When aske	FGR1_8_2(	Happy	Gifting a m	FGR1_8_4	giving someone time to reflect via a gift	A main rea	FGR1_8_3	share

2. Re-naming themes and organising quotes

	A	B	C	D	E	F	G	H	I	J
31		Simpler times'								
32		A cultural perspective			Alignment of personal memories to culture, hertiage, and notable e					
33	Context of old pop culture and comparison then and now/ heritage (4B, 3A, 10,9, 5B	I'll just rea	OA3_4B_3	It wasn't th	OA3_3A_22	[...] Some. I	FGR2_10_47	Could it wc	FGR2_9_48	in those da OA
34	Documenting memories can act as a factual record (3A, 7	[...] like we	OA3_3A_7	I think I m	FGR13B_7_24					
35	Aligning world events at the time to personal memories (2, 3A, 1A, 8,	Elvis Presle	OA3_2_11	the first m	OA3_3A_20	Was it just	OA3_1A_29	so I think it	FGR1_8_9	
36		Practicalities of gifting memories								
37		A subjective gift								
38		Interpretation as a 'gift'			Considerations of interpreting a subjective gift					
39	The accuracy of memories and openess of people depend (4B, 1A, 9	it also dep	OA3_4B_9	This whole	OA3_1A_10	So I think tl	FGR2_9_41			
40	Difficult to interpret sad memories as a gift (1A, 6, 8, 6,	So I think t	OA3_1A_34	And I guess	FGR13Ai_6_11	I don't why	FGR1_8_33	You know t	FGR13Ai_6	You know p FG
41	Subjectivity of recipients (1A, 3A, 8, 6,	[...] you car	OA3_1A_38	Yeah, it's b	OA3_3A_42	You don't I	FGR1_8_12	The viewer	FGR1_8_16	So second I FG
42	Tangible objects	it would be	FGR2_9_23	I always wa	FGR2_10_28	Parents or	FGR2_10_30	In the mai	FGR2_10_3	I mean bec FG
43		Practical implications			Practical implications of gifting a memory					
	Time and effort to	The memo	OA3_4B_5	I'm not sur	FGR2_10_35	You're not	FGR1_8_29	So, click an	FGR13B_7_20	

Appendix B

The Nostalgic Gifting Study Appendices

B.1 The Nostalgic Gifting Study Information Sheet

PROJECT INFORMATION



University of Nottingham
UK | CHINA | MALAYSIA

Date: 17/11/2020

Project: Using digital layers to evoke nostalgia in hybrid gifting

School of Computer Science Ethics Reference: CS-2020-R27

Purpose of the research.

This study aims to investigate if nostalgia can be evoked from a hybrid gift, this means a physical gift which involves a digital aspect. We aim to capture this experience by recruiting pairs of participants. Each pair will have a gift-giver and a gift-recipient. The gift-giver will create a gift using a website which will then be shipped to the recipient. We aim to explore if nostalgia can be evoked in this scenario and what are the benefits or barriers of this. We plan to interview the gift-giver once they have created their gift and then the recipient once they have opened their gift. We will not have any face-to-face interactions with participants, all of the interviews will be carried outline using a University-approved services such as Microsoft Teams. This study will work towards an exciting gifting paradigm which explores nostalgia, which may enable a truly personalised gifting experience.

Nature of participation.

Your participation is voluntary and in order to participate you (the participant) should read and sign a consent form. Once you have understood the nature of your participation and we have answered all your questions, if any, you will be able to participate.

Participant engagement.

Your participation involves all the following activities:

- Filling out an online screening form.
- Receiving, reading, signing and returning a consent form online.
- Receiving a gift at your home address (for gift-recipients).
- Participate in one online interview.
- Reflecting on your experience creating or receiving a gift.

Benefits and risks of the research.

Your participation will help us to understand the integration of nostalgia in a gift giving scenario. This understanding can contribute to the creation of prototypes and help us to identify opportunities to integrate nostalgic digital layers into a commercial environment. You will get to either create a hybrid gift for a friends/family or you will receive a gift from friends/family.

- There are no risks associated with participation beyond those typically associated with the consumption of chocolate. However, in the current situation we have special considerations due to COVID-19, these include:
- The researcher responsible of preparing the study kits will ensure that they feel and are healthy by going over a checklist of common COVID-19 symptoms and taking temperature readings the evening before and the day of packing. The researcher will thoroughly wash their hands before handling all materials and will wear a mask.
- We will show you the exact ingredients of the chocolate. We will ask you to confirm that you and the people living with you are not allergic to any of those ingredients. We will only include participants who are not allergic to the chocolate ingredients.
- We will exclude any household with someone who has an allergic reaction to the ingredients not just the participant of this study.
- We will exclude any household with anyone with COVID-19 symptoms.
- We will request you that when receiving the package at home you wash your hands immediately and leave the package to rest from 24 to 48 hours.
- We will not meet face to face for any reason

Use of your data.

Only the research team (academic supervisors and student) will be authorized to access the original raw collected data. Only the research team will have access to non-anonymised data, such as audio of the interviews. Only anonymized data and processed data (i.e. transcripts of interviews that do not contain any personally identifiable information) will be used to support a research paper/presentations/thesis. All the data will be stored on a secure digital repository provided by the University of Nottingham. We will use pseudonyms in the report and any other written document.

Personal data collected will be held in a secure and safe manner in accordance with the Data Protection Act 2018. However, no computer system is perfectly secure and it is always possible that a third party might gain unauthorised access to the collected data.

Future use of your data.

Your anonymised data may be archived and reused in future for purposes that are in the public interest, or for historical, scientific or statistical purposes.

Procedure for withdrawal from the research.

You can withdraw from the study at any time and you do not have to give reasons for why you no longer want to take part.

To withdraw during the study you will only need to inform the researcher of your decision using by sending an email, during the online meeting. If you decide to withdraw after your participation in the study you can express that decision by communicating with the researcher by using the email provided in the consent form. In both cases, you will not need to provide any reason for your decision. If you receive no response from the researcher, please contact the School of Computer Science's Ethics Committee.

You will have complete authorization to decide whether the researchers can keep your data in the case of your personal information and your data.

This research is being conducted by a researcher in the Horizon Centre for Doctoral Training. It has been reviewed and approved by the University of Nottingham, School of Computer Science Research Ethics Committee.

If you have questions please talk to a member of the research team, or after the event contact: Rebecca Gibson, School of Computer Science, The University of Nottingham, Jubilee Campus, Nottingham NG8 1BB; email: Rebecca.Gibson@nottingham.ac.uk

Contact details of the ethics committee.

If you wish to file a complaint or exercise your rights you can contact the Ethics Committee at the following address: cs-ethicsadmin@cs.nott.ac.uk

B.2 The Nostalgic Gifting Study Consent Form

CONSENT FORM

University of Nottingham
UK | CHINA | MALAYSIA

Date: 17th November 2020

Project: Using digital layers to evoke nostalgia in hybrid gifting

School of Computer Science Ethics Reference: CS-2020-R27

Funded by: Horizon Centre for Doctoral Training at the University of Nottingham

Please tick the appropriate boxes

	Yes	**No**
1. Taking part in the study		
a) I have read and understood the project information sheet dated 17/11/2020, or it has been read to me. I have been able to ask questions about the study and my questions have been answered satisfactorily.		
b) I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason		
c) I understand that taking part in the study requires me to upload a photograph of a past time/memory which can be seen by the researcher. **(If you are the gift-giver in your pair)** ***OR*** I understand that taking part in this study requires me to receive a gift in the post which may be a consumable product. **(if you are the gift recipient in your pair)**		
2. Use of my data in the study		
a) I understand that data which can identify me will not be shared beyond the research team (students and academic supervisors) of this study.		
b) I agree that anonymized and processed copies of my data (i.e. data that do not contain any personally identifiable information) may be used for the following purposes: – Publications and reports describing the project and its results – Thesis write up		
c) I give permission for my words to be quoted for the purposes described above,		

only after my identity has been protected by using a pseudonym.		
d) I give permission for my visual image contained in photos or video gathered during the research to be used for the purposes described above, only after my identity has been protected by blurring my face or not showing my face at all. I give permission for a written description of the photograph I upload.		

3. Reuse of my data

a) I give permission for the data (only after anonymization) that I provide to be reused for the sole purposes of future research, publications, presentations and learning.		
b) I understand and agree that this may involve depositing all my data in an authorized data repository. Only anonymised data will be available to other researchers (e.g. journal reviewer) at a reasonable request.		

4. Security of my data

a) I understand that safeguards will be put in place to protect my identity and my data during the duration of the study, and after if my data is stored for future use. The safeguards include storing all my raw data in a secure encrypted system with controlled access provided by the University of Nottingham.		
b) I confirm that a written copy of these safeguards has been given to me in the University's privacy notice, and that they have been described to me and are acceptable to me.		
c) I understand that no computer system is completely secure and that there is a risk that a third party could obtain a copy of my anonymised data.		

5. Copyright

a) I give permission for data gathered during this project to be used, copied, excerpted, annotated, displayed and distributed for the purposes to which I have consented.		

6. Signatures (sign as appropriate)

Name of participant (IN CAPITALS)	Signature	Date

If applicable:

For participants unable to sign their name, mark the box instead of signing ☐

I have witnessed the accurate reading of the consent form with the participant and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of witness (IN CAPITALS)	Signature	Date

I have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

Name of researcher (IN CAPITALS)	Signature	Date

7. Researcher's contact details

Rebecca Gibson

rebecca.gibson@nottingham.ac.uk

Provide the participant with a copy of the completed form either by email or hard copy as they prefer.

B.3 The Nostalgic Gifting Study Interview Plan and Scripts

Interview plan – Nostalgic Gifting Study

Intro

The purpose of this study is to determine if nostalgia can be evoked in a gift exchange. This study includes interviewing gift-givers and gift-recipients in order to determine if nostalgia has been evoked and if so, at what stages throughout the exchange. To begin planning the interview questions **two** main research questions were identified. Included within each question are sub-questions which helped to identify areas of literature to explore to formulate interview questions.

Research questions

RQ1. Did participants feel nostalgic?

(i) *How do we know this was nostalgia?*
(ii) *When did they feel nostalgic?*
(iii) *Why did they feel nostalgic? (any emotions e.g. loneliness?)*
(iv) *What made them feel nostalgic?*
(v) *Why didn't they feel nostalgic?*
(vi) *What did the nostalgia communicate if anything?*
(vii) *Why did participants select **that** photograph?*
(viii) *Did either party experience nostalgia greater than the other? E.g. the recipient or the gift-giver.*

RQ2. Was this classed as a gift exchange?

(i) What part of the experience felt like a gift?
(ii) Did participants class the digital content as a gift?
(iii) How do we know this was a gift?
(iv) How did participants feel when created / receiving the gift?
(v) Did participants reflect upon this gift? (if so what part)
(vi) Did this gift communicate anything?
(vii) Did nostalgia impact on the gift exchange?

Literature

The interview questions have been created based upon literature from the fields of HCI, psychology and business. The chosen literature focuses primarily on the areas of nostalgia and gifting as per the research questions.

As a starting point to formulate the interview questions, the five-stage gift exchange model shown in *figure 1* was explored in order to derive questions to ask participants about their gifting experience.

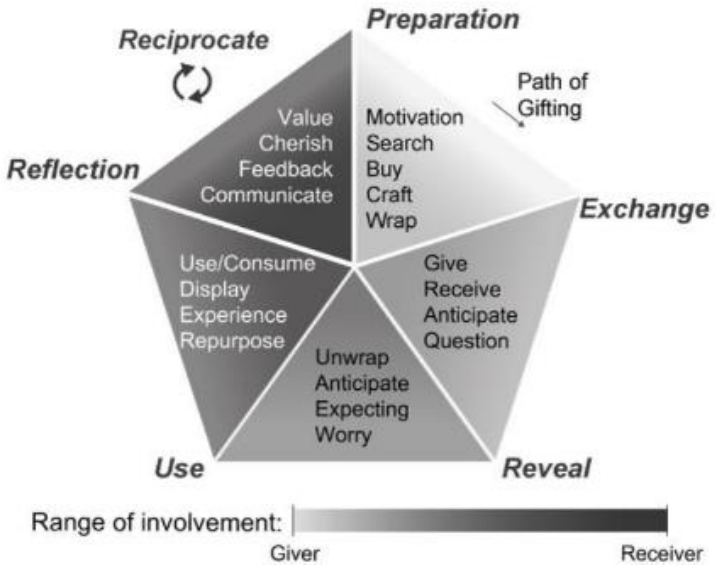


Figure 1*: Five-stage gift exchange model (Kwon et al., 2017, p.25).*

As stated in **RQ2** a key aspect of this study is the gift exchange and nostalgia, Kwon's et al (2017) model will be used to frame gifting questions explore if key components within an exchange were present. This is to validate that this experience was as close to an authentic gift giving scenario as possible and therefore enables the exploration of nostalgia within this context. Further reference was made to Galak et al, (2016) work which argues what should be involved in a gift from the gift-giver and gift recipients perspectives.

To address RQ1 '*Did participants feel nostalgic?*' literature related to nostalgia was explored, key work is highlighted in ***Table 1***. As per suggestions within the literature in order to measure nostalgia participants in most cases often have a definition of nostalgia presented to them. This will also be the case within this study (within the interview and on the gift creation webpage).

A further aspect exposed from reviewing nostalgia literature is to establish features of nostalgia from the participants, this may include asking participants to name three features of nostalgia. This could establish nostalgia proneness and likelihood of evoking this emotion within that participant. The aim is to then to have data which can be categorised into potential proneness and likelihood versus non-prone participants. Although this research is thematic in nature, it is evident from many nostalgia studies, proneness is key to exploring this topic and I believe will strengthen arguments for evoking nostalgia within a gifting scenario and will provide a more accurate representation.

Asking participants how the gift made them feel, then asking for further details e.g. if a participant receives a photograph of a past time with the gift-giver, asking the participant in more detail about the gift-giver to establish any nostalgic feelings which may be associated with an event/place/object/family/person which are already identified themes within consumer research and nostalgia (Holak and Havlena, 1992). This could be an indicator that nostalgia was experienced.

Wildschut, et al (2006) explored desirable and undesirable features of nostalgia. These features could be incorporated into the wording of the questions to establish if any of those features have been experienced. Similarly the 'Description and Properties of the Evoked Nostalgia Scale (NOST)' (Pascal et al., 2002) could be used within the language of questions to evaluate if nostalgia has been experienced within this exchange.

Literature	Key considerations
Routledge, et al (2012)	- Use a definition of nostalgia first - Social connectedness - Positive self-esteem - Provides a sense of life meaning - Increases positive mood
Holak and Havlena (1992)	- Common themes and subjects for nostalgic reflection. - Family, home, other persons (educational classmates, friends, co-workers, ex-spouse) , objects, events (birthdays, holidays, reunions), childhood, adolescence, sights, smells, tastes.
Wildschut, et al (2006)	- **Desirable features of nostalgia** - Positive affect (being really happy) - Social bonds (feeling loved) - Self-regard (high self-esteem) - Positive memories (remember fun times) - Growth (helps develop the person I am) - **Undesirable features of nostalgia** - Negative affect (sadness) - Loneliness (Makes me feel alone) - Loss (Feel loss) - Rumination (Think of the past too much) - Regret (Reminds me of things I regret)
Pascal, et al (2002)	- Description and Properties of the Evoked Nostalgia Scale (NOST) - Reminds me of the past. - Helps me recall pleasant memories. - Makes me feel nostalgic. - Makes me reminisce about a previous time.

	- Makes me think about when I was younger. - Evokes fond memories. - Is a pleasant reminder of the past. - Brings back memories of good times from the past. - Reminds me of the good old days. - Reminds me of good times in the past

Table 1 - Literature and key considerations

Gift-giver interview questions

Gifting

1. How did you find creating the gift?
2. What was your motivation (if any) to give a gift?
3. How long would you say you spent creating the gift?
4. What type of photograph did you attach? And why? E.g. event / place.
5. Were you trying to achieve anything by attaching that particular photograph?
6. Did you anticipate your recipient's reaction? If so of the chocolate or the photograph or both?
7. Is there any message you were trying to covey to your recipient? Do you feel you were able to do this?
8. Did your recipient contact you after they had received the gift?
9. Did they give you any feedback on the gift?
10. Did you add on a message with your gift? why or why not?
11. Did the gift prompt any dialogue between you and the recipient?

Explanation: To validate the gifting element of this study.

Nostalgia

Read the following to participant: Cambridge dictionary defines nostalgia as "a feeling of pleasure and sometimes slight sadness at the same time as you think about things that happened in the past:"
Maybe read after the first questions as to not influence answers to Q1?

1. If you had to describe nostalgia in three words what would they be?
2. When selecting the photograph for your gift did you reflect on the past at all? If yes what did you reflect on? People/places/objects/events?
3. Would you say you often experience nostalgia?
4. Did you experience any emotions or feelings when looking at the photograph you selected?
5. Did selecting a photograph for this gift make you reminisce at all? If so why?
6. Did you have any hopes to make your recipient feel a particular way when they opened the gift?
7. Did you experience any negative emotions throughout this experience? if so what emotion and why?
8. Did you reflect on the physical gift? if so at what point? Consumption / when opening? After?
9. Did you reflect on the digital component of this gift? if yes at which point?
10. Do you think the photograph added anything additional to the gifting experience?
11. Do you think the photograph helped to communicate anything to the recipient?
12. Did you experience any positive emotions when creating this gift? if yes what were they?
13. Were there any points throughout this process you felt nostalgic? At which points if yes? If no why do they think they didn't?

Explanation: Questions here are to explore proneness of nostalgia, explore emotions evoked and why (this will be compared with the literature themes and key nostalgic terms)

Experience and technology

1. Did you understand roughly what the finished gift would include? If no , what could be made clearer?
2. For this gift you got to select a photograph is there any other media type you would have liked to add? and why?
3. The photograph you selected was attached to a QR code, how did you feel about that?
4. What do you think of using other technologies within gifting e.g. a button you could press on the gift to display digital content?
5. In future would you like to experience receiving a hybrid gift like the one you created? Yes/no why?
6. *Do you have anything else to comment or add?*

Explanation: To inform future developments, to gain insight into gift-giver understanding of the hybrid exchange.

Gift-recipient questions

Gifting

1. How did you feel when you received the gift?
2. Did you contact your gift-giver after opening the gift? if yes why?
3. Did you enjoy the gift?
4. Did the digital content feel like a gift?
5. Is there a part of the gift you were most excited about?
6. Did you feel like the gift communicated anything to you from the gift-giver?
7. If you were to give something back to the gift-giver would it be related to the gift they sent you?
8. Did you feel like this gift reflected you or your gift-giver in any way?
9. Did the gift symbolise anything to you?

Explanation: To validate the gifting element of this study.

Nostalgia

Read the following to participant: Cambridge dictionary defines nostalgia as "a feeling of pleasure and sometimes slight sadness at the same time as you think about things that happened in the past:"
Maybe read after the first questions as to not influence answers to Q1?

1. If you had to describe nostalgia in three words what would they be?
2. Describe the photograph that was attached.
3. Did you feel any emotions when opening the gift? if so what emotions?
4. Would you say you often experience nostalgia?
5. Did you feel any negative emotions at any point? If so what emotion and why?
6. Do you think the photograph added anything additional to the receiving of this gift?
7. Did you recall any memories due to receiving this gift? if so what type of memory?
8. Did the gift make you feel connected to the recipient in any way?
9. Did you experience any positive emotions from receiving this gift? if yes what emotions?
10. Did you reflect on the past at all during this gift exchange? If so reflection on what? People/objects/places/events.
11. Were there any points throughout this process you felt nostalgic?

Explanation: Questions here are to explore proneness of nostalgia, explore emotions evoked and why (this will be compared with the literature themes and key nostalgic terms)

Experience and technology

1. How did you find scanning the QR ode?
2. Were instructions clear and easy to follow?
3. What thoughts do you have on different technology to display the digital content you received? E.g. a button on the physical gift which you could press to display the content?
4. Would you like to send a hybrid gift to someone? If yes would evoking emotion in the recipient be a consideration?
5. Is there anything additional you would like to add?

Explanation: To inform future developments, to gain insight into gift-giver understanding of the hybrid exchange.

References

Gifting

Galak, J., Givi,J. and Williams, E. (2016) 'Why Certain Gifts Are Great to Give but Not to Get: A Framework for Understanding Errors in Gift Giving', *Current Directions in Psychological Science,* 25(6), pp. 380-385.

Kwon, H., Koleva, B., Schadelbach, H and Benford S. (2017) '"It's Not Yet A Gift": Understanding Digital Gifting', *20th ACM Conference on Computer-Supported Cooperative Work and Social Computing.*

Nostalgia

Holak, S. and Havlena, W. (1992) 'Nostalgia: an Exploratory Study of Themes and Emotions in the Nostalgic Experience', *Advances in Consumer Research ,* 19(), pp. 380-387.

Pascal, V., Sprott, D. and Muehling, D. (2002) 'The Influence of Evoked Nostalgia on Consumers' Responses to Advertising: An Exploratory Study', *Journal of Current Issues & Research in Advertising,* 24(1), pp. 39-47.

Routledge, C., Wildschut, T., Sedikides, C., Juhl, J. and Arndt, J. (2012) 'The power of the past: Nostalgia as a meaningmaking resource', *Memory,* 20(5), pp. 452-460.

Wildschut, T., Sedikides, C., Arndt, J. and Routledge, C. (2006) 'Nostalgia: Content, Triggers, Functions', *Journal of Personality and Social Psychology,* 91(5), pp. 975-993.

B.4 The Nostalgic Gifting Study Thematic Analysis Process

1. Initial code examples

Givers Initial coding:

Missing others	1A,
Shared memories or past	1A,
Anticipation over digital	1A,
Excitement over digital	1A,
Discussing gifts/image with people external to exchange	1A,
Wanted to recreate past events	1A,
Own reflections on family/occasions/friends/places	1A,
The digital making the chocolates more meaningful, a thoughtful gift.	1A,
Unsure of how the image would be presented	1A
A targeted gift – not for certain people	1A,
Sharing the selected photograph with other family members e.g on group chat	1A,
Emotional feedback about the gift / Feedback on digital	2A,
Reaffirming relationship meaning and what recipient means to them / representing identities	2A,
Technology supporting personalisation	2A,
Not that excited about the chocolates being opened.	3A
Hybrid model is important / Chocolate was important	3A,
A more interactive gift involving senses e.g.	3A

Recipients initial coding:

Importance of hybrid	1B
Excited by the digital	1B
Bittersweet/ sadness	1B
Wanting to recreate similar memories again / longing for the past	1B
Digital brought meaning to the physical – adding 'richness' to the gift	1B
Anticipation of what the gift would be	1B
Reflection on occasions/family/friends/places/ the self	1B
More media types would personalise the gift further	1B
Chocolates being a nice addition to the digital (A bonus)	1B
Missing others	2B
Reflecting on giver	2B
Reaffirming relationship meaning with giver	2B
Visible effort and thought	2B
Not a suitable gift for everyone	2B
Wanting to give others a similar experience, e.g. embedding nostalgia in future gifts	2B
Showing / sharing or discussing the gift with people external to the exchange	2B
Forming a connection with others when apart	3B
Chocolate triggering a memory	4B
Keeping the gift tag	4B
A nice surprise	5B
Appreciation of the gift	2B

2. Grouping examples

1. Preparing a nostalgic digital layer.

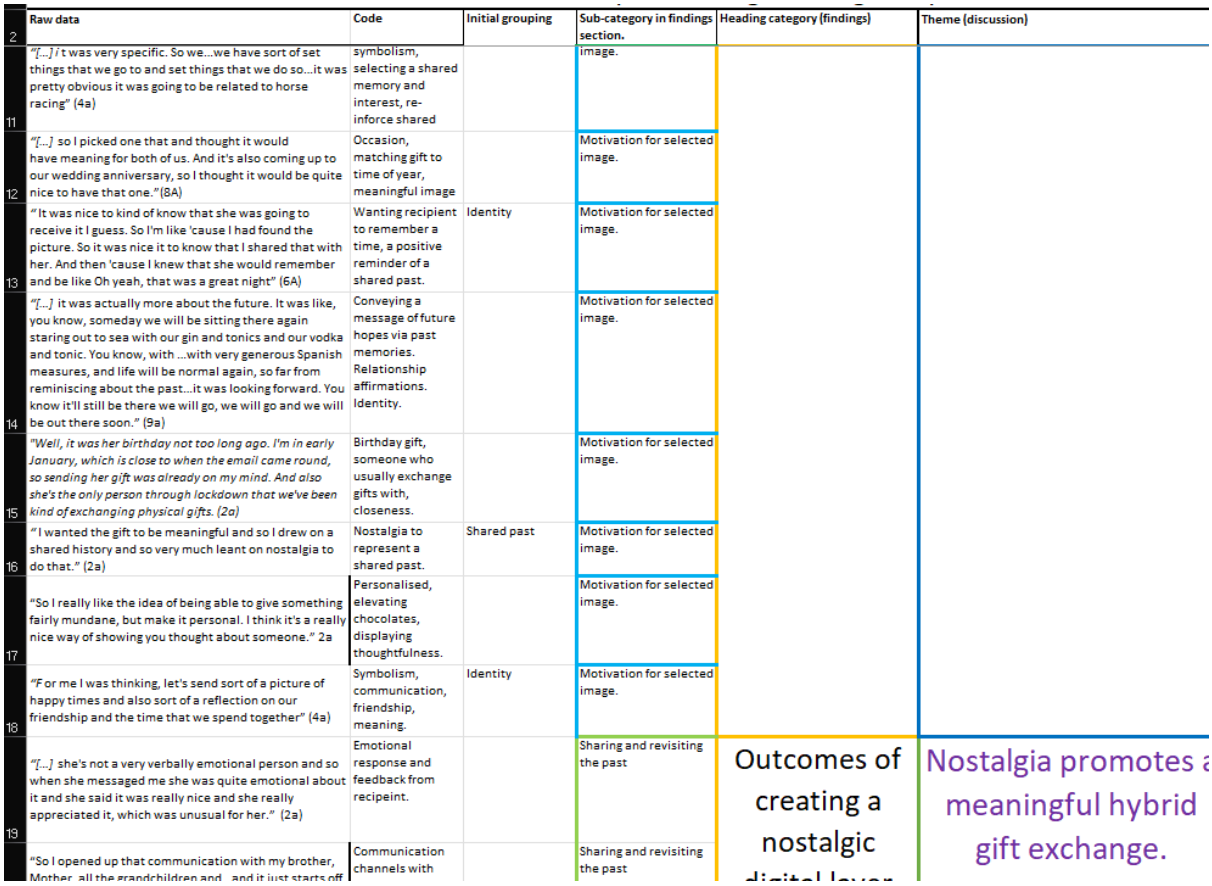
Participants	Insight	Quotes
1A, 2A, 4a,5a,6a, 7a, 8a, 9a	Creating the gift	"so I went through 10 years of photos all the way back to college and I watched us grow up together. And have a lot of 1st experiences together and. it got me reflecting on all of that and how much of a great companion she's been and how she's really been a rock. She's been there for me consistently." (2A) "I picked that photo before and decided about the link with the chocolates but then I saw that one of the chocolates had champagne in it and then that tide in with me pouring the champagne" (4A) "I wanted to find something from a long time ago and I so I had to go into the loft and found my photographs all buried at the bottom of all sorts of

2. Reflections experienced

Participant	Insight	Quotes
1b, 2b, 3b,4,5b,6b	Reflections	*"So it was a picture of us in my granny's house pre pandemic. So we were all like sitting and like had our arms around each other. So I mean I first of all like when I seen it I was like oh that's so cute. So I felt happy but then it was sort of like a little bit of like not like homesick, but like a little bit of sadness because obviously we can't do that. So yeah, it was mostly mostly good, but at the same time, like, oh wish we could that again."* (1b) *"So it reminded me of like this Christmas and I was sort of appreciative of getting to see some people over Christmas and then I sort of missed and it made me nostalgic of older Christmases*

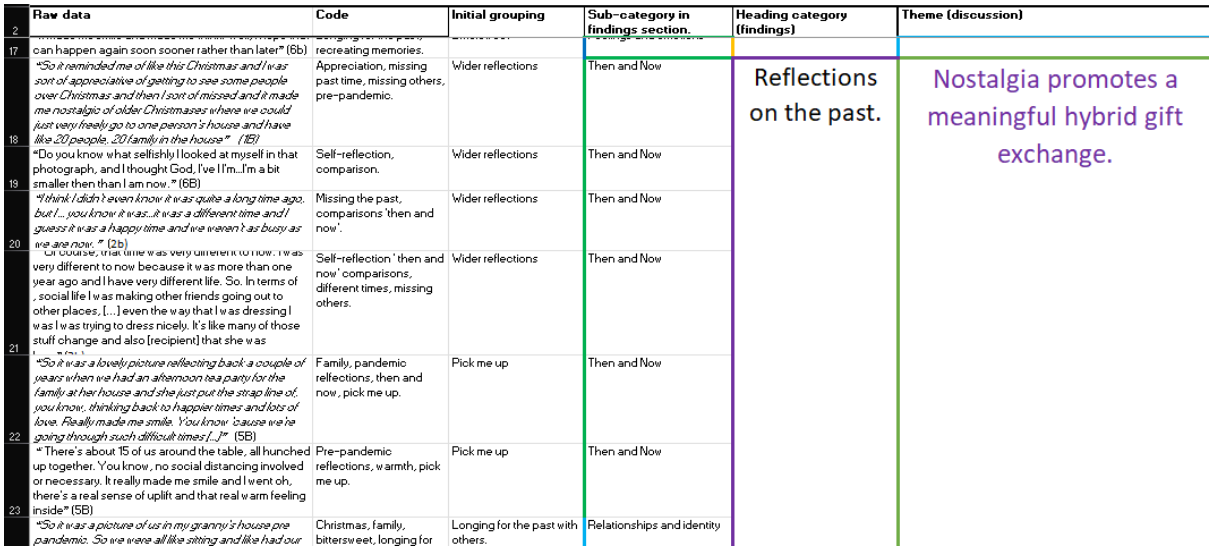
3. Initial grouping and theming.

Giver



	Raw data	Code	Initial grouping	Sub-category in findings section.	Heading category (findings)	Theme (discussion)
11	"[...] it was very specific. So we...we have sort of set things that we go to and set things that we do so...it was pretty obvious it was going to be related to horse racing" (4a)	symbolism, selecting a shared memory and interest, re-inforce shared		image.		
12	"[...] so I picked one that and thought it would have meaning for both of us. And it's also coming up to our wedding anniversary, so I thought it would be quite nice to have that one."(8A)	Occasion, matching gift to time of year, meaningful image		Motivation for selected image.		
13	" It was nice to kind of know that she was going to receive it I guess. So I'm like 'cause I had found the picture. So it was nice it to know that I shared that with her. And then 'cause I knew that she would remember and be like Oh yeah, that was a great night" (6A)	Wanting recipient to remember a time, a positive reminder of a shared past.	Identity	Motivation for selected image.		
14	"[...] it was actually more about the future. It was like, you know, someday we will be sitting there again staring out to sea with our gin and tonics and our vodka and tonic. You know, with ...with very generous Spanish measures, and life will be normal again, so far from reminiscing about the past....it was looking forward. You know it'll still be there we will go, we will go and we will be out there soon." (9a)	Conveying a message of future hopes via past memories. Relationship affirmations. Identity.		Motivation for selected image.		
15	*"Well, it was her birthday not too long ago. I'm in early January, which is close to when the email came round, so sending her gift was already on my mind. And also she's the only person through lockdown that we've been kind of exchanging physical gifts. (2a)*	Birthday gift, someone who usually exchange gifts with, closeness.		Motivation for selected image.		
16	" I wanted the gift to be meaningful and so I drew on a shared history and so very much leant on nostalgia to do that." (2a)	Nostalgia to represent a shared past.	Shared past	Motivation for selected image.		
17	"So I really like the idea of being able to give something fairly mundane, but make it personal. I think it's a really nice way of showing you thought about someone." 2a	Personalised, elevating chocolates, displaying thoughtfulness.		Motivation for selected image.		
18	"For me I was thinking, let's send sort of a picture of happy times and also sort of a reflection on our friendship and the time that we spend together" (4a)	Symbolism, communication, friendship, meaning.	Identity	Motivation for selected image.		
19	"[...] she's not a very verbally emotional person and so when she messaged me she was quite emotional about it and she said it was really nice and she really appreciated it, which was unusual for her." (2a)	Emotional response and feedback from recipeint.		Sharing and revisiting the past	Outcomes of creating a nostalgic	Nostalgia promotes a meaningful hybrid gift exchange.
	"So I opened up that communication with my brother, Mother, all the grandchildren and , and it just starts off	Communication channels with		Sharing and revisiting the past		

Recipient



	Raw data	Code	Initial grouping	Sub-category in findings section.	Heading category (findings)	Theme (discussion)
17	can happen again soon sooner rather than later" (6b)	recreating memories.				
18	*"So it reminded me of like this Christmas and I was sort of appreciative of getting to see some people over Christmas and then I sort of missed and it made me nostalgic of older Christmases where we could just very freely go to one person's house and have like 20 people, 20 family in the house" (1B)*	Appreciation, missing past time, missing others, pre-pandemic.	Wider reflections	Then and Now	Reflections on the past.	Nostalgia promotes a meaningful hybrid gift exchange.
19	"Do you know what selfishly I looked at myself in that photograph, and I thought God, I've I I'm...I'm a bit smaller then than I am now." (6B)	Self-reflection, comparison.	Wider reflections	Then and Now		
20	*"I think I didn't even know it was quite a long time ago, but I... you know it was...it was a different time and I guess it was a happy time and we weren't as busy as we are now."* (2b)	Missing the past, comparisons 'then and now'.	Wider reflections	Then and Now		
21	"Of course, that time was very different to now. I was very different to now because it was more than one year ago and I have very different life. So. In terms of , social life I was making other friends going out to other places, [...] even the way that I was dressing I was I was trying to dress nicely. It's like many of those stuff change and also [recipient] that she was	Self-reflection ' then and now' comparisons, different times, missing others.	Wider reflections	Then and Now		
22	*"So it was a lovely picture reflecting back a couple of years when we had an afternoon tea party for the family at her house and she just put the strap line of, you know, thinking back to happier times and lots of love. Really made me smile. You know 'cause we're going through such difficult times [...]"* (5B)	Family, pandemic relfections, then and now , pick me up.	Pick me up	Then and Now		
23	" There's about 15 of us around the table, all hunched up together. You know, no social distancing involved or necessary. It really made me smile and I went oh, there's a real sense of uplift and that real warm feeling inside" (5B)	Pre-pandemic reflections, warmth, pick me up.	Pick me up	Then and Now		
	"So it was a picture of us in my granny's house pre pandemic. So we were all like sitting and like had our	Christmas, family, bittersweet, longing for	Longing for the past with others.	Relationships and identity		

4. Defining, naming, and organising themes.

Giver

The process of creating a nostalgic digital layer

- *Searching for a nostalgic memory.*
- *Motivation for the selected image.*

Outcomes of creating a nostalgic digital layer

- *Sharing and revisiting the past.*
- *Personal reflections.*

Digitally presenting a nostalgic memory

- *Anticipation and reveal.*
- *Perceptions on physical and digital.*

Receiver

Receiving a nostalgic digital layer

- *Initial reactions.*
- *Feelings and emotions.*

Reflections on the past

- *'Then and now'.*
- *Relationships and identity.*

Perspectives on hybridity

- *Perceived value of the gift.*
- *Viewpoints on physical and digital.*
- *Lasting effects*

Appendix C

The Tailored Gifting Study Appendices

C.1 The Tailored Gifting Study Recipient Demographic Form

ensure any potential allergies or concerns are picked up on.

If you have any questions please feel free to contact the email below:

Rebecca.Gibson@nottingham.ac.uk

I will be be in contact soon.

Thank you.

1. Please enter your full name.

Enter your answer

2. Do you have any known allergies to foods/products/chemicals?

- ○ Yes
- ◉ No

3. Are you happy to consume foods which have been packed in an environment that handles dairy products and nuts?

- ○ Yes
- ○ No

4. Do you or does someone living with you have any additional health conditions that might influence your ability to take part in this study?

- ○ Yes
- ○ No

5. Do you consider yourself high risk during the pandemic?

- ○ Yes

6. Do you have access to the internet and a smart phone?

- ◯ Yes
- ◯ No

7. Is it safe for you to receive a package through Royal Mail during the pandemic?

- ◯ Yes
- ◯ No

8. What age group do you belong to?

- ◯ 18-24
- ◯ 25-34
- ◯ 35-44
- ◯ 45-54
- ◯ 55-64
- ◯ 65+

9. Please select an option below:

- ◯ I would like to be contacted only if I pass the screening.
- ◯ I would like to be contacted regardless of the outcome.

10. Please enter a contact email address

Enter your answer

11. I understand that taking part in this study will require me to take part in an individual online interview for 30mins.

- ◯ Yes
- ◯ No

12. Are you based in the UK?

- ◯ Yes
- ◯ No

Submit

C.2 The Tailored Gifting Study Information Sheet

PROJECT INFORMATION



University of Nottingham
UK | CHINA | MALAYSIA

Date: 21/01/2022

Project: Presenting Personal Nostalgic Media with Tailored Physical Gifts

School of Computer Science Ethics Reference: CS-2021-R27

Funded by: Horizon Centre for Doctoral Training

Purpose of the research.

This study aims to investigate evoking nostalgia through hybrid gifts. Hybrid gifting is defined as taking elements from both physical and digital gifting to create a single gift. Specifically, this study aims to uncover what types of 'tailored' physical gifts are paired with nostalgic digital media e.g., photographs. The premise of the study centres around pairs of participants with one gift-giver and recipient in each.

The study is entirely online with gift-givers creating a hybrid gift using a website, which will be assembled and shipped to their chosen recipient. We aim to capture experiences through individual semi-structured interviews with recipients and gift-givers. All interviews will be carried out online using university-approved services such as, Microsoft Teams. The study will contribute to emerging gift-giving literature within human-computer interaction.

Nature of participation.

Your participation is voluntary and to participate you (the participant) should read and sign a consent form. Once you have understood the nature of your participation and we have answered all your questions, if any, you will be able to participate.

Participant engagement

- Filling out an online screening form – **for gift recipients only.**
- Receiving, reading, signing and returning a consent form online.
- Searching for a physical gift to send online – **for gift-givers only.**
- Uploading data to present a nostalgic memory E.g., Image, text notes, YouTube link to music – **for gift-givers only.**
- Provided a postal address and receiving a gift – **for gift recipients only.**
- Participate in one online interview for 30 minutes – **gift recipient and gift giver separately**
- Reflect on your experience creating or receiving a gift.

Benefits and risks of the research.

Your participation will help us to understand evoking nostalgia through digital media in hybrid gifts. This understanding can contribute to the creation of prototypes and help us to identify opportunities to integrate nostalgic digital layers into a commercial environment. You will get to either create a hybrid gift for a friend/family member, or you will receive a gift from friends/family.

There are risks of potentially feeling upset when reflecting on your prior lived experiences, although we only encourage you to share what you feel comfortable with. Further, if you are a gift recipient in your pair, your gift-giver may select a consumable product. We will diligently ask of any allergies or issues with receiving these types of products during the screening process. Due to Covid-19 we will package any gifts in a clean environment, and we ask when receiving a gift, you wash your hands before opening, to mitigate any potential transmission.

Use of your data.

Only the research team (academic supervisors and student) will be authorized to access the original raw collected data. Only the research team will have access to non-anonymised data, such as audio of the interviews. Only anonymized data and processed data (i.e. transcripts of interviews that do not contain any personally identifiable information) will be used to support a research paper/presentations/thesis. All the data will be stored on a secure digital repository provided by the University of Nottingham. We will use pseudonyms in the report and any other written document.

Personal data collected will be held in a secure and safe manner in accordance with the Data Protection Act 2018. However, no computer system is perfectly secure and it is always possible that a third party might gain unauthorised access to the collected data.

Future use of your data. Your data may be archived and reused in future for purposes that are in the public interest, or for historical, scientific or statistical purposes.

Procedure for withdrawal from the research You may withdraw from the study at any time and do not have to give reasons for why you no longer want to take part. If you wish to withdraw please contact the researcher who gathered the data. If you receive no response from the researcher please contact the School of Computer Science's Ethics Committee.

This research is being conducted by a researcher in the Horizon Centre for Doctoral Training. It has been reviewed and approved by the University of Nottingham, School of Computer Science Research Ethics Committee.

If you have questions please talk to a member of the research team, or after the event contact: Rebecca Gibson via the following email: Rebecca.gibson@nottingham.ac.uk

Contact details of the ethics committee. If you wish to file a complaint or exercise your rights you can contact the Ethics Committee at the following address: cs-ethicsadmin@cs.nott.ac.uk

C.3 The Tailored Gifting Study Consent Form

Hello!

Thank you for your interest in taking part in the *Tailored Gifting Study*.

Please fill in your responses to the consent form below, once completed, I will be in contact.

Thanks again for taking part and if you have questions please email rebecca.gibson@nottingham.ac.uk

* Required

1. Taking part in the study *

	Yes	No
A) I have read and understood the project information sheet dated [21/01/2022], or it has been read to me. I have been able to ask questions about the study and my questions have been answered satisfactorily.	○	○
B) I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time,	○	○

without havin g to give a reason.		
C) I understand that in taking part in the study requires me to upload an image and optional text note/YouTub e music link about a past time/memory which will be seen by the researcher. (**If you are the gift giver in your pair)** **OR** I understand that taking part in this study requires me to receive a gift in the post which may be a consumable product. **(if you are the gift recipient in your pair)**	◯	◯
D)) I understand that taking part in the study requires me to provide data and that this will involve images, postal addresses, names, text notes.	◯	◯

	E) I understand that taking part in this study requires participation in an individual online interview with the researcher and **(if you are the gift recipient in your pair)** requires me to provide a postal address which will be seen by the researcher and admin staff.	○	○
	F) I understand that personal data will be deleted 12months after the study and therefore, the QR code containing images/text/YouTube links will no longer scan, although you may screenshot content before this to keep if required.	○	○

2. Use of my data in the study *

	Yes	No
A) I understand that data which can identify me will not be shared beyond the project team (research and academic supervisors).	○	○
B) I agree that the data provided by me may be used for the following purposes: Presentation and discussion of the project and its results in research activities (e.g., in supervision sessions, project meetings, conferences). Publications and reports describing the project and its results. – Dissemination of the project and its results, including publication of data on web pages and databases.	○	○

C) I give permission for my words to be quoted for the purposes described above.	○	○
D) I give permission for my visual image contained in photos or video gathered duri ng the research to be used for the purposes described above. Only after my identity has been protected by blurring my face or not showing my face at all. I give permission for a written description of the photograph/ memory/ physical gift I upload and select.	○	○

3. Reuse of my data *

	Yes	No
A)) I give permission for the data that I provide to be reused		

for the sole purposes of future research and learning, publications, and presentations .	◯	◯
B) I understand and agree that this may involve depositing my data in a data reposito ry, which may be accessed by other researchers	◯	◯

4. Security of my data *

	Yes	No
A) I understand that safeguards will be put in place to protect my identity and my data during the research, and if my data is kept for future use. The safeguards include storin g all my raw data in a secure encrypted system with controlled access provided by	◯	◯

	the University of Nottingham.		
	B) I confirm that a written copy of these safeguards has been given to me in the University 's privacy notice, and that they have been described to me and are acceptabl e to me.	○	○
	C) I understand that no computer system is completely secure and that there is a risk that a third party could obtain a copy of my data.	○	○

5. Copyright *

	Yes	No
A) I give permission for data gathered during this project to be used, copied, excerpted, annotated, displayed and distributed for the purposes to	○	○

which I have consented.

6. Please enter your full name: *

Enter your answer

7. Please enter your initials below to act as an electronic signature: *

Enter your answer

8. Please enter today's date *

Please input date (dd/MM/yyyy)

Submit

C.4 The Tailored Gifting Study Interview Guide

Part breakdown -gift giver

1.Before starting the session

- Encourage participants to have cameras on.
- Any technical issues or questions.
- Ensure everyone is clear how the data from this interview will be used. E.g., written descriptions of images used, maybe images of physical gifts.
- State: You can withdraw at any time without any explanations.
- Are you ok with me recording the session?
- Any questions?
- START RECORDING
- Provide brief background to study here:

"This study forms part of PhD research on hybrid gifting. To recap, hybrid gifting is merging elements from physical and digital gifting to create a single gift. This study specifically is interested in exploring nostalgic media as the digital element. From this work we aim to learn from your experiences, the types of physical gifts and memories that have been selected and the implications of that. Your participation will help us to understand and uncover new knowledge on nostalgic hybrid gifts."

Informal- remember to state no right or wrong answers.

[GIFTING]

1. Before we begin with the interview questions can you tell me a bit about yourself perhaps what you enjoy doing? Any profession or previous professions? Do you normally send a lot of gifts?
2. Can you explain your experience of creating this gift? How did you find it?

- Who did you select to gift to and why?
- What physical gift did you select and why? (RQ1)
- What memory did you represent and why?
- What data did you use to represent the memory? E.g., photos, text, music etc.
- How did you feel creating the gift? (RQ2)
- Did you / do you have any feelings about your recipient receiving this gift? (RQ3)

3. There was a budget of £25 is there a reason why you spent all of this OR below this budget?
4. How did you find searching for a 'tailored' gift for your recipient? Was it easy/difficult?
5. Did you have a memory in mind before the idea for the physical gift or vice versa?

[NOSTALGIA]

1. Did you reflect on any specific memories when creating the gift? and did you feel any emotions either positive or negative? [13, 48]

2. *Read the following to participant: Cambridge dictionary defines nostalgia as "a feeling of pleasure and sometimes slight sadness at the same time as you think about things that happened in the past:" [42]* **Based off this definition do you often feel nostalgic?**
3. How did you want your recipient to feel when they received (or receive) the gift? and have you contacted them or have they contacted you about the gift?
4. Did you speak to anyone else about the gift?

[TECHNICAL/HYBRIDITY]

1. Was there any part of this gift you were (are) looking forward to your recipient opening?
2. Do you think sending the nostalgic digital content and the physical gift together had any consequences either positive or negative?
3. What do you think of the hybrid model of gifting? Do you foresee any downfalls or benefits to gifting this way?
4. In future would you like to experience receiving a nostalgic hybrid gift like the one you created? Or consider sending something like this again to someone in the future? If so who and why?
5. Are there any other types of physical objects that could be paired with nostalgic digital content?

6. Closing questions and remarks

- Ask participants for any final questions or points they have.
- A few demographic questions are age group and preferred pronouns you belong to? You do not have to answer these if you're uncomfortable doing so.
- End recording.
- Thanks to participants.

Part breakdown – gift recipient

1.Before starting the session

- Encourage participants to have cameras on.
- Any technical issues or questions.
- Ensure everyone is clear how the data from this interview will be used. E.g., written descriptions of images used, maybe images of physical gifts.
- State: You can withdraw at any time without any explanations.
- Are you ok with me recording the session?
- Any questions?
- START RECORDING
- Provide brief background to study here:

"This study forms part of PhD research on hybrid gifting. To recap, hybrid gifting is merging elements from physical and digital gifting to create a single gift. This study specifically is interested in exploring nostalgic media as the digital element. From this work we aim to learn from your experiences, the types of physical gifts and memories that have been selected and the implications of that. Your participation will help us to understand and uncover new knowledge on nostalgic hybrid gifts."

Informal- remember to state no right or wrong answers.

2.Reciving a hybrid gift

1. Ask participant "Tell me a bit about yourself" e.g., hobby, profession, age, do they usually send/receive a lot of gifts
2. Tell me about your experience of receiving the gift.

Follow up questions:

3. What was your initial reaction to the gift?
4. Who is the gift-giver to you?
5. How did you feel when you knew the gift was shipped? RQ3
6. When did you open the gift? and in what order did you unwrap the elements?
7. Is there anything about this gift that you enjoyed? RQ3
8. Did you feel like this gift reflected yourself or your gift-giver in any way? If so how or what part? RQ2
9. Did you or are you planning on contacting your gift-giver about this gift?
10. Have you mentioned this gift to anyone external to the exchange?

3.Nostalgia

Read the following to participant: Cambridge dictionary defines nostalgia as "a feeling of pleasure and sometimes slight sadness at the same time as you think about things that happened in the past:"

5. What are your thoughts on that definition of nostalgia?
6. Did you reflect on the past at all during this gift exchange? If so reflection on what? People/objects/places/events?
7. Did you feel any positive or negative emotions whilst opening / after opening the gift? RQ2
8. Are you someone who often feels nostalgic?
9. Did you recall any memories due to receiving this gift? if so what type of memory? RQ2
10. Why do you think your gift-giver selected that gift/memory? RQ2

4. Hybridity

1. Do you think the physical object and nostalgic memory went together? RQ1
2. Was there any part of the gift you preferred? RQ3 DID YOU NEED BOTH PARTS?
3. Would you like to send a hybrid gift to someone? If yes would evoking emotion in the recipient be a consideration?
4. What thoughts do you have on different technology to display the digital content you received?

5. Do you think a nostalgic digital memory could go with any other physical products? RQ1
6. Do you have any plans with what you are going to do with your gift now? RQ3

5. Closing questions and remarks

- Ask participants for any final questions or points they have.
- A few demographic questions are age group and gender you belong to? You do not have to answer these if you're uncomfortable doing so.
- End recording.
- Thanks to participants.

C.5 The Tailored Gifting Study Thematic Analysis Example

Initial coding examples

Each interview was coded separately, with each participant being allocated a different colour.

	Yeah. And he's one of the key is one of the cutest pictures I remember of her when she was little and and. Yeah, of course, that makes you feel nostalgic. This morning brings a tear to my eye, I think. Where's my little baby gone? You know now, because she's. She's 11, looks about 15.	Wider reflections o	9_9A_200
Yeah.			9_9A_201
	Umm.		9_9A_202
	Yeah, I've seen your school.		9_9A_203
	She's still very young at heart. She just doesn't look young.		9_9A_204
Umm.			9_9A_205
Yeah.			9_9A_206
Yeah.			9_9A_207
	If you know what I mean. So yeah, that makes you feel that makes you feel nostalgic. Yeah, definitely. So you can so definitely photographs do.	Photographs being	9_9A_208

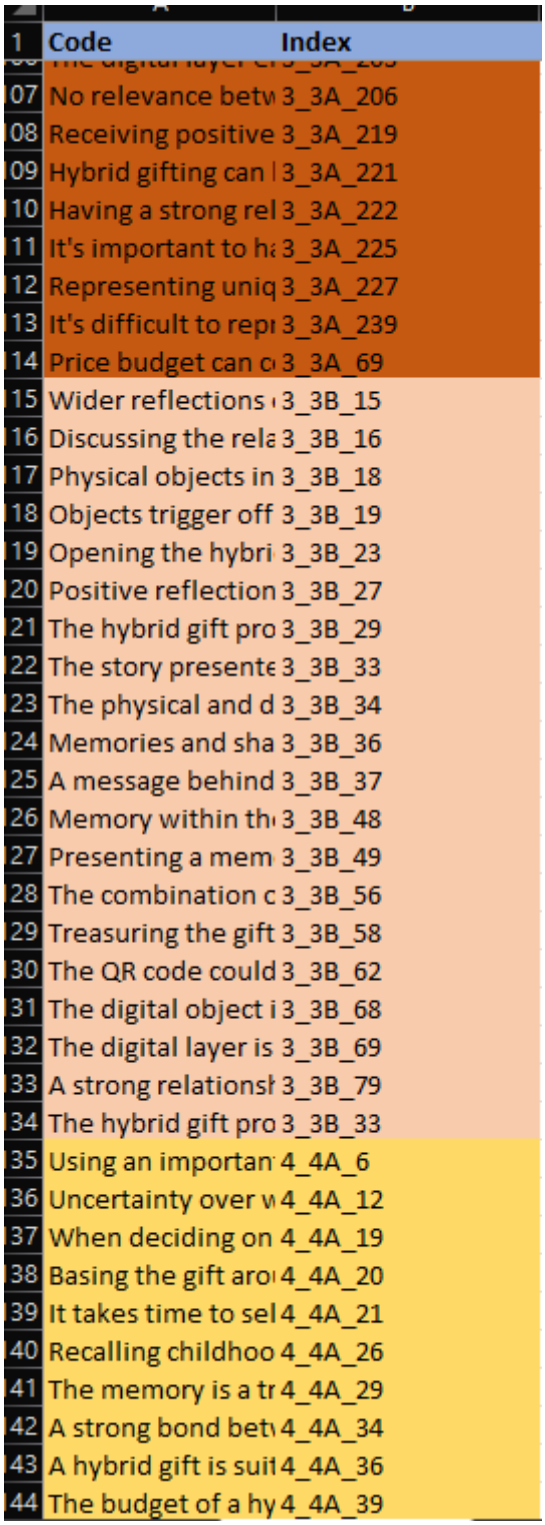
189		**Like, I think there's a lot more to it, so it I didn't know how to word it, but it was when.**	Accessing the digtial laye	7_7B_189
190	And.			7_7B_190
191		**My mum wrote on that QR code like on the thing she wrote like one simple sentence, but then that one sentence actually bought back.**		7_7B_191
192		**A lot of memories I could bought back all these memories of when we, me and my dog didn't get like I was scared of him and then I wasn't scared of him like that sentence in itself. Bought back a lot. So I don't. I don't really think it's it's.**		7_7B_192
193		**I don't think there's anything wrong with the QR code. I just think that whoever's writing it.**	For a HG it's not the quan	7_7B_193
194		Just needs to be.		7_7B_194
195	Umm.			7_7B_195
		Like like **quite specific with the memory that they're trying to get across, but then as soon as I think that they've got that, I think for the person that's receiving the gift, everything will just come come back like like it did for me.** Like it was such a	A recipient experience is t	7_7B_196

Reflexivity – throughout the process I considered my assumptions and starting point, with reminders of the analysis process.

	A	B
2	**What are my assumptions?**	That everyone sends and recieves gifts or has had experiences with gifting. Most people know what nostalgia is and have felt those emotions before. None of the particiapnts have had experience with hybrid gifts before. Gift-givers in the pair all watched the intro video in their own time and have familiarised themselves with some key terminology. I'm assuming participants have done online shopping before for a gift.
3	**What is my starting point?**	I have media which I can feel nostalgic about. I have knowledge on nostalgia within hybrid gift exchanges. I have close family/friends who I could select a tailored gift for. I have knowledge on how technologies work and can be used within a gift exchange. I'm aware of gifting literature and underlying motivations to send, recieve, and reciprocate.
4	Reflections throughout the initial coding	
5	Within interviews participants realised how nostalgic	2A
6	People want to connect with others via sharing mem	7B
7		
8	Initial coding process / reminders **Braun & Clarke 2006, 2019, 2022**	
9	Themes do not emerge	
10	More instances does not equal more important	
11	Inductive vs deductive	
12	Progress from descriptive - ideas, assumptions, and conceptualisations	
13	**Find repeated patterns of meaning**	
14	Creative, reflexive, and subjective	
15	Themes are stories	
16	TA is not static	
17	Be recursive	

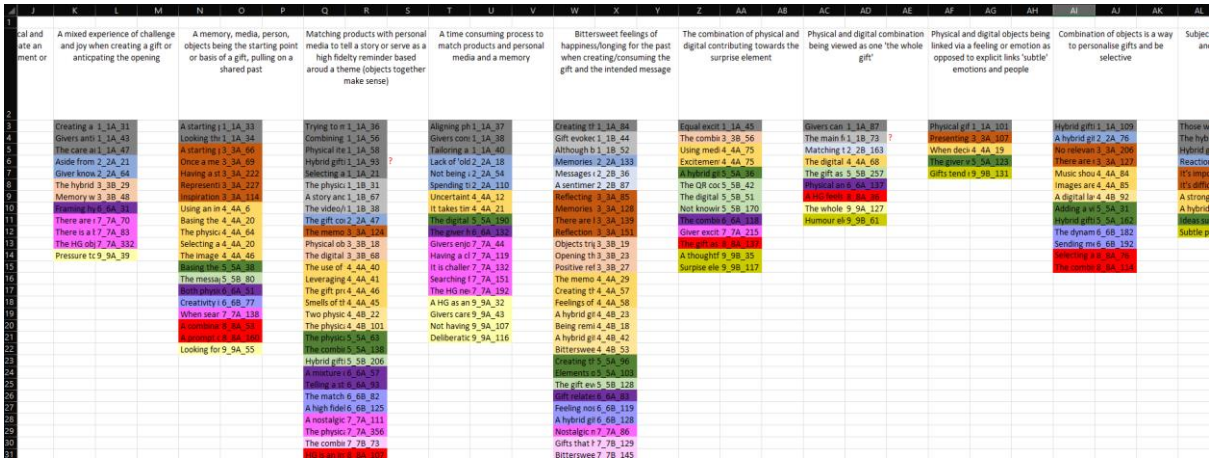
Initial grouping process

All codes were brought into one place.

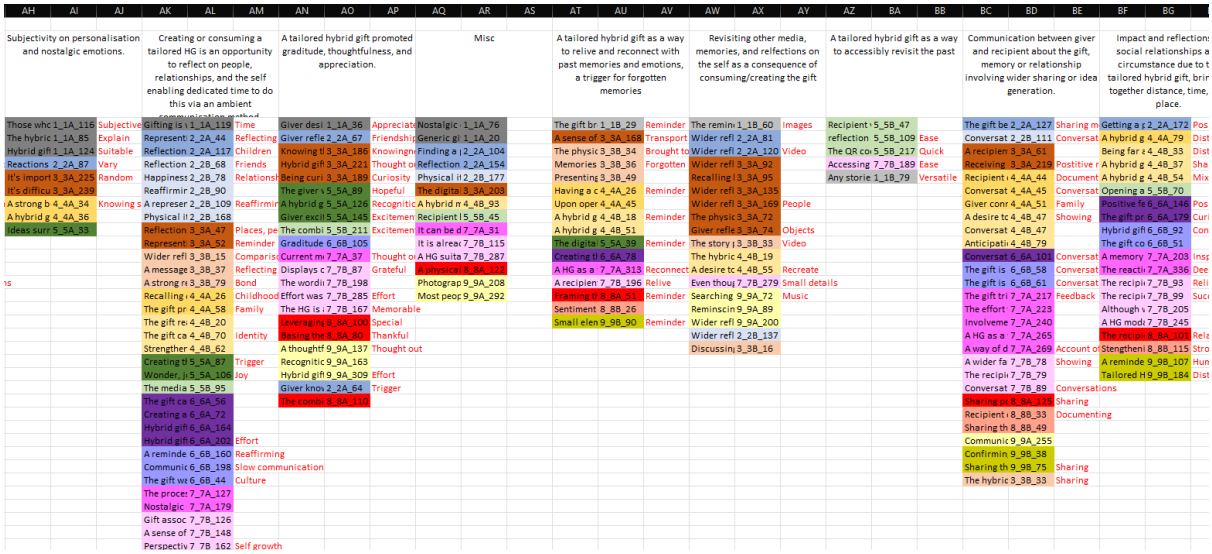


	Code	Index
107	No relevance betv	3_3A_206
108	Receiving positive	3_3A_219
109	Hybrid gifting can	3_3A_221
110	Having a strong rel	3_3A_222
111	It's important to ha	3_3A_225
112	Representing uniq	3_3A_227
113	It's difficult to repr	3_3A_239
114	Price budget can c	3_3A_69
115	Wider reflections	3_3B_15
116	Discussing the rela	3_3B_16
117	Physical objects in	3_3B_18
118	Objects trigger off	3_3B_19
119	Opening the hybri	3_3B_23
120	Positive reflection	3_3B_27
121	The hybrid gift pro	3_3B_29
122	The story presente	3_3B_33
123	The physical and d	3_3B_34
124	Memories and sha	3_3B_36
125	A message behind	3_3B_37
126	Memory within th	3_3B_48
127	Presenting a mem	3_3B_49
128	The combination c	3_3B_56
129	Treasuring the gift	3_3B_58
130	The QR code could	3_3B_62
131	The digital object i	3_3B_68
132	The digital layer is	3_3B_69
133	A strong relationsh	3_3B_79
134	The hybrid gift pro	3_3B_33
135	Using an importan	4_4A_6
136	Uncertainty over w	4_4A_12
137	When deciding on	4_4A_19
138	Basing the gift aro	4_4A_20
139	It takes time to sel	4_4A_21
140	Recalling childhoo	4_4A_26
141	The memory is a tr	4_4A_29
142	A strong bond betv	4_4A_34
143	A hybrid gift is suit	4_4A_36
144	The budget of a hy	4_4A_39

Code were then put into broad categories

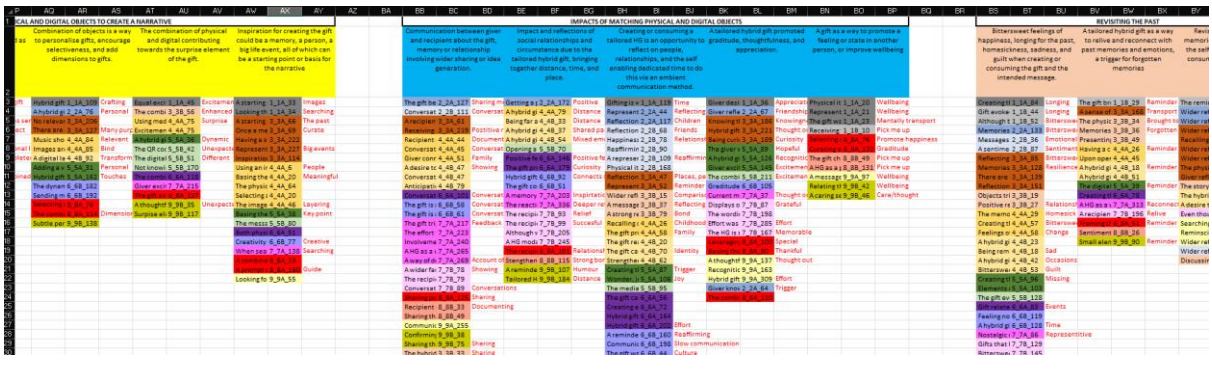


Comments were made on the essence of the codes in red text and some codes were moved into different groups.



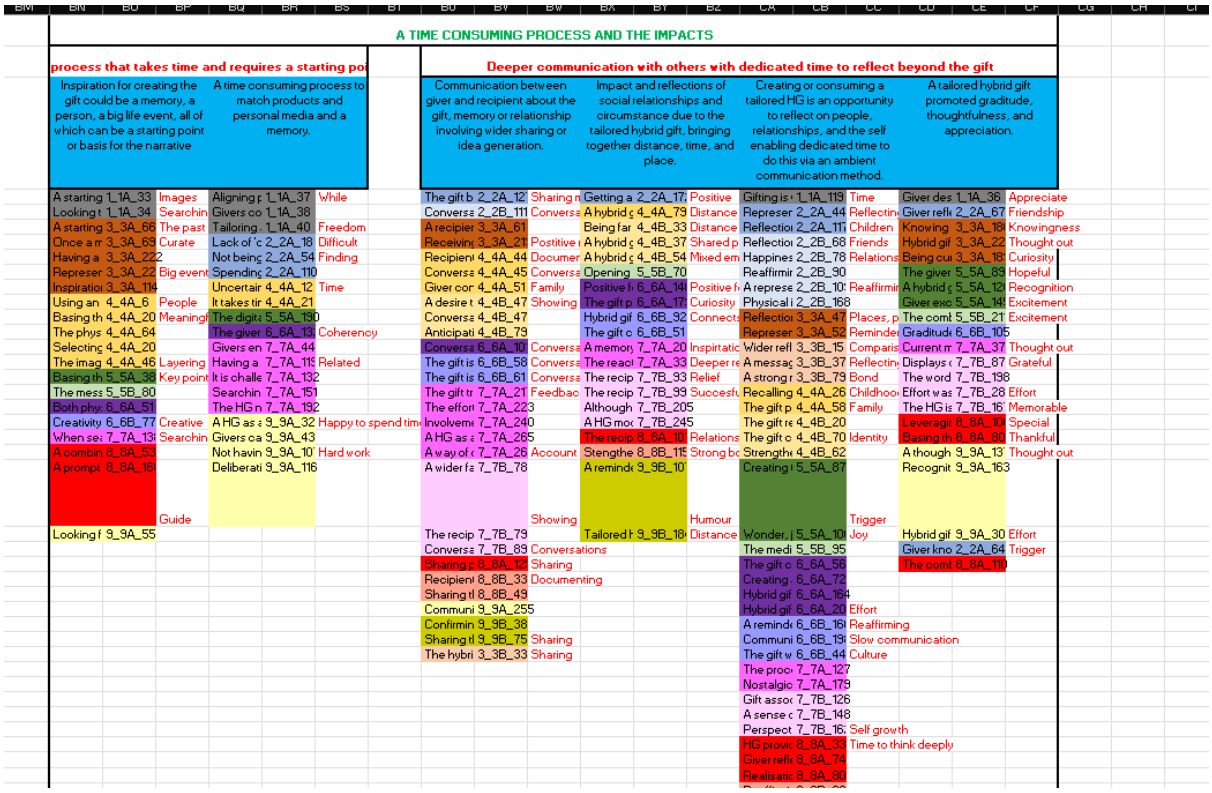
Re-grouping

Codes were then re-grouped iteratively.



Generating themes

Themes were then generated to contain subthemes.



A TIME CONSUMING PROCESS AND THE IMPACTS

process that takes time and requires a starting poi

Inspiration for creating the gift could be a memory, a person, a big life event, all of which can be a starting point or basis for the narrative

A time consuming process to match products and personal media and a memory.

Deeper communication with others with dedicated time to reflect beyond the gift

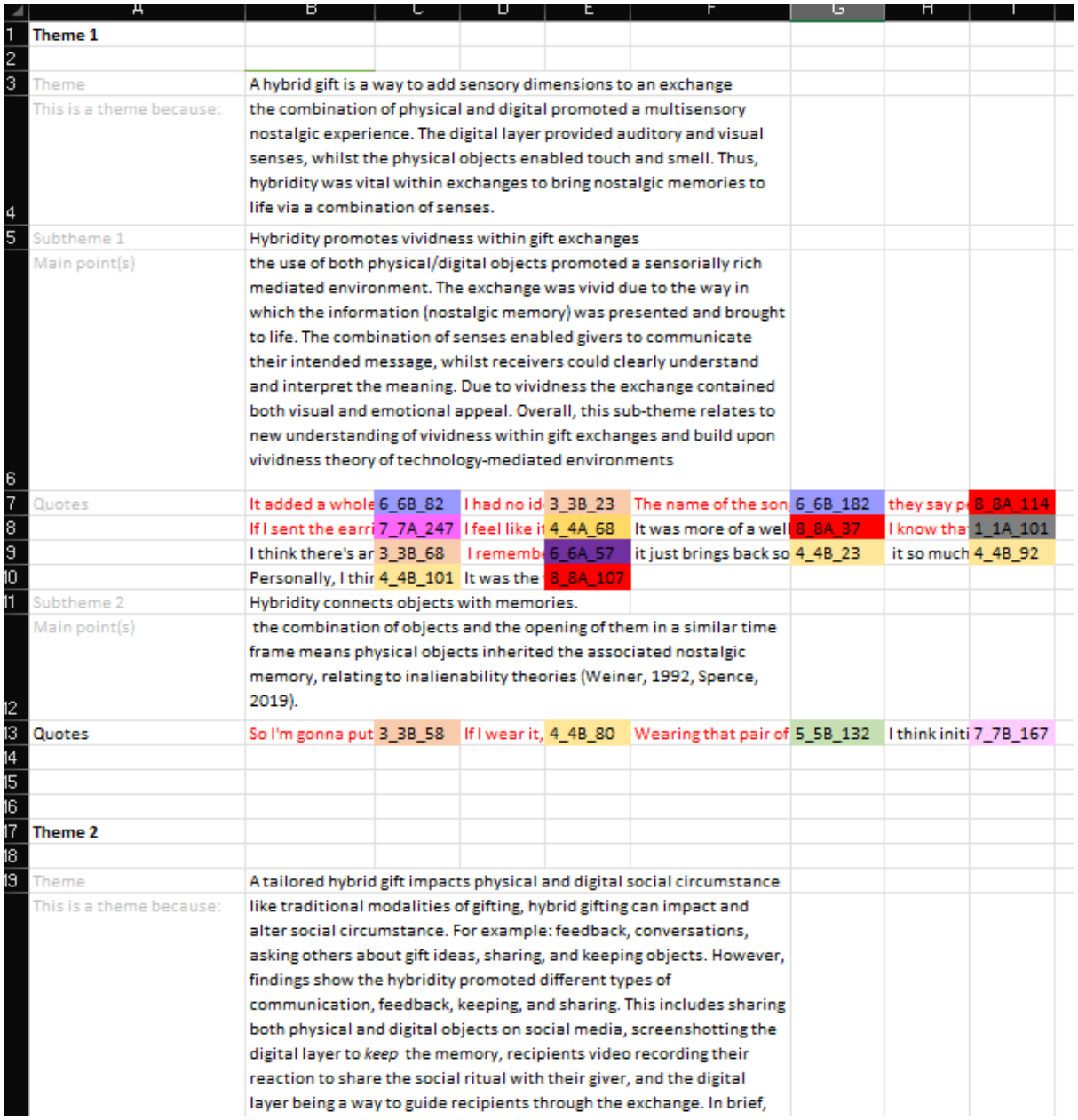
Communication between giver and recipient about the gift, memory or relationship involving wider sharing or idea generation.

Impact and reflections of social relationships and circumstance due to the tailored hybrid gift, bringing together distance, time, and place.

Creating or consuming a tailored HG is an opportunity to reflect on people, relationships, and the self enabling dedicated time to do this via an ambient communication method.

A tailored hybrid gift promoted graditude, thoughtfulness, and appreciation.

Themes were then defined further and re-named as needed.



	A	B	C	D	E	F	G	H	I
1	**Theme 1**								
2									
3	Theme	A hybrid gift is a way to add sensory dimensions to an exchange							
4	This is a theme because:	the combination of physical and digital promoted a multisensory nostalgic experience. The digital layer provided auditory and visual senses, whilst the physical objects enabled touch and smell. Thus, hybridity was vital within exchanges to bring nostalgic memories to life via a combination of senses.							
5	Subtheme 1	Hybridity promotes vividness within gift exchanges							
6	Main point(s)	the use of both physical/digital objects promoted a sensorially rich mediated environment. The exchange was vivid due to the way in which the information (nostalgic memory) was presented and brought to life. The combination of senses enabled givers to communicate their intended message, whilst receivers could clearly understand and interpret the meaning. Due to vividness the exchange contained both visual and emotional appeal. Overall, this sub-theme relates to new understanding of vividness within gift exchanges and build upon vividness theory of technology-mediated environments							
7	Quotes	It added a whole	6_6B_82	I had no id	3_3B_23	The name of the son	6_6B_182	they say p	8_8A_114
8		If I sent the earri	7_7A_247	I feel like it	4_4A_68	It was more of a well	8_8A_37	I know tha	1_1A_101
9		I think there's ar	3_3B_68	I rememb	6_6A_57	it just brings back so	4_4B_23	it so much	4_4B_92
10		Personally, I thir	4_4B_101	It was the	8_8A_107				
11	Subtheme 2	Hybridity connects objects with memories.							
12	Main point(s)	the combination of objects and the opening of them in a similar time frame means physical objects inherited the associated nostalgic memory, relating to inalienability theories (Weiner, 1992, Spence, 2019).							
13	Quotes	So I'm gonna put	3_3B_58	If I wear it,	4_4B_80	Wearing that pair of	5_5B_132	I think initi	7_7B_167
14									
15									
16									
17	**Theme 2**								
18									
19	Theme	A tailored hybrid gift impacts physical and digital social circumstance							
	This is a theme because:	like traditional modalities of gifting, hybrid gifting can impact and alter social circumstance. For example: feedback, conversations, asking others about gift ideas, sharing, and keeping objects. However, findings show the hybridity promoted different types of communication, feedback, keeping, and sharing. This includes sharing both physical and digital objects on social media, screenshotting the digital layer to *keep* the memory, recipients video recording their reaction to share the social ritual with their giver, and the digital layer being a way to guide recipients through the exchange. In brief,							

An overview of themes and sub-themes after the thematic analysis process.

1			
2	Theme 1:	A hybrid gift is a way to add sensory dimensions to an exchange	**Multi-sensory experience**
3	Subtheme1	Hybridity promotes vividness within gift exchanges	
4	Subtheme2	Hybridity connects objects with memories	
5			
6	Theme 2:	A tailored hybrid gift impacts social circumstance	**Social and emotional impacts**
7	Subtheme1	A thoughtful combination of physical/digital objects promotes ownership	
8	Subtheme2	Relationships are strengthened and reaffirmed via hybrid gift	
9	Subtheme3	Desired emotional impacts can be communicated via hybrid gift	
10			
11	Theme 3:	Gift motivation and preparation is guided by hybridity	**Selecting and motivation for the gift**
12	Subtheme1	The novelty of hybridity contributes to uncertainty	
13	Subtheme2	Thoughtfulness over preference	

Appendix D

The Gift Producer Study Appendices

D.1 The Gift Producer Blank Demographics Form

Producer study demographics

Hello!

Please fill out the below to help us contextualise the work and learn more about your interest within the gifting industry. Anything you enter will be anonymised although we may use a broad description of the types of gifts you produce or have interest in.

Thank you for taking the time to help with this study :)

1. Please enter your name:

Enter your answer

2. Please enter your business name if applicable

Enter your answer

3. Select on of the below that best describes your interactions with technology:

- I use technology everyday (smartphone/laptop/printers etc) and need no help to use it.
- I am confident most of the time with technology but need help sometimes.
- I do not use a smartphone/laptop and would need someone to show me.

4. Do you produce/create/craft/sell products that could be gifts?

- Yes
- No

5. Add a brief description of gifts/products you produce, leave blank if n/a

Enter your answer

6. How long have you been involved in the gifting industry?

Enter your answer

7. Please enter your proffered pronouns below

Enter your answer

8. Please select your relevant age group below

- 18-24
- 15-36
- 37-46
- 47-55
- 56-64
- 65-76
- 77+

9. Please indicate any good dates/times/days for the focus group.

Enter your answer

D.2 The Gift Producer Focus Group Guide

Focus group plan and script *the below wording may change slightly*

Before the session (5 mins)

- Make sure all participants have signed and returned ethics forms/mixed personal data form and demographics.
- Ensure Teams is recording on laptop (video and audio)
- Ensure all participants are made aware of their right to withdraw from the focus group at any point.

Part 1- Introduction and Context (10 mins)

- Thanks to the participants.
- Quick Ice breaker and get participants to state their name.
- Provide background on why we are studying this area.
- Define key terms (hybrid gifting, gifting, nostalgia, media).
- Demo of scanning a nostalgic hybrid gift or image showing this.
- Run through of activities for the focus group.
- Any questions from participants.

Part 2- Distilling Findings(30 mins)

- As a group we will look at a case study loosely based off one of the participants from a previous study. We will then unwrap their chosen gift and loosely based nostalgic memory. One participant will unwrap the hybrid gift of chocolates and scan the QR code or this can be done as a group using the researchers phone, it is a QR code that links to a web page and not an application. (5 minutes)
- We will ask producers the following prompts:
  1. Quick sketching activity (5 minutes) – ask participants to sketch or write down what does a hybrid version of their products look like? ***Prompts if needed*** *(what does it look like? Does it use a QR code? How might it feel to unwrap this? What work is involved in producing this?)*

     Take photos of sketches

     Ask participants to share some prompts below if needed: 10 minutes

  2. What are your initial thoughts on both physical and digital parts of the gift?
  3. Do you have any thoughts on how your own products could be made hybrid? Or would you want to?
  4. What do you think about using nostalgia with products?
  5. Do you have any initial concerns/feelings/opinions on this modality of gifting as a producer?

We will then do the same again with another gift, this time an example of the tailored gifting study and a memory loosely based off a participant's experience.

- We will then ask producers the following questions:
  1. Does this feel different to the last gift? if so, how?
  2. Does it change any prior opinions about matching physical products to digital memories?
  3. Any specific 'domain' challenges or opportunities they see?

Break (5/10 mins)

Part 3-Gift Producer Views(30 mins)

- Each participant is given post it notes and explained the process for NGT below:

Table 1. STEPS IN THE NGT

1. Introduction
2. Silent Generation
3. Round Robin
4. Clarification
5. Ranking and Weighting
6. Discussion and Closure

Fig 1. Steps in the NGT for a study with HR professionals [53]

- Participants spend time thinking of potential opportunities of hybrid gifts and framing experiences with nostalgia or other emotions. (5 mins)
- We may display prompts such as: physical products, media, aesthetic, feel, emotions, connections, sadness, processes etc
- Participants then spend time generating potential concerns or challenges hybrid gifts and framing experiences with nostalgia or other emotions. (5 mins)
- In turn as a group we will go round and explain opportunities and barriers.
- As a group we will rank the top 5 of both areas. (20 minutes)
- After we will ensure names match the groups accordingly.

Workshop close (5mins)

- Thank participants
- Take pictures of notes/post its
- Stop recording
- Remind participants of their Amazon voucher

Focus group timings plan:

Part 0

set out resources.

take pics of resources

ensure teams is recording on laptop video and audio?

Ensure Dictaphone is recording.

PART 1

14:00-14:10 (10 mins)- General start tea/coffee etc etc

14:10-14:20 (10 mins)- Introduction

PART 2

14:20-14:35 (15 mins)- Both gift examples

14:35-14:50 (15 mins)- Ideation

14:50-14:55 (5 mins)- Reflection

BREAK- take photos

14:55-15:05- (5/10mins)- Break

PART 3

15:05- 15:12- (7 mins)- Generating activity.

15:12-15:19- (7 mins)- Discussion.

15:19- 15:26- (7 mins)- Grouping top 5.

15:26-15:30- (4 mins)- close/take photos

D.3 The Gift Producer Information Sheet and Blank Consent Form

Information sheet:

PROJECT TITLE: Capturing Gift Producer's Perspectives on Hybrid Gifting and Nostalgic Emotions

1. The research
a) Aims and objectives of the research
This study is aimed at capturing opinions, views, and conversation between gift producers who are interested in hybrid products and personalisation using emotions e.g., nostalgia. The aims are: 1. To uncover gift producer opinions on the potential barriers and opportunities of hybrid products with emotional experiences. 2. To understand gift producers' motivations regarding making any of their gifting products hybrid. 3. To promote conversation around previous findings related to hybrid gifting and nostalgia. 4. To capture gift producer viewpoints to contribute towards 'guidelines' or 'considerations'. For this research, hybrid products or gifts are defined as merging physical and digital objects to create a single gift.
b) Funder information
This work is part of the hybrid gifting project and is an ESPRC funded PhD research project: funding number EP/S023305/1
c) Governance
This research has been approved by the School of Computer Science Research Ethics Committee (CS REC), ethics application ID CS-2022-R34.

2. Taking part in the research
This research involves taking part in a 1hour 30minutes in-person focus group. Focus groups will explore the concept of 'hybrid gifting' which is defined as merging physical and digital objects to create a single gift. Specifically, we are interested in your opinions and views on integrating emotions like nostalgia into hybrid gifting products. You will be asked to discuss this topic with fellow gift-producers or those working within the gifting industry. *The structure for taking part is as follows:* - *Complete informed consent form.* - *We will send over a short online demographics form for you to complete.* - *We will be in contact with dates/times/locations of the focus group.* - *Focus group will take place in-person between 3-6 gift producers will be present (you may wish to bring an example of product to produce or sell but is not essential).*

- *The focus group will be split into 3 parts and last 1hr 30minutes with various discussions and activities. (A 5-10-minute break will be included in this).*
- *After participation you will be emailed your £20 Amazon voucher.*

3. Risks of participation

a) Risks

There is always a risk of unauthorised access to data. There are no other risks of taking part in the study, however we recognise that discussion of the topic nostalgia may be unpleasant for some.

Although the aim of the focus group is to learn from your expertise as a gift producer your views and opinions on integrating emotions like nostalgia into hybrid gifting products Please note, it is agreed that any concepts shared within focus groups are thereby "public" and may be reported in papers and exploited by anyone present.

b) Mitigation of risks

See section 5 for the measures we put in place to mitigate the risk of unauthorised access.

4. Purpose of data processing

a) Data collected

We collect the following categories of data during your participation in the research:

Video and audio recording of focus groups, photos of artifacts created in focus groups (sketches, post-it notes), and demographic information (age, profession, pronouns).

b) Specific purposes for which the data are processed

Data collected during the research that identifies you may be:

- Analysed to meet the aims and objectives described in Section 1.
- Reviewed and discussed in supervision sessions between researchers and their supervisors or in research meetings between members of the research team, including project partners.
- If audio recordings are collected during the research, these may be transcribed and **anonymous** quotations of your spoken words may be used in scientific works, including presentations, reports and publications stored in databases and posted online, and in marketing materials that promote the research and its findings.
- Video recordings of the sessions will be used solely to allocate each participant with an ID or pseudonym to match up with text transcripts and will not be shared beyond the immediate research team.
- If visual images that identify you are collected during the research, they may be used in scientific works, including presentations, reports and publications stored in databases and posted online, and in marketing materials that promote the research and its findings; you will **not** be named if visual data is used for these purposes and you may **opt out** in Section 9b. Any photographs containing faces will be blurred to protect identity.
- Demographic information will be used to contextualise the research when writing up. All information will be anonymised and stored on University approved Microsoft Forms.

c) Automated decision-making and profiling
N/A
d) Legal basis for processing your data
We collect personal data under the terms of the University of Nottingham's Royal Charter and in our capacity as a teaching and research body to advance education and learning. We thus process your data on the legal basis that our research is in the public interest, we have legitimate interests and / or that you consent to data processing in freely and voluntarily participating in our research activities.

5. Storage and retention of your data
a) Data protection measures
We put the following organisational and / or technical safeguards in place to protect your data and your identity to the best of our ability: i) All data stored digitally will be encrypted and password protected and all physical data will be stored in a secure location.
b) Retention period
Data protection law allows us to retain personal data for an indefinite period and use it in future for public interest, scientific or historical research purposes or statistical purposes, subject to the implementation of technical and organisational measures that safeguard your data, your legal rights and your freedoms. These safeguards include the storage measures described above to protect your data against unauthorised access, and de-identification (anonymisation or pseudonymisation) of your data wherever possible and practicable. Data that identifies or could identify you will not be made public without your consent.

6. Third party recipients, services and data transfers
a) Project partners
Your data will not be shared with others.
b) Third-party services
N/A
c) Data transfers
Your data will not be transferred to another country.

7. Your legal rights
Data protection rights (Data Protection Act 2018) You have the right: • To be informed about the collection and use of personal data (as per this document). • To access and receive a copy of your personal data, and other supplementary information, on request.

- To object to and restrict data processing if you think we are not complying with data protection law, and to rectify inaccuracies.
- To be forgotten, i.e., to have your personal data erased.
- To data portability and to obtain your data in an accessible and machine-readable format if appropriate, or to transfer your data to another organisation if technically feasible.
- To complain to about the way we process your personal data to our ethics committee (cs-ethicsadmin@cs.nott.ac.uk), our Data Protection Officer (dpo@nottingham.ac.uk) or the Information Commissioner's Office (https://ico.org.uk/make-a-complaint).*

Joint authorship in copyright works (Copyright, Designs and Patents Act 1988)

You may, if you wish, be acknowledged and publicly identified as joint author of the *insert name for the work(s) participants are joint authors of in this research (e.g., the interview recording or video of the involvement in an experiment)*. **Affirming your right to be acknowledged as joint author may affect your anonymity.**

8. Your ethical rights

a) Right to withdraw

You have the right to withdraw from the research at any time without explanation. You also have the right to request that your data be deleted if you do withdraw.

b) Handling of 'mixed' data

If the data is 'mixed' data – i.e., if it involves other people (not including the researchers), e.g., a conversation or video of multi-party interaction – it cannot be deleted unless **all parties** request it. However, any mixed data involving you will be redacted wherever possible, with the exception of scientific works produced prior to your notification of withdrawal.

c) Withdrawal procedure

If you wish to withdraw, please notify ***Rebecca Gibson Rebecca.gibson@nottingham.ac.uk***

If you do not receive confirmation of withdrawal from the research, please email cs-ethicsadmin@cs.nott.ac.uk

* Our DPO's postal address is Data Protection Officer, Legal Services, A5 Trent Building, University of Nottingham, University Park, Nottingham NG7 2RD.

Online consent form:

1. **I consent to participate in the research and my signature or mark confirms the following:**

- I understand the aims and objectives of the research
- I understand what the research requires me to do
- I accept the risks of participation
- I understand what data will be collected and the purposes for which the data will be used
- I understand safeguards will be put in place to protect my data and my legal rights
- I understand I will not be identified unless the use of identifiable data has been requested and I consent to it
- I understand that I can withdraw at any time without explanation
- I have been able to ask questions about the research, my participation, and my data and my questions have been answered satisfactorily
- I agree to participate and my participation is voluntary
- I understand that images may be taken within the focus group
- I agree to a written description of the types of gifts I produce/sell/craft for any write ups of the work and understand my business name will not be used in any publications
- It is agreed that any concepts shared are thereby "public" and may be reported in papers and exploited by anyone present

*

( ) Yes

( ) No

2. **Opt out.** I do not consent to use of my visual image in scientific works or materials that promote the research and its results. Please enter your signature below if you wish to opt out, if not please leave blank or put n/a

Enter your answer

3. **c) Opt in.** I wish to affirm my right to be acknowledged as joint author of original works created in this research and understand this may affect my anonymity

   Joint authorship applies to all forms in which an original work exists (e.g., audio recording, transcript, research reports, presentations, publications, etc), which means that joint authors should be acknowledged in all forms in which an original work exists. Add the names of any participants who do affirm their right to be acknowledged as joint author in the **Acknowledgement section** of any written works.

   Please enter your signature below if you wish to opt in, if not please leave blank or put n/a

   Enter your answer

4. Please enter your initials below to act as an electronic signature: *

   Enter your answer

5. Please enter your full name: *

   Enter your answer

6. Please enter today's date *

   Please input date (dd/MM/yyyy)

Submit

Never give out your password. Report abuse